MFG: ELI BRIDGE COMPANY
NAME: HY 5 FERRIS WHEEL
TYPE: NON-KIDDIE

Here are some safety rules for HY-5-II operators:

1. Completely inspect and test run the Wheel before each operating period

2. Assist patrons on and off the Wheel when necessary.

3. Be sure the handlebars are properly fastened before starting operations, and that the seat hanger castings on the ends of the seats are each equipped with seat locks.

4. If the Wheel is being misused by patrons, shut the Wheel down until the condition is corrected.

5. Never let anyone enter the stairs while the Wheel is turning. Anyone climbing the stairs could be hit by the seats. Always keep them off the stairs until the Wheel is stopped.

6. Persons who are intoxicated or under the influence of drugs must not be allowed on the Wheel.

7. Smoking by patrons should not be permitted since hot ashes can be dropped or blown into the eyes of other patrons on the Wheel.

8. If an unusual noise or condition develops while the Wheel is operating stop the wheel and get to the bottom of the trouble before you begin operating again.

9. Never operate the Wheel unless every part is there, in the right place and is properly connected. For example, the only two light panels that disconnect must be in operating position or the lip of the seat footbottom can catch on the end of a light panel and turn a seat upside down.

10. Be cautious and ready for the unexpected when children are involved. Under-age children should be accompanied by an adult.

11. Patrons waiting for the next ride must be kept away from any of the moving parts of the Wheel.

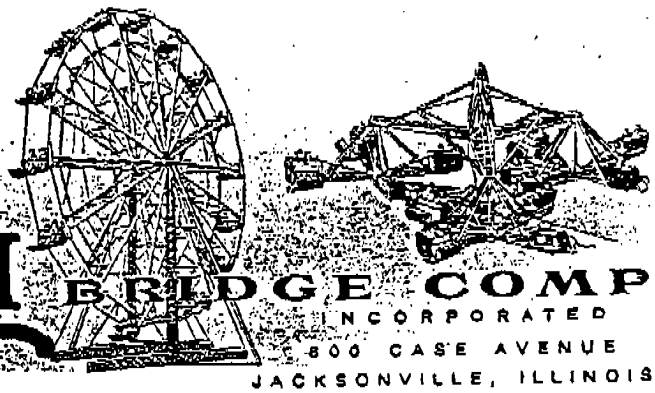
12. Be alert when the Wheel is operating and be prepared for an emergency stop.

13. Take pride in operating safely; a safe Wheel is a profitable one.

Do your part well and your HY-5-II Big Eli Wheel will reward you liberally in pleasure to own and operate, and good net returns on the money you have invested in it, while providing thrilling entertainment for your patrons with safety.

* * *

ALL STEEL PORTABLE
BIG ELI
FERRIS WHEELS



ELI POWER UNITS

ELI BRIDGE COMPANY
INCORPORATED
800 CASE AVENUE
JACKSONVILLE, ILLINOIS 62650-1493

BIG ELI

Bulletin No. 970129

Applies to all servo-controlled, two-directional HY-5 II, Eagle 16, Double Eagle, No. 5 and No. 16 Wheels

We have been informed that there have been occurrences of servo-controlled Wheels going "out of control", at which time they started running backwards unexpectedly while in the neutral (stop) position. Our position is that if the risk exists, the safest action to take is to shut the Wheel down until the problem is eliminated.

This condition is very dangerous, especially if the ride operator or passengers are on the loading platform or in the path of the Wheel when it starts moving.

There have been several causes suggested for this condition including a) the neutral leg going out on the power source, b) the controller board being bumped loose while traveling or c) burned out, d) water in the joystick device or e) a cracked gasket under the amphenol plug, (which allows hydraulic fluid to leak into the plug which breaks contact and the ride takes off).

The problem is tied in each case to the electronics and computer components. We have, therefore, designed a retrofit kit for the control wherein the servo, the joystick, and the control board are all removed and a mechanical control device is installed. Retrofit kits for the Sundstrand hydraulic transmission are available from us right now for $1,500 F.O.B. our factory, and kits for the OilGear hydraulic transmission will be available the middle of February (which will probably run about $2,000 or less). **We consider this modification to be mandatory.**

We have an alternative available as an immediate solution for OilGear customers. It is to purchase a new Sundstrand hydraulic unit with the retrofit kit (already partially attached). If you have an older OilGear unit this may make the most sense as we have obtained a special pricing on the Sundstrand transmission from our dealer. The transmission and retrofit kit together are $4,000.00 F.O.B. our factory. These prices are in effect until May 1, 1997.
There will be complete installation instructions provided with the kit.

PHONES: 800-274-0211 • 217-245-7146 • FAX 217-479-0103

Additionally, our customer service tech is available by phone 5 days a week from 7:00 a.m. to noon and 1:00 to 4:00 p.m. (CST) Monday through Friday.

If you prefer to have our technician perform your installation at your expense, please contact us as soon as possible so trips to a particular area of the country can be combined and the travel expense to you reduced.

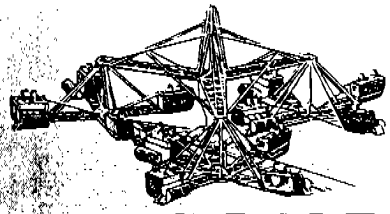
We have researched this problem and find no better or less expensive way to assure that the "out of control" condition cannot occur. Nor have any of our customers shared with us if they have found a solution. Safety must remain the foremost consideration. The "up side" is that replacement costs for the components on the retrofit system are considerably less than the electronic components and they are much less sensitive to the environment.

I know that every day your Eli Wheel is down is a problem and I apologize for the inconvenience. Please call if you have any questions of me or our customer service staff. Thank you for your cooperation.

Best regards,

Patty S. Rainey
President/CEO

ALL STEEL PORTABLE
BIG ELI
FERRIS WHEELS



Scrambler
ELI POWER UNITS

ELI BRIDGE COMPANY

INCORPORATED
800 CASE AVENUE
JACKSONVILLE, ILLINOIS 62650-1493

LEE SULLIVAN
PRESIDENT

March 22, 1991

MAR 25 1991

Mr. Lowell Parrish, Chief
Bureau of Public Fairs & Expo.
State of Florida
Room 1003, The Capitol
Tallahassee, FL 32399-0810

Dear Lowell:

It isn't enough to have carnies complaining about your rules, but now you have manufacturers complaining on behalf of their customers. This is one of those cases and I apologize for burdening you with it. At the same time, when a customer seems to have a legitimate appeal I do feel that I have to help him the best I can if you have a few minutes to listen.

First one is the matter of David Stevens who has some Sellner built fiberglass liners for Ferris Wheel seats. He assures me that these have the 4" height proficient profile which would preserve the function of the lapbar by maintaining the height of the old cushion. Our primary objection to seat liners is the loss of that cushion height which in this case is not a factor so I would request your permitting him to operate the one or two spots that he has left in Florida before moving back up into the midwest.

Second is a matter of Ken Detty from Lake Worth, Florida who has run afowl of his seat lock as compared with the true bolt that we have been using recently. Several years ago, our old supplier of malleable iron castings closed its doors and we had to find a new supplier. When we got new quotations for the parts for the seat locks we were so shocked that we abandoned it and went to the cross bolt as being a whole lot less expensive and fully functional. We still have no technical aversion to the old seat locks. Here again we would enter an appeal on behalf of our customer for continued use of the seat locks he now has.

Bonnie -
Please review & act as appropriate
Lowell

PHONES: 800-274-0211 • 217-245-7145 • FAX 217-479-0103

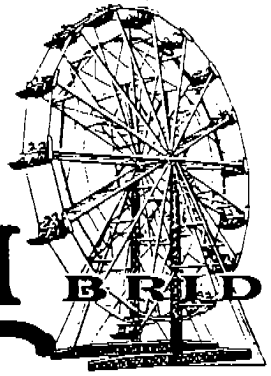
I certainly don't want to be on position of interfering with the execution of your office or to cast any shred of doubt on your judgment. When customers call, and ask me to request on their behalf something that does seem reasonable, I feel honor bound to at least make the effort.

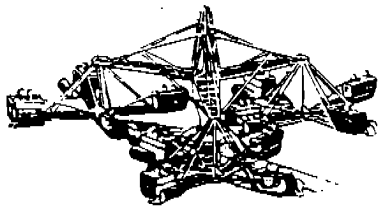
Thank you for your time and look forward to seeing you in Phoenix if not before.

Yours very truly,

Lee Sullivan
LAS:da

ALL STEEL PORTABLE
BIG ELI
FERRIS WHEELS





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BIG ELI

Bulletin No. 950427-1

Applies to All Eagle and Double Eagle Wheels
Applies to All HY-5 and HY-5 II Wheels

Date: April 27, 1995
Subject: Winch Cable

It has come to our attention that a winch cable on an Eagle 16 broke during dismantling of the Wheel. We have been using such a cable since about 1968 on every HY-5, HY-5 II, Eagle 16, and Double Eagle Big Eli Wheel, and until now we have never had a report of the failure of one of these cables.

This bulletin is being directed most specifically to owners of Eagle 16 and Double Eagle Wheels since there is a higher load on the winch cable on these Wheels than on HY-5 or HY-5 II Wheels. Therefore, there is more reason to be concerned about the soundness of the winch cable. Even so, the same care should be used on the winch cable for the HY-5 and HY-5 II Wheels.

The static maximum load on the winch cable was calculated to be 5329 pounds. Measuring an actual load, the maximum cable tension was found to be 4771 pounds, with the average between the calculated load and the actual load being 5050 pounds. The calculated and measured loads deviated less than 6% from the average.

From 1968 to 1989 the winch cable we supplied was 1/2" 6x37 IWRC extra improved plow steel, which, according to the manufacturer, had a breaking strength of 12.6 tons, or 25,200 pounds. Beginning in 1989 we began supplying a winch cable that was 1/2" 6x26 WS RRL Flex-S IWRC, with a breaking strength of 15.3 tons or 30,600 pounds.

The lesser strength cable even so has a breaking strength that is five times the 5050-pound average.

Engineering Bulletin # 950427-1
Date: April 27, 1995
Subject: Winch Cable

The strength of a cable involves many factors, each of which can affect the life of the cable. The following guidelines will allow an economical and reasonable service life, while maintaining a high degree of safety as far as preventing damage to the ride or possible injury to the passengers is concerned.

Replace a winch cable if any of the following conditions exist:

A. Kinking, as shown in Picture No. 1. Sometimes this has occurred when the winch cable has been pulled too tightly around the ends of the A-frames when folded for traveling.

B. Crushing or flattening of the cable because it has not been wound evenly on the winch drum. See Picture No. 2.

C. Bird caging, as shown in Picture No. 3, where the cable strands have expanded, leaving a "bird cage" in the middle.

D. Severe stretching occurring in a short section of cable, indicated by a marked reduction in the diameter of the cable.

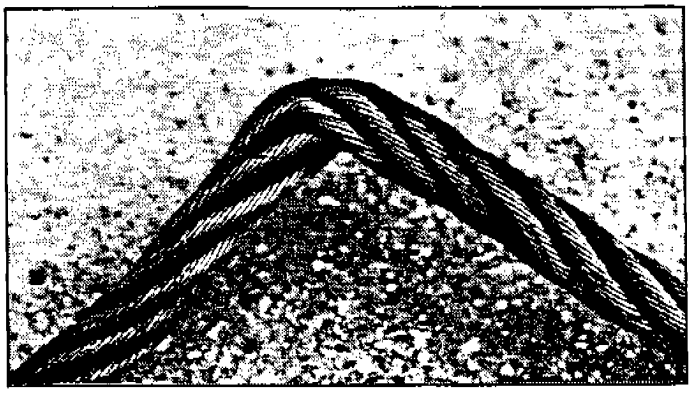
E. One strand in which 75% of the wires are broken.

F. General evidence of severe corrosion:

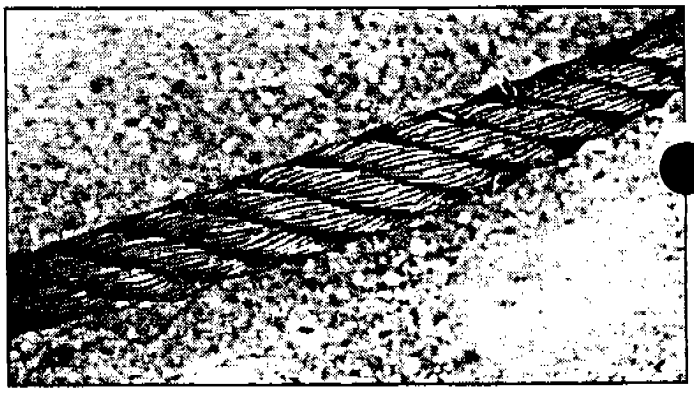
1. Rust appearing to stem from the interior of the cable.

2. Cable appears clean at present, but previous corrosion is evident from pitted condition of the wires.

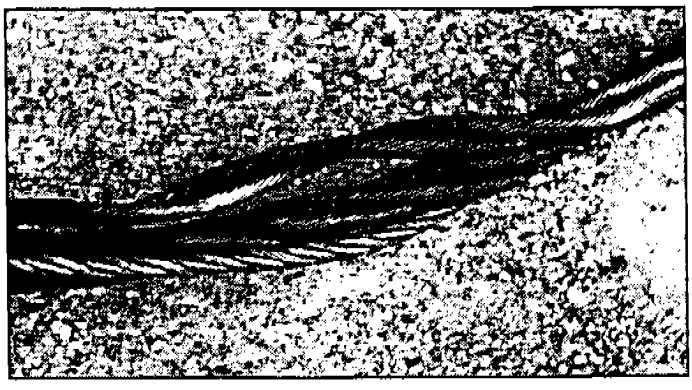
G. A number of wires, equal to the number of wires in a strand, being broken in the length of one rope lay, where "lay" is the length along the cable for a single strand to make a complete turn around the cable.



Picture No. 1



Picture No. 2



Picture No. 3

Engineering Bulletin # 950427-1
Date: April 27, 1995
Subject: Winch Cable

Snagging of the cable can cause broken strands. Dirt on a cable can act as an abrasive element, which will accelerate wear. Flexing of the cable around a drum causes the individual wires to wear against each other. The smaller the drum, the more wear will occur. Whenever there is gradual breaking of individual wires, this increases the loading on the remaining wires, which will shorten their life. Sudden jolts caused by a heavy load suddenly applied can greatly increase the loading on the cable.

Some of these factors will occur regardless of how well the cable is maintained. Even though we have had only a single report of a broken cable, we feel that it is extremely important that the winch cable be carefully examined to see if any damage found would fall within the guidelines above for determining when a cable should be replaced.

A winch cable should be replaced any time obvious damage is found, but because of the importance of the winch cable in the safe operation of the ride it should be replaced every five years. We consider this to be a mandatory requirement.

ELI BRIDGE COMPANY

Lee A. Sullivan
Chairman of the Board

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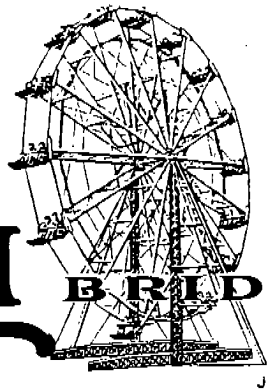

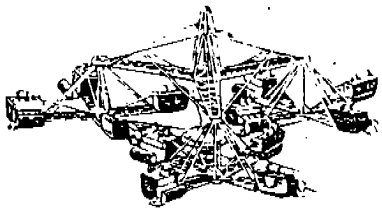

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BIG ELI

Bulletin No. 950508-1

Applies to All Big Eli® HY-5 Wheels

Date: May 8, 1995
Subject: Bolt Wear in HY-5 Spoke Stack Tenon Chain

The axle end of the spoke stack on all HY-5 Wheels is held together with spoke connection plates, spoke tenons, and .500" (1/2") diameter bolts. During normal setup, take-down, and transportation over the road, the bolts will wear. Experience has shown that the bolts wear the most where the two spoke connection plates bear against the bolt. The more a Wheel is set up, taken down, and transported over the road, the more bolt wear will occur.

INSPECTION:

Inspecting for wear can be done quite easily with the Wheel folded for transport as shown in Figure 1. Inspecting the bolts can be accomplished without removing the bolts which would cause the spoke stack to fall. All of the bolts should be inspected one at a time by looking at the bolt where the spoke connection plates bear against it. This can be done by loosening the nut on each bolt which attaches the spoke connection plates and the spoke tenon.

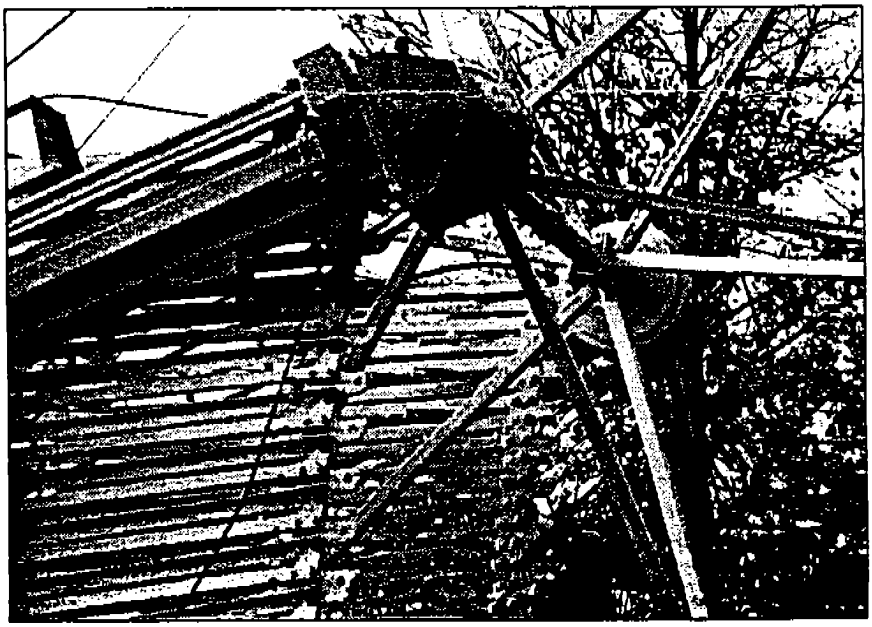

Figure 1

PHONES: 800-274-0211 • 217-245-7145 • FAX 217-479-0103

Engineering Bulletin # 950508-1
Date: May 8, 1995
Subject: Bolt Wear in HY-5 Spoke Stack Tenon Chain

CAUTION: DO NOT TAKE THE NUT COMPLETELY OFF THE BOLT.

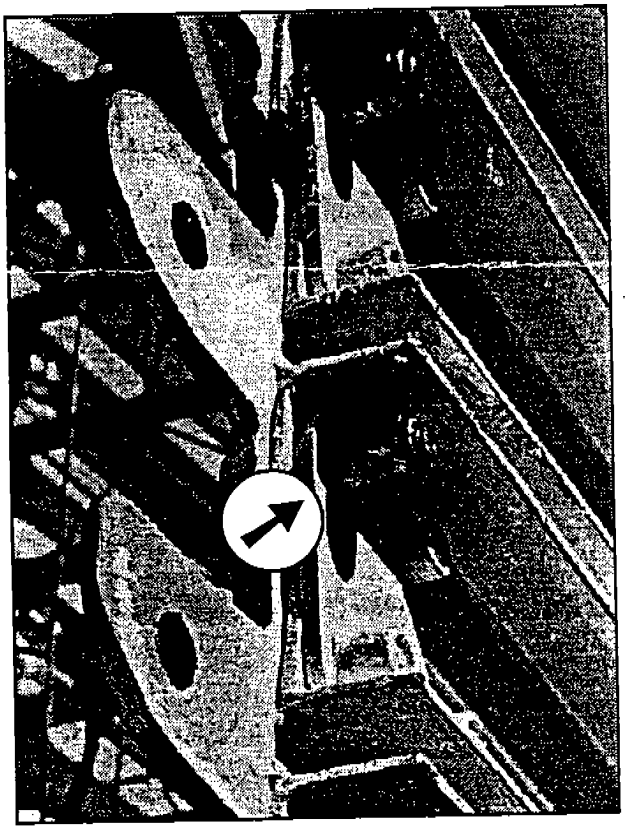

Figure 2

With the nut loosened, move the washer away from the spoke connection plate enough so that the bolt, indicated in Figure 2, can be seen where the inside spoke connection plate bears against it. A worn bolt will have a smaller diameter where the spoke connection plate makes contact with it. The original equipment bolt is .500" (1/2") in diameter. If you can see that any part of the bolt is worn by as much as .0625" (1/16") as shown in Figure 3, the bolt must be replaced.

Be sure to retighten the nut at each spoke tenon connection before loosening the nut on the next one to be inspected.

However, do not tighten the nut so much that the joint will not be able to pivot. This means the nut will be free to turn on the bolt unless double nutted as shown in Figure 2, or unless a self-locking nut is used.

If the bolt holes in the spoke connection plates or the spoke tenon have elongated from .0625" (1/16") to .125" (1/8") to a total hole length of between .5625" (9/16") and .625" (5/8"), then the spoke connection plates and the spoke tenon should be aligned as closely as possible and then reamed to a diameter of .625" (5/8"). Then install a .625" (5/8") bolt.

If the bolt holes in the spoke connection plates or the spoke tenon have elongated from .125" (1/8") to .250" (1/4") to a total hole length of between .625" (5/8") and .750" (3/4"), then the spoke connection plates and the spoke tenon should be aligned as closely as possible and then reamed out to a .750" (3/4") diameter. Then install a .750" (3/4") bolt.

If the bolt holes in the spoke connection plates or the spoke tenon have become elongated by more than .250" (1/4"), then you must consult with the Engineering Department at Eli Bridge Company to correct the wear problem.

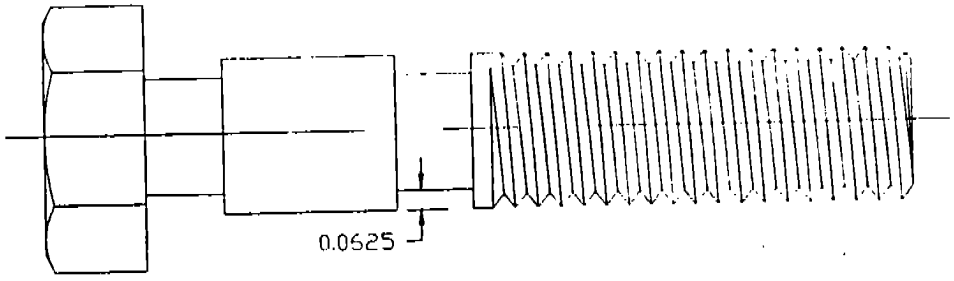

Figure 3

Engineering Bulletin # 950508-1
Date: May 8, 1995
Subject: Bolt Wear in HY-5 Spoke Stack Tenon Chain

HOW TO REPLACE THE BOLTS:

Replacing worn bolts must be done one bolt at a time because each bolt is holding the weight of the spokes hanging below it.

CAUTION: THE SPOKE STACK MUST BE SUPPORTED SO THAT IT DOES NOT FALL WHEN A BOLT IS REMOVED FOR REPLACEMENT.

This can be done by pulling up from the top spoke or by blocking up under the bottom of the spoke stack. Be sure that whatever is used is capable of supporting a minimum of 2400 lbs. on the side of the spoke stack where the bolt is to be removed.

Once the weight of the spoke stack is supported, the nut can be taken off the bolt and the bolt can be removed and replaced with a new bolt, using washers on both sides. The replacement bolts should be lubricated to help in assembly and to reduce bolt wear. Once the new bolt has been installed and the nut tightened, the procedure can be repeated on the next bolt that needs replacement. Continue this procedure until all bolts have been checked, and replaced where needed.

Replacement bolts and self-locking nuts with nylon inserts are available at most hardware stores or through Eli Bridge Company.

Replacement bolts to use:
.500-13 x 2.500 Grade 5 hex head bolt (standard)
.625-11 x 2.500 Grade 5 hex head bolt (oversize)
.750-10 x 2.500 Grade 5 hex head bolt (oversize)

INSPECTION SCHEDULE:

The mandatory inspection must be performed every twelve months. If you find that you are developing enough wear to require bolt replacement in twelve months time, then the time between inspections must be reduced.

ELI BRIDGE COMPANY

Lee A. Sullivan
Chairman of the Board

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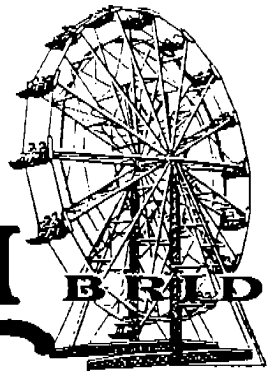
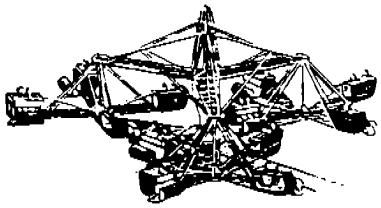
FERRIS WHEELS





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BIG ELI

Bulletin No. 950427-3

Applies to All HY-5, HY-5 II, Eagle & Double Eagle Wheels
Applies to All No. 5, No. 12 & No. 16 Wheels

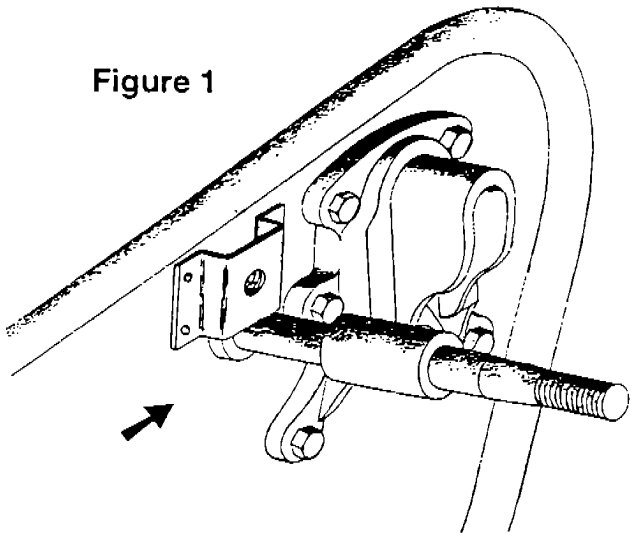
Date: April 27, 1995

Subject: Hanging Seats Correctly on Big Eli® Wheels

Hanging a seat on a Big Eli® Wheel would seem to be an obvious thing that could not be done incorrectly. However, on two occasions reported to us operators failed to do this properly.

In one case, instead of the seat pin being inserted up into the "Y" seat hanger casting the end of the seat pin was wedged between the "Y" casting and the hair guard bracket.

Figure 1



In the other case, the owner had installed the hair guard bracket incorrectly: he had rotated the bracket one-quarter turn so that the opening under the bracket was on the bottom instead of on the side where it should have been. The operator then lowered the seat into position, but instead of the seat pin entering the "Y" casting the head of the pin was inserted inside this hair guard bracket. This is shown in Figure 1.

Thinking that the seat was hung properly the operator reached around and inserted the "MYNY" seat lock without looking at the end of the seat. Had he looked, it would have been obvious the seat was not hanging properly, and the seat lock was actually locking nothing.

PHONES: 800-274-0211 • 217-245-7145 • FAX 217-479-0103

Engineering Bulletin # 950427-3
Date: April 27, 1995

Subject: Hanging Seats Correctly on Big Eli® Wheels

In each case, the Wheel was started turning, and eventually the end of the seat pin rolled out of where it had lodged. This allowed the end of the seat to drop so it was hanging by only one seat pin, and the seat became wedged against the other spoke so it could not turn freely. In both cases serious accidents resulted, and both could have been avoided if the operator had been making the proper installation.

Long time Wheel operators, familiar with Big Eli® Wheels, will probably feel that no operator would hang a seat on a Wheel in such an improper way, but nevertheless it has happened twice.

SEAT LOCKS

In order to require the operator to look at the end of the seat when locking it to each seat pin we discontinued the use of "MYNY" seat locks and replaced them with the seat lock pin shown in Figure 2. While it might be possible to slip the seat lock pin through the "Y" casting without looking at it, we felt that the operator would have to look at it in order to insert the Klik-pin into the seat lock pin.

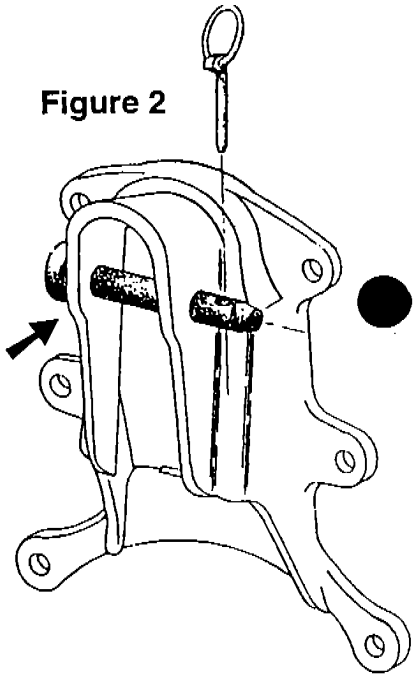


Figure 2

With that in mind, in June of 1993 we sent to all Wheel owners of record a supplement to the Wheel manual in which we specified that these seat lock pins were to be used in place of the "MYNY" seat locks. We considered this a mandatory change.

The "MYNY" seat locks worked very well for a great many years, and when properly used they would continue to be quite satisfactory. However, we felt that discontinuing their use in favor of the seat lock pins was an improvement in safety that had to be made.

HAIR GUARD BRACKETS

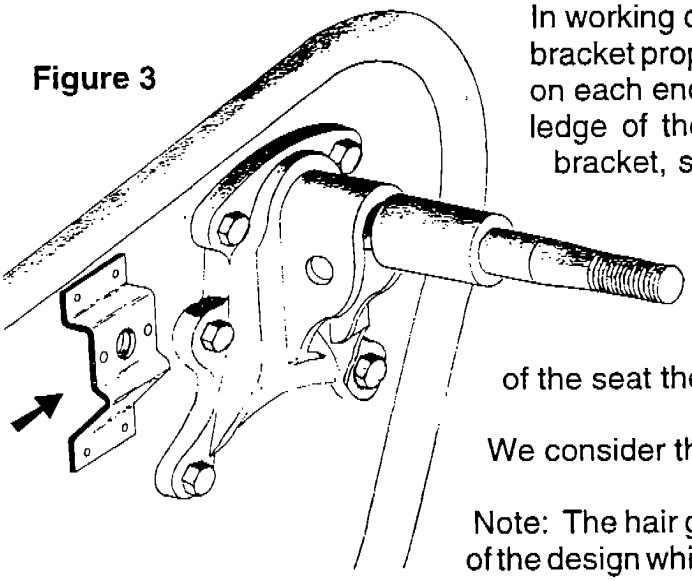
The installation of hair guards on Big Eli® Wheel seats became standard twenty-two years ago. The hundreds of Wheels sold before that time did not have the hair guards, and so we made available installation kits to permit using the hair guards with older seats. It was on one of these older Wheels in which the bracket was installed incorrectly, as in Figure 1. We have never known of this happening again, but because of how important this can be for the safety of the ride we felt it was important to call this to your attention. Through the years many Wheels have changed hands several times, and not always are bulletins and manuals handed over with the change of ownership.

If your Wheel does not have hair guards, we consider it mandatory that they be used. If the hair guard bracket on either side of the seat has been located as shown in Figure 1, then it should be replaced. The hair guard brackets on the back of the seat can be turned either way because safety is not affected.

Engineering Bulletin # 950427-3
Date: April 27, 1995

Subject: Hanging Seats Correctly on Big Eli® Wheels

Figure 3



In working out these modifications we found that, with the original bracket properly installed, with the opening under the bracket open on each end, it might be possible to rest a seat pin on the bottom ledge of the bracket. Consequently, we developed the longer bracket, shown in Figure 3, which has no ledge on the bottom side. If an attempt is made to rest the seat pin on the bottom side of the bracket, it will simply slide up the bracket. This longer hair guard bracket, shown in Figure 3, is needed only on the sides of the seat, and not on the back. If the shorter brackets are on the sides of the seat they should be replaced with the longer brackets.

We consider this to be a mandatory modification.

Note: The hair guard brackets shown in both Figure 1 and Figure 3 are of the design which used Air-Loc quarter-turn fasteners to fasten the hair guards to the seats. In recent years each hair guard bracket has a stud sticking out with a hole in it, through which a Klik-pin can be inserted after the hair guard has been slipped over the stud. If you need to order hair guard brackets, be sure to specify which kind you will need. If installing hair guards for the first time, then the hair guard brackets with the studs should be ordered.

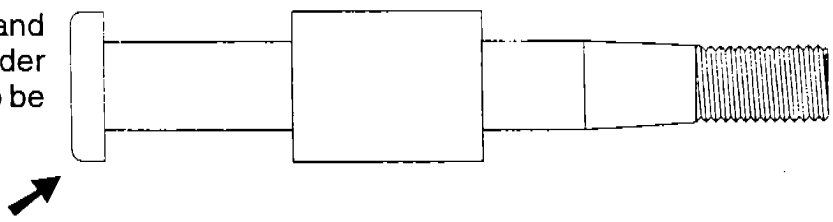
SEAT PINS

With the longer hair guard bracket, there is still the edge of the sheet metal at the bottom. Even though this is a very small ledge, we have found it is possible to rest the end of the seat pin on this edge.

To eliminate even this possibility, in recent years we have been adding a 1/8" radius to the end of the seat pin, as shown in Figure 4. This rounded edge eliminates any possibility of the seat pin resting on the bottom edge of the sheet metal of the hair guard bracket.

Rounding this edge also performs another function. As the "Y" casting and the seat pin may become worn, there is sometimes a tendency for the end of the seat pin to rub against the side of the seat, occasionally wearing a hole in the seat. This is not a safety problem, but rounding the edge provides a small additional clearance and keeps the sharp corner from bearing against the side of the seat.

Figure 4



Rounding off this edge can be done easily and quickly in any machine shop, and we consider adding the radius to the end of the seat pin to be a mandatory change.

Engineering Bulletin # 950427-3
Date: April 27, 1995

Subject: Hanging Seats Correctly on Big Eli® Wheels

The changes we are requiring in this bulletin are not major, but we believe in the interests of safety they must be done. Thousands of Wheel seats are hung properly on our Big Eli® Wheels every year, and the likelihood of a seat being hung improperly is extremely remote, but two accidents are two too many.

While we believe making these modifications will improve safety, the owner and operator have the final responsibility for the proper erection, maintenance, and operation of the ride.

ELI BRIDGE COMPANY

Lee A. Sullivan
Chairman of the Board

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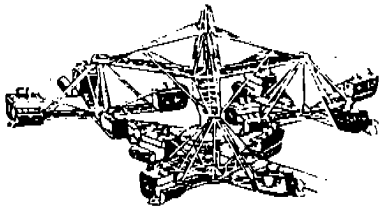

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BIG ELI

Bulletin No. 950501-1

Applies to All Eagle, Double Eagle and HY-5 II Wheels

Date: May 1, 1995
Subject: Pin Wear in Spoke Stack Tenon Chain

The axle end of the spoke stack on all Eagle 16, Double Eagle 16, and HY-5 II Wheels is held together with spoke tenon chain links, spoke tenons, and assembly pins. During normal setup, take-down, and transportation over the road, the assembly pins will wear. Experience has shown that the pins wear the most where the spoke tenon bears against the pin. This is between the two spoke tenon chain links at each pin connection. Also, the pins nearer the top of the spoke stack (when the Wheel is folded for transport as in Figure 1) wear the most, with wear decreasing as you go from spoke to spoke down through the spoke stack, so that the pins with the least wear are at the bottom of the spoke stack. The more a Wheel is set up, taken down, and transported over the road, the more pin wear will occur.

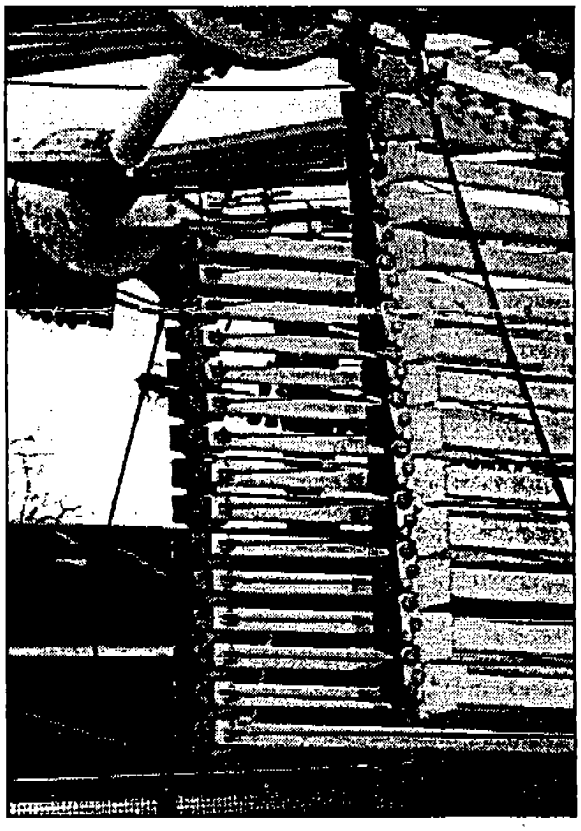

Figure 1

INSPECTION:

Initially inspecting for wear can be done easily with the Wheel folded for transport. The distance between the master spoke tenon and the next spoke tenon must be measured to the nearest 1/32" on each side.

PHONES: 800-274-0211 • 217-245-7145 • FAX 217-479-0103

Engineering Bulletin # 950501-1
Date: May 1, 1995
Subject: Pin Wear in Spoke Stack Tenon Chain

The drawing shown in Figure 2 shows where to take the measurement.

On an Eagle 16 or a Double Eagle 16, that dimension should be 5.0625" (5-1/16") to 5.125" (5-1/8"). On a HY-5 II, that dimension should be 5.15625" (5-5/32") to 5.21875" (5-7/32"). A measurement that is larger than the larger of the above dimensions indicates that the assembly pins are probably worn and require further inspection.

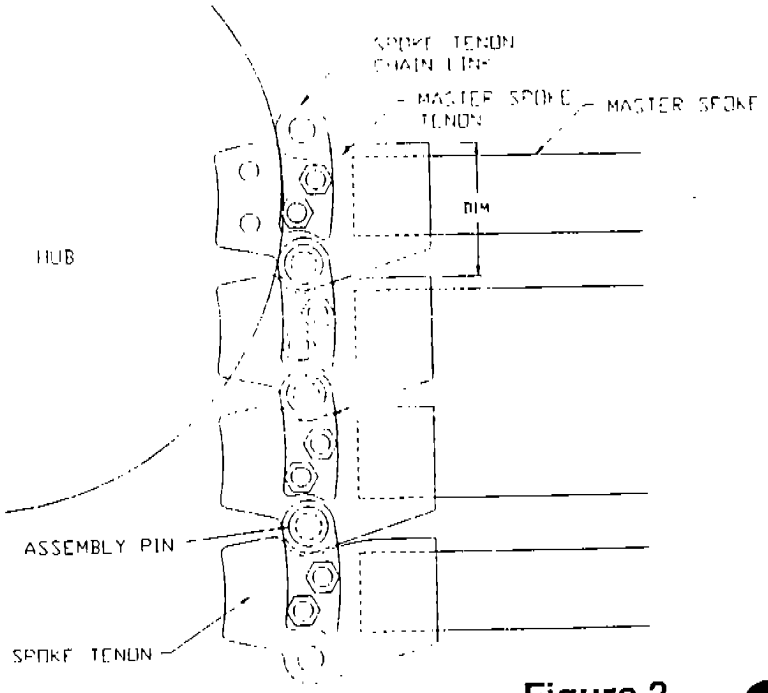

Figure 2

Further inspecting the assembly pins can be accomplished with the Wheel folded for transport without removing the assembly pins which would cause the spoke stack to fall. All of the assembly pins should be inspected one at a time by looking at the pin where the tenon bears against it between the two spoke tenon chain links. This can be done by loosening the nuts on the two bolts which attach the spoke tenon chain links and the spoke tenon.

CAUTION: DO NOT TAKE THE NUTS COMPLETELY OFF THE BOLT.

With the nuts loosened, pry the spoke tenon chain link on the inside of the Wheel back away from the spoke tenon enough so that the assembly pin can be seen where the spoke tenon bears against it. A worn pin will have a smaller diameter where the spoke tenon makes contact with it. The original equipment pin is one inch in diameter. If you can see that any part of the pin is worn by .0625" (1/16") as shown in Figure 3, the pin must be replaced. Be sure to retighten the nuts on each spoke tenon chain link before loosening the nuts on the next one to be inspected.

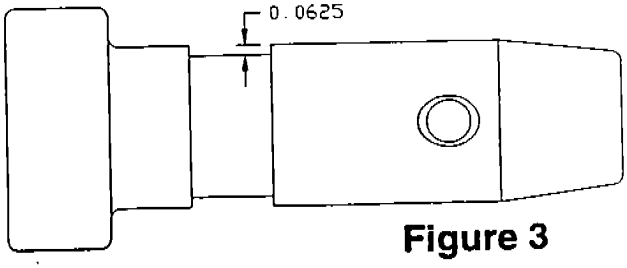

Figure 3

If the pin holes in the spoke tenon chain link or the spoke tenon have elongated .0625" (1/16") to a total length of 1.0625" (1-1/16"), then the spoke tenon chain links and the spoke tenon should be aligned as closely as possible and then reamed out to a diameter of 1.0625" (1-1/16"). Then an oversize pin should be installed.

Engineering Bulletin # 950501-1
Date: May 1, 1995
Subject: Pin Wear in Spoke Stack Tenon Chain

HOW TO REPLACE THE ASSEMBLY PINS:

Replacing worn pins must be done one pin at a time because each assembly pin is holding the weight of the spokes hanging below it.

CAUTION: THE SPOKE STACK MUST BE SUPPORTED SO IT DOES NOT FALL WHEN A PIN IS REMOVED FOR REPLACEMENT.

This can be done by pulling up from the top spoke or by blocking up under the bottom of the spoke stack. Be sure that whatever is used is capable of supporting a minimum of 3400 lbs. for an Eagle 16, 4150 lbs. for a Double Eagle 16, or 2500 lbs. for a HY-5 II on the side of the spoke stack where the pin is to be removed.

A worn pin will usually be difficult to remove because the spoke tenon will rest on the worn smaller diameter of the pin so that the pin hole in the spoke tenon is not in line with the pin holes of the spoke tenon chain links. The spoke stack must be moved up or down until the holes are lined up enough to remove the worn pin and replace it with a new pin. The replacement pins should be lubricated to help in assembly and to reduce pin wear. Once the new pin has been installed and the washer and cotter pins replaced, the procedure can be repeated on other pins that need replacement.

Approved replacement pins are available through Eli Bridge Company.

Name	Eli Part #
Assembly Pin - 1" (standard)	283 110
Assembly Pin - 1-1/16" diameter (oversize)	283 110A
Assembly Pin - 1-1/8" diameter (oversize)	283 110B

INSPECTION SCHEDULE:

The mandatory inspection must be performed every twelve months. If you find that you are developing enough wear to require pin replacement in twelve months time, then the time between inspections must be reduced.

ELI BRIDGE COMPANY

Lee A. Sullivan
Chairman of the Board

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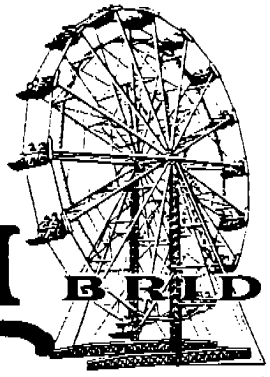

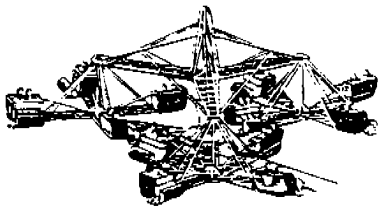

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BIG ELI® Wheel Bulletin No. 8

Applies to ALL Serial Numbers

DATE: November 16, 1994

SUBJECT: Wheel Seat Fiberglass Inserts

Fiberglass seat inserts are being manufactured and sold to owners of Big Eli® Wheels. These inserts are not manufactured by Eli Bridge Company. In our testing and many years of working with customers regarding their Big Eli® Wheels, we believe we have developed a seat design that has stood the test of time. Eli Bridge Company does not condone nor authorize the use of these fiberglass seat inserts on Big Eli® Wheels and believes that all who are using them ought to be warned not to use them and to remove them promptly.

It appears as though the fiberglass shells being sold by the manufacturers do not enhance security, but in fact, reduce security. The fiberglass shells require changes in the entire handlebar and latching equipment. Any alteration of these component parts can make the latching less positive and potentially dangerous.

This alteration of the structural integrity of the seat and lessening of the security of the handlebar and latching mechanism makes it mandatory that anyone currently using these fiberglass seat inserts on Big Eli® Wheels immediately discontinue same.

Lee Sullivan

Chairman of the Board
Eli Bridge Company

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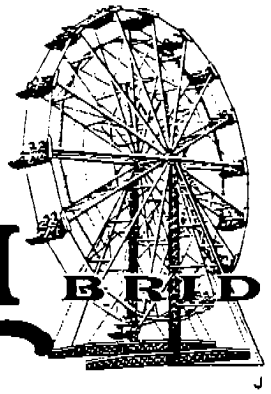

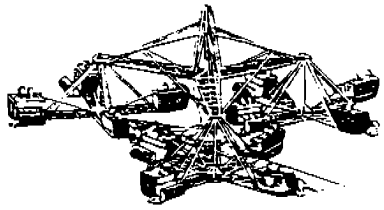

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BIG ELI Scrambler® Bulletin No. 9

Applies to ALL Serial Numbers

DATE: November 16, 1994

SUBJECT: Scrambler® Seat Fiberglass Inserts

Fiberglass seat inserts are being manufactured and sold to owners of Big Eli® Scramblers®. These inserts are not manufactured by Eli Bridge Company. In our testing and many years of working with customers regarding their Big Eli® Scramblers®, we believe we have developed a seat design that has stood the test of time. Eli Bridge Company does not condone nor authorize the use of these fiberglass seat inserts on Big Eli® Scramblers® and believes that all who are using them ought to be warned not to use them and to promptly replace any in use with a seat cushion design meeting Eli Bridge Standards.

Very early in the history of the Scrambler® use, a Scrambler® owner suggested that we raise the front edge of the seat to provide a better feeling of security for the passengers. We investigated and found this to be a valuable improvement, it was immediately incorporated into our design, and we have continued to use this feature throughout the 39-year history of the Scrambler®.

The seat cushion we are currently suppiying is 3-3/16 inches high on the back side, and the highest part of the seat cushion is 6-1/2 inches high on the front edge, measuring back from the rounded front edge of the cushion 1-7/8 inches from the front vertical surface of the seat cushion.

In the case of the fiberglass shells, they do not incorporate this raised front edge. Our investigation of these fiberglass shells leads us to conclude that they lower the security of the passengers.

Therefore, it is mandatory that the use of these fiberglass seat inserts in Big Eli® Scrambler® be immediately discontinued.

Lee Sullivan

Chairman of the Board
Eli Bridge Company

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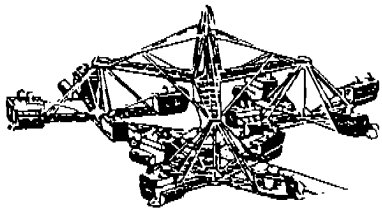

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BIG ELI

Bulletin No. 950427-4

Applies to HY-5 & HY-5 II Wheels Serial Nos. 1-68 to 81-90
Applies to Eagle & Double Eagle Wheels Serial Nos. 1-89 to 8-90

Date: April 27, 1995
Subject: Star Light Roller Panel Channels

It has come to our attention that on a 19-year-old HY-5 one of the roller channels on a star light panel came loose when all four of the sheet metal screws holding it were lost. In 19 years it may be that the screws or the holes in the panels simply rusted away. All we know for certain is the four screws were missing.

It is potentially dangerous for any part of the rotating structure to become loose on any Big Eli® Wheel. In addition to normal vibrations when the ride is operating, trailer-mounted rides are subjected to heavy vibration because of traveling on the highway, and so it is a particular concern that all parts be checked regularly to be certain they are securely fastened.

On December 28, 1990, Eagle 16 Wheel serial number 9-91 was the first to be equipped with stainless steel star light panels and the roller channels were riveted to the star light panels with stainless steel Pop rivets. The first HY-5 II so equipped was serial number 82-91, which was shipped on September 4, 1991. All later serial numbers of Eagle 16 and HY-5 II Wheels have had the stainless steel star light panels with riveted roller channels.

PHONES: 800-274-0211 • 217-245-7145 • FAX 217-479-0103

Engineering Bulletin # 950427-4
Date: April 27, 1995
Subject: Star Light Roller Panel Channels

We believe this use of stainless steel Pop rivets will ensure much longer and more positive fastening of the roller channels to the star light panels. We consider it mandatory that all existing star light panels, on trailer-mounted Big Eli Wheels delivered before December 28, 1990, have the original sheet metal screws holding the roller channels to the star light panels be replaced with stainless steel Pop rivets.

On new star light panels the 3/16" diameter stainless steel rivets we are using are identified as follows:

Pop SSD 66 SSBS

The original hole size was made with a No. 25 drill size (.1495" diameter), and for 3/16" diameter stainless steel rivets the hole side should be increased to a No.11 drill size (.1910" diameter). If you find the rivets are loose in the holes because of rusting or wear, it will be necessary to go to the next larger size of rivet, because the rivet will not develop full strength if it is not a good fit in the hole. This might also require drilling the holes in the roller channel and star light panel to fit the next larger stainless steel rivet.

On HY-5 and HY-5 II Wheels, 96 rivets will be required, four per roller track. On Eagle 16 and Double Eagle Wheels 128 rivets will be required, four per roller track. These rivets are available from Eli Bridge Company.

To repeat, we consider this modification mandatory on all HY-5 and HY-5 II trailer-mounted Wheels delivered before September 4, 1991, and all Eagle 16 and Double Eagle trailer-mounted Wheels delivered before December 28, 1990.

ELI BRIDGE COMPANY

Lee A. Sullivan
Chairman of the Board

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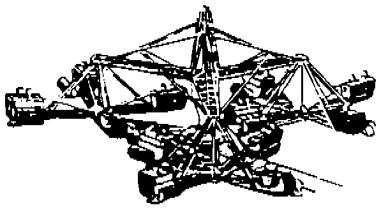

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BIG ELI

Bulletin No. 950427-2

Applies to All Eli Wheels of Every Size

Date: April 27, 1995
Subject: Wear of "Y" Castings

It has always been the policy of Eli Bridge Company to provide our customers with the best information we can, and to alert them to any problem areas that come to our attention.

Some months ago we sent out to all Big Eli® Wheel owners of record a supplement for their Wheel manual. In it, under the title of WEAR OF "Y" SEAT HANGER CASTINGS, it was stated that the thickness of the top of the casting, when new, was 3/8", and when it was worn down to a thickness of 5/16" then the casting should be replaced.

This has resulted in a rash of orders for these castings, considerably beyond what has normally occurred. This has caused us to go back and review this decision.

Some years ago we performed tests to determine what load the "Y" casting and the seat pin could withstand. Before beginning the test we machined out the top of the "Y" casting so that it was only 3/16" thick. At a load of 14,250 pounds the seat pin broke, but the "Y" casting was still intact.

PHONES: 800-274-0211 • 217-245-7145 • FAX 217-479-0103

Engineering Bulletin # 950427-2
Date: April 27, 1995
Subject: Wear of "Y" Castings

Since the entire weight of a No. 5 ground-model Big Eli Wheel, containing 24 seat pins and 24 "Y" castings, is only about 12,000 pounds, it can be seen that the loading of the "Y" casting is very conservative and is well able to carry normal loads, even when badly worn.

As a result of this review we believe the wear limit should be changed on the "Y" casting. In the light of our test results, and from our experience over 94 years, we have determined that we should allow 1/8" wear, so that the remaining thickness could be reduced to 1/4" instead of the 5/16" we previously specified as the wear limit.

The manual supplement did not cover wear limits on Little Eli Wheel "Y" castings. These castings are also 3/8" thick at the top, and when they are worn down to a 1/4" thickness, then the castings should be replaced.

We consider these wear limits to be mandatory.

ELI BRIDGE COMPANY

Lee A. Sullivan
Chairman of the Board

May 30, 1995

MEMORANDUM

TO: All Inspection Specialist and Supervisors
Bureau of Fair Rides Inspection

FROM: Ron Safford, Chief RS
Bureau of Fair Rides Inspection

SUBJECT: Eli Bridge Ferris Wheel Test Gage

Enclosed is one Eli Bridge Ferris Wheel Test Gage for Big Eli Wheels only and instruction sheets for its use. These are from Eli Bridge.

Please use it as appropriate and keep it with your other tools. This Eli Bridge Test Gage should be returned to the Bureau with other items when requested.

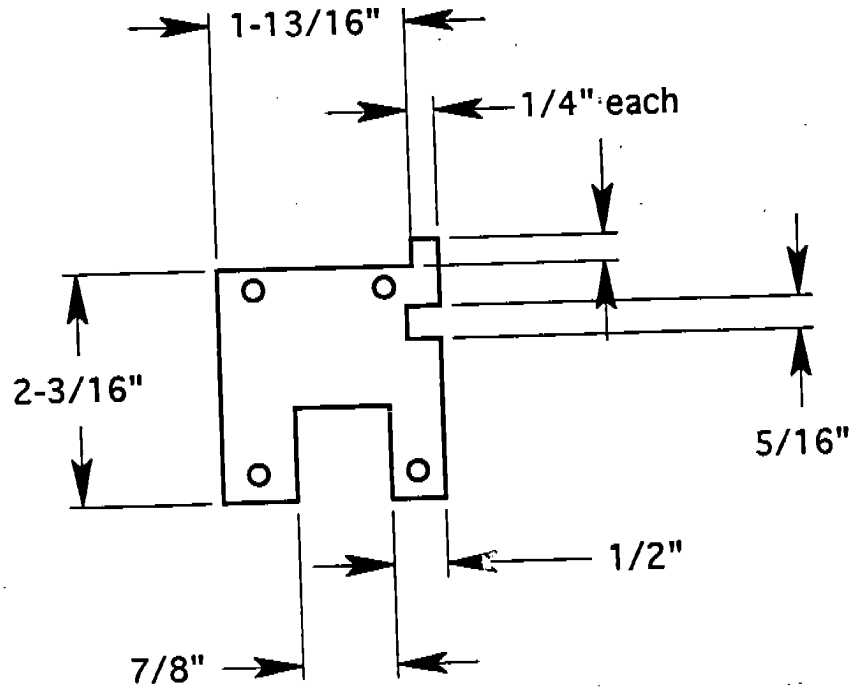
RS/cc

Enclosure

Eli Bridge Ferris Wheel Test Gage*

For Big Eli (tm) Wheels ONLY

NOT FOR USE WITH: Little Eli (tm) Wheels or Big Eli (tm) wheels re-manufactured by other companies.



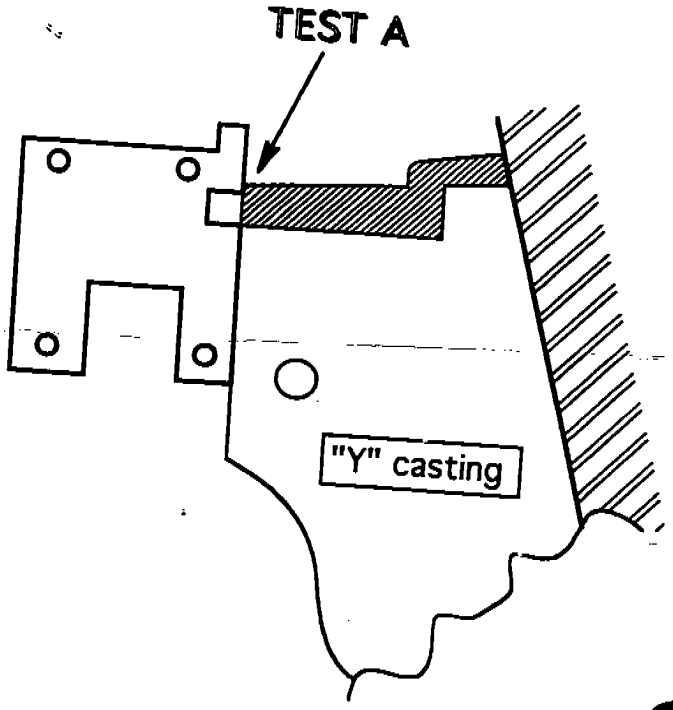
Material is Aluminum, thickness is 3/16" or greater.

Tolerances are +/- 0.005" for measurements indicated above.

*** This gage provided by NAARSO (National Association of Amusement Ride Safety Officials) as a guide for inspection. This gage shall be used only as a guide and all measurements shall be checked and verified prior to any action being taken. For further information concerning Big Eli (tm) Wheels please contact Eli Bridge Company, (800) 274-0211.**

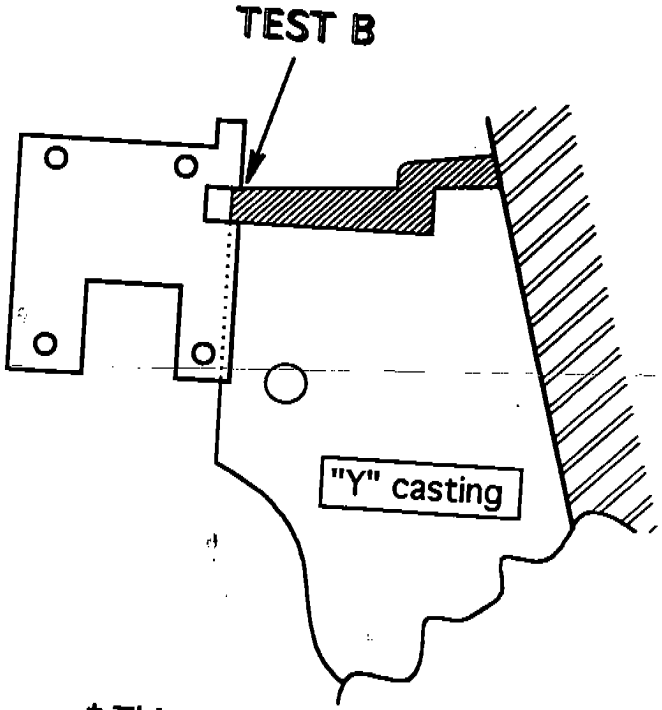
"Y" Casting Tests - Part 1

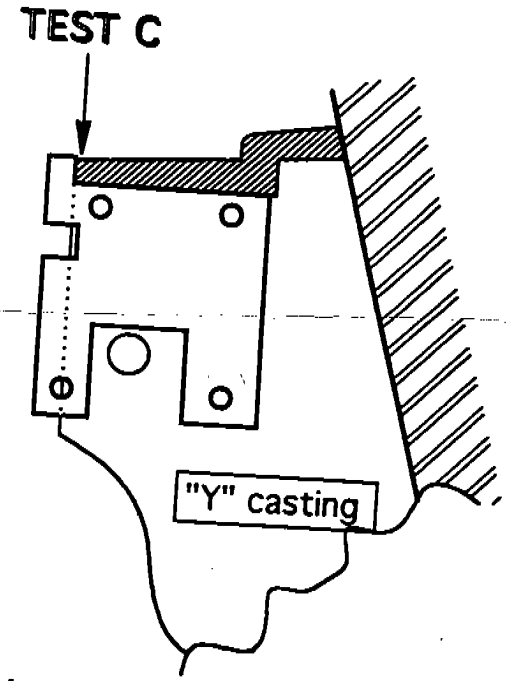
TEST A: The thickness of the casting end shall be greater than 1/4". This test checks to see if thickness is greater than 5/16". If gage does not fit over end of casting, proceed to TEST D.



TEST B: If gage does slip over end of casting, it indicates that thickness is less than 5/16", and requires TEST C be performed.

TEST C: If casting thickness is less than 1/4", which is shown here, it requires the "Y" casting be replaced.





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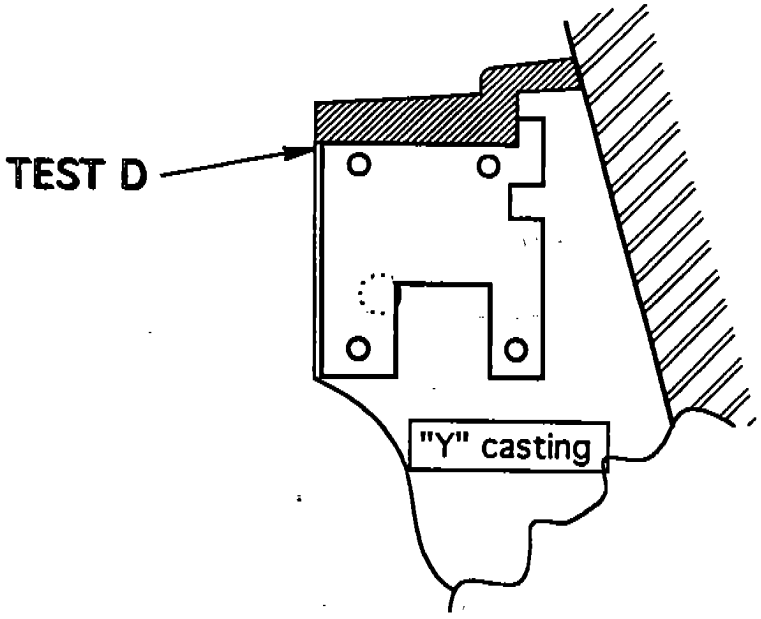
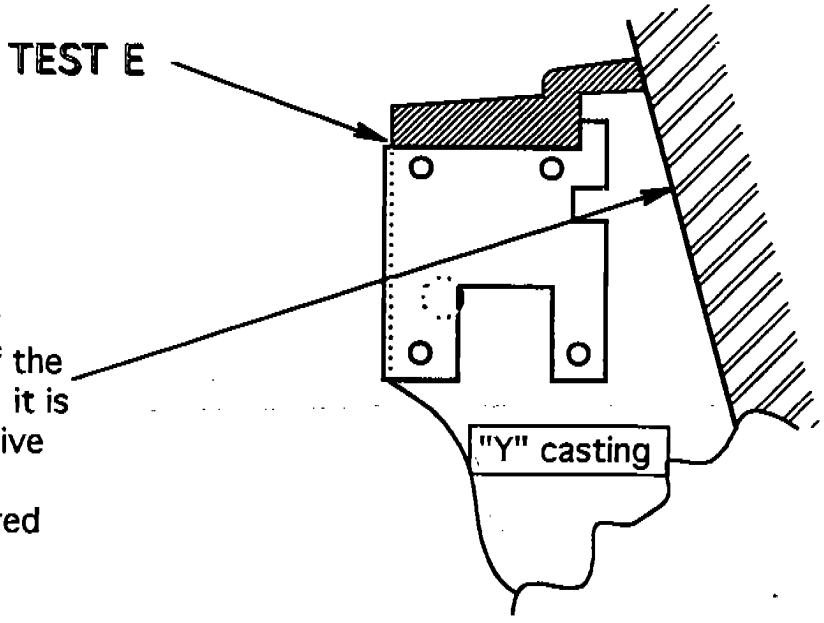
"Y" Casting Tests - Part 2

TEST D: This test checks the depth of the "Y" casting. When the test gage is inserted as shown, the casting end should stick out beyond the edge of the gage. If it does, proceed to TEST F.



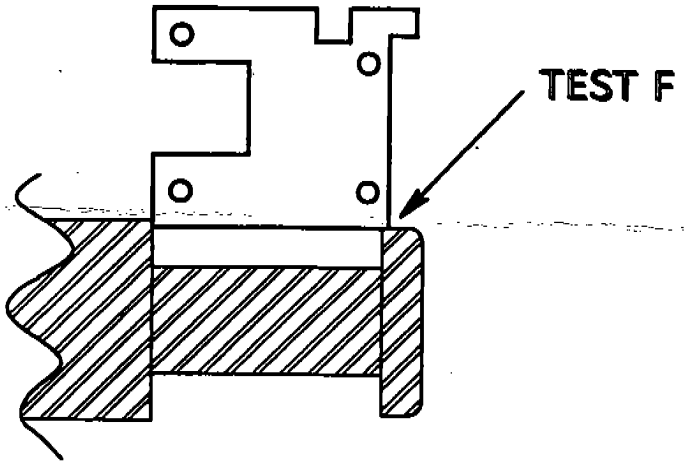
TEST E: If the end of the gage sticks out past the end of the casting as shown in the diagram, the "Y" casting shall be replaced.



NOTE: If you see wear occuring on the wall of the seat near this location, it is an indication of excessive wear and should be investigated and repaired promptly.

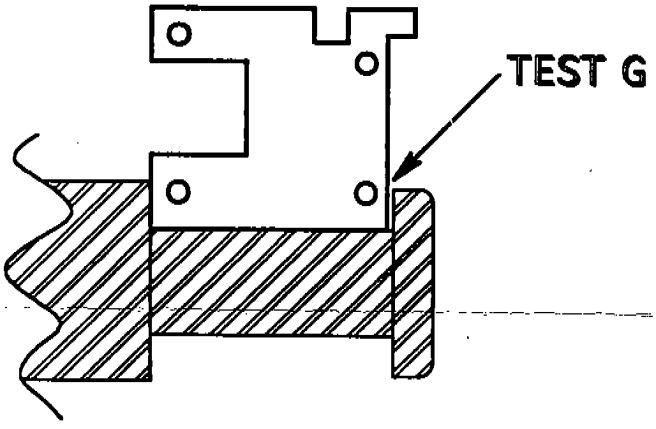
*** This gage provided by NAARSO (National Association of Amusement Ride Safety Officials) as a guide for inspection. This gage shall be used only as a guide and all measurements shall be checked and verified prior to any action being taken. For further information concerning Big Eli (tm) Wheels please contact Eli Bridge Company, (800) 274-0211.**

Seat Pin Tests - Part 1



TEST F: This test is designed to measure the wear at the ends of the reduced diameter portion of the seat pin. If the gage does not go inbetween the shoulder and cap/head of the seat pin, as shown, proceed to TEST H. Be sure to check all-the-way around the seat pin, not in just one location.

TEST G: If the gage does go inbetween the shoulder and cap, as shown here, the seat pin shall be replaced.



NOTE: Other tests of the seat pin are required. Please refer to the owner's manual for a complete listing.

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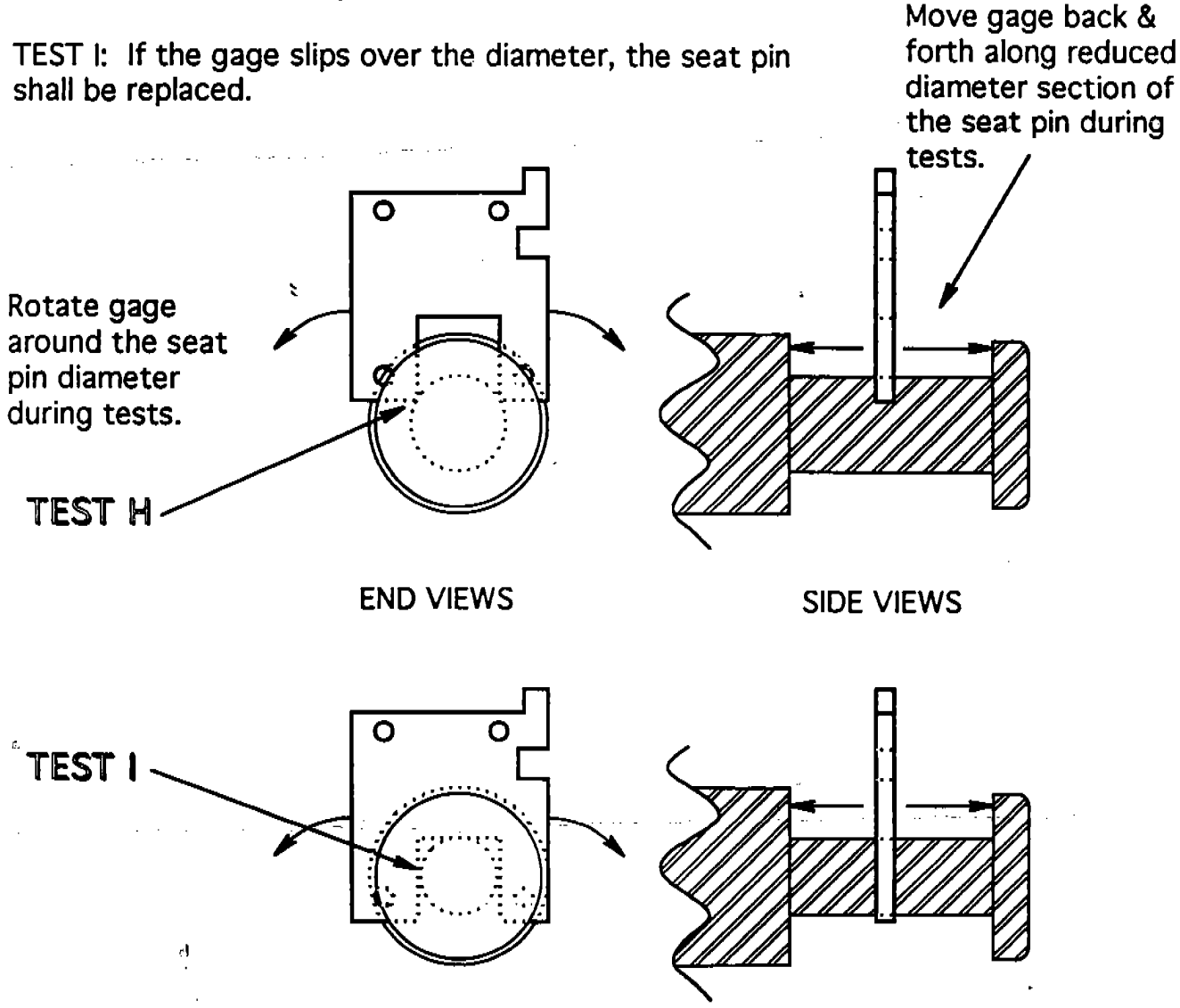
Seat Pin Tests - Part 2

TEST H: This test is designed to measure the wear of the reduced diameter section of the seat pin. The gage should be placed as shown below, while also moving back & forth and around the diameter. If the gage does not slip over the diameter, proceed to TEST J.

TEST I: If the gage slips over the diameter, the seat pin shall be replaced.



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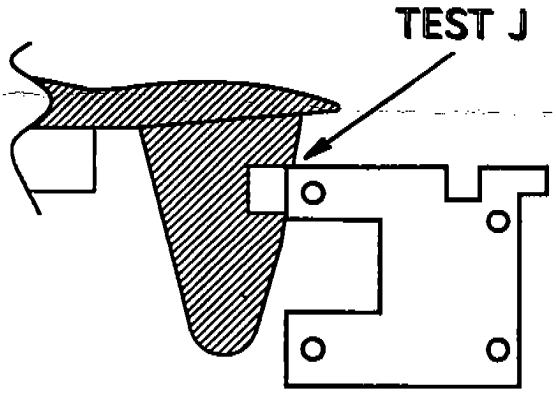
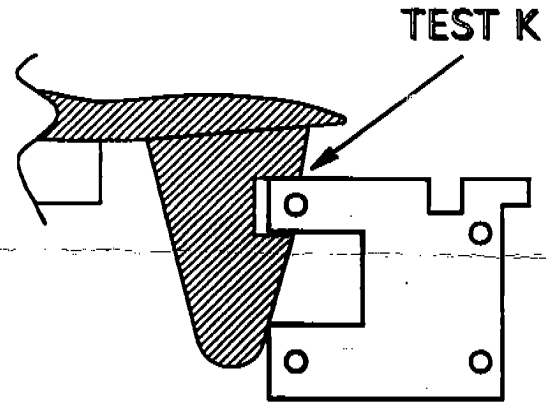
"J" Casting Tests



TEST J: This test is designed to check the size of the slot on the "J" casting. The gage should be used as shown, and if it does not fit inside the slot, proceed to TEST L. (Maximum allowed is 1/2" opening.)



TEST K: If the gage fits into the slot on the "J" casting, the "J" casting shall be replaced.

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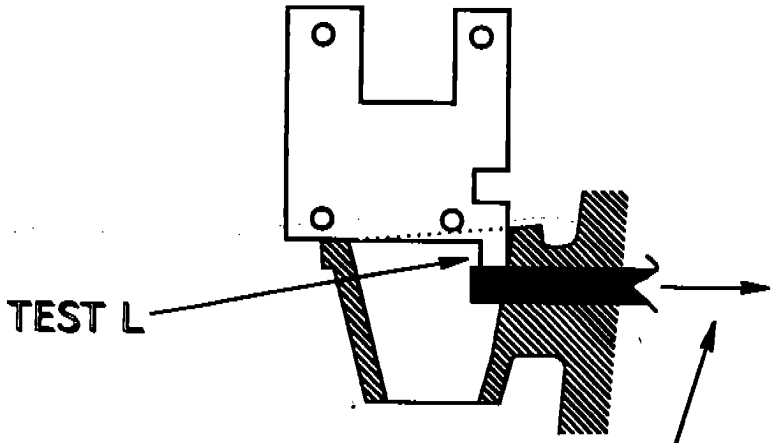
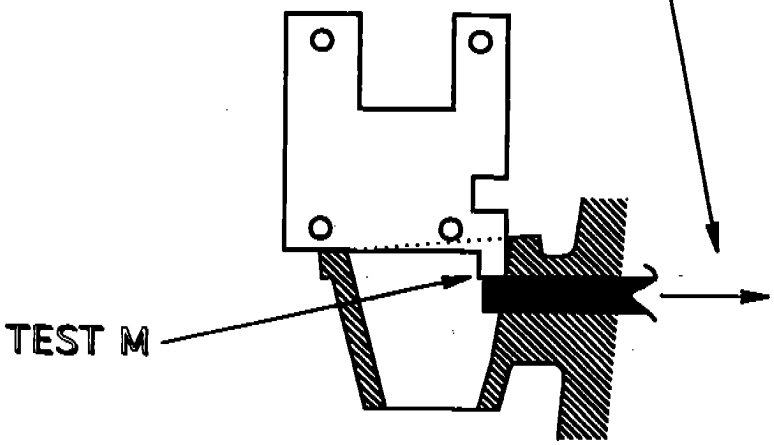
"T" Socket / Seat Handlebar Latch Tests

TEST L: This test is designed to check the length of the plunger rod inside the "T" socket. First, pull and release plunger, then place 'nipple' end of gage into "T" socket as shown. If plunger rod sticks out past gage, proceed to TEST N.



Pull plunger out and release prior to test.

TEST M: If plunger rod does not stick out past gage 'nipple', repair or replace as necessary until TEST L is passed.



NOTE: Other inspection items may be required, please review owner's manual.

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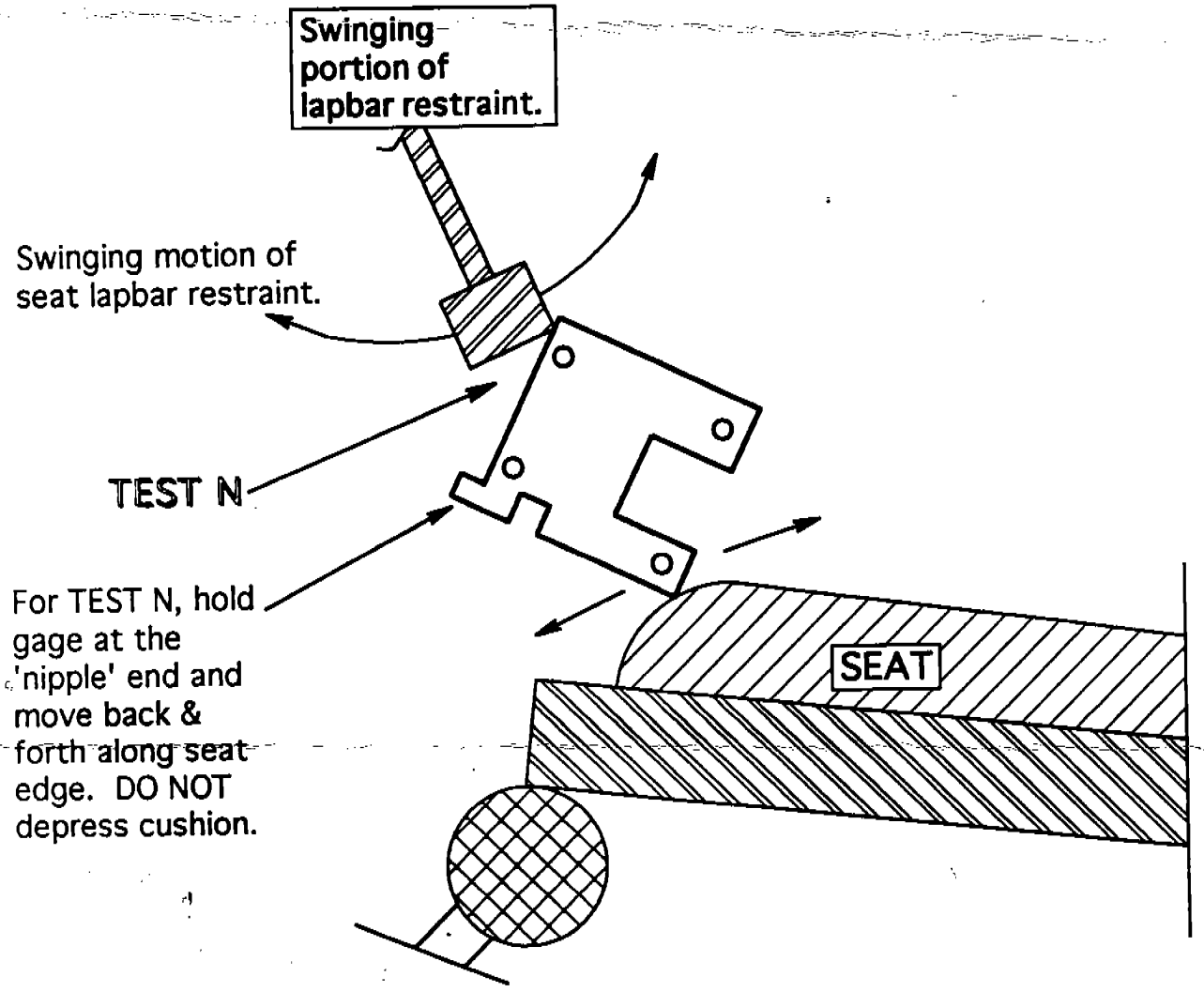
Handlebar / Seat Clearance Test

TEST N: This test is designed to help determine if the proper gap exists between the seat and the swinging lapbar restraint. The maximum allowed distance from the edge of the seat cushion to the swinging portion of the lapbar restraint is 3 inches. If the gage is moved as shown below and firmly contacts the swinging portion of the lapbar, the distance is acceptable. Remember, less distance is better. If the gage does not touch the lapbar, repair and/or replacement of the seat and/or cushion is required.



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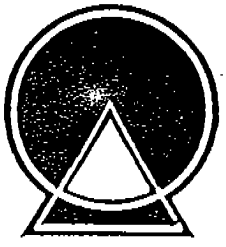
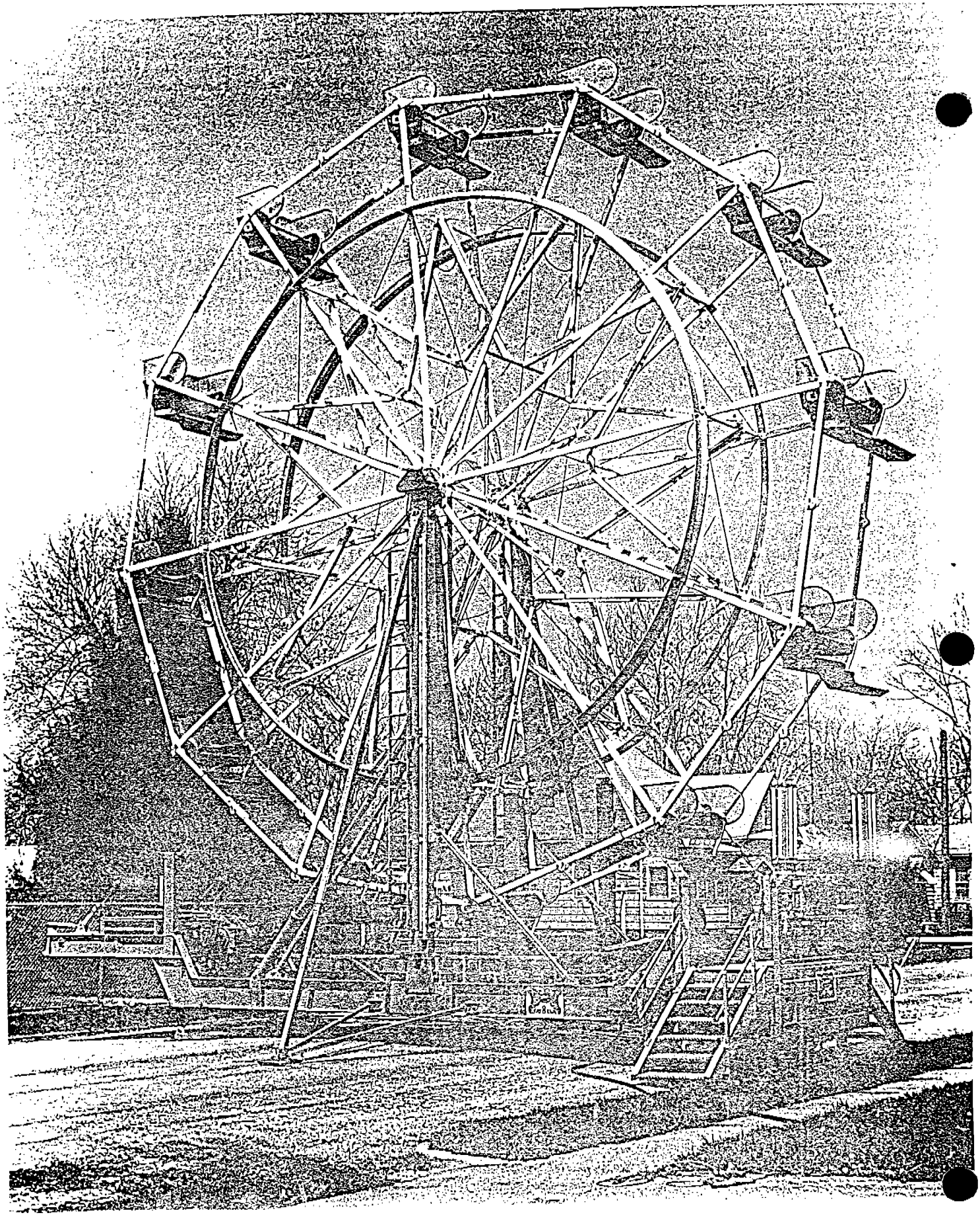
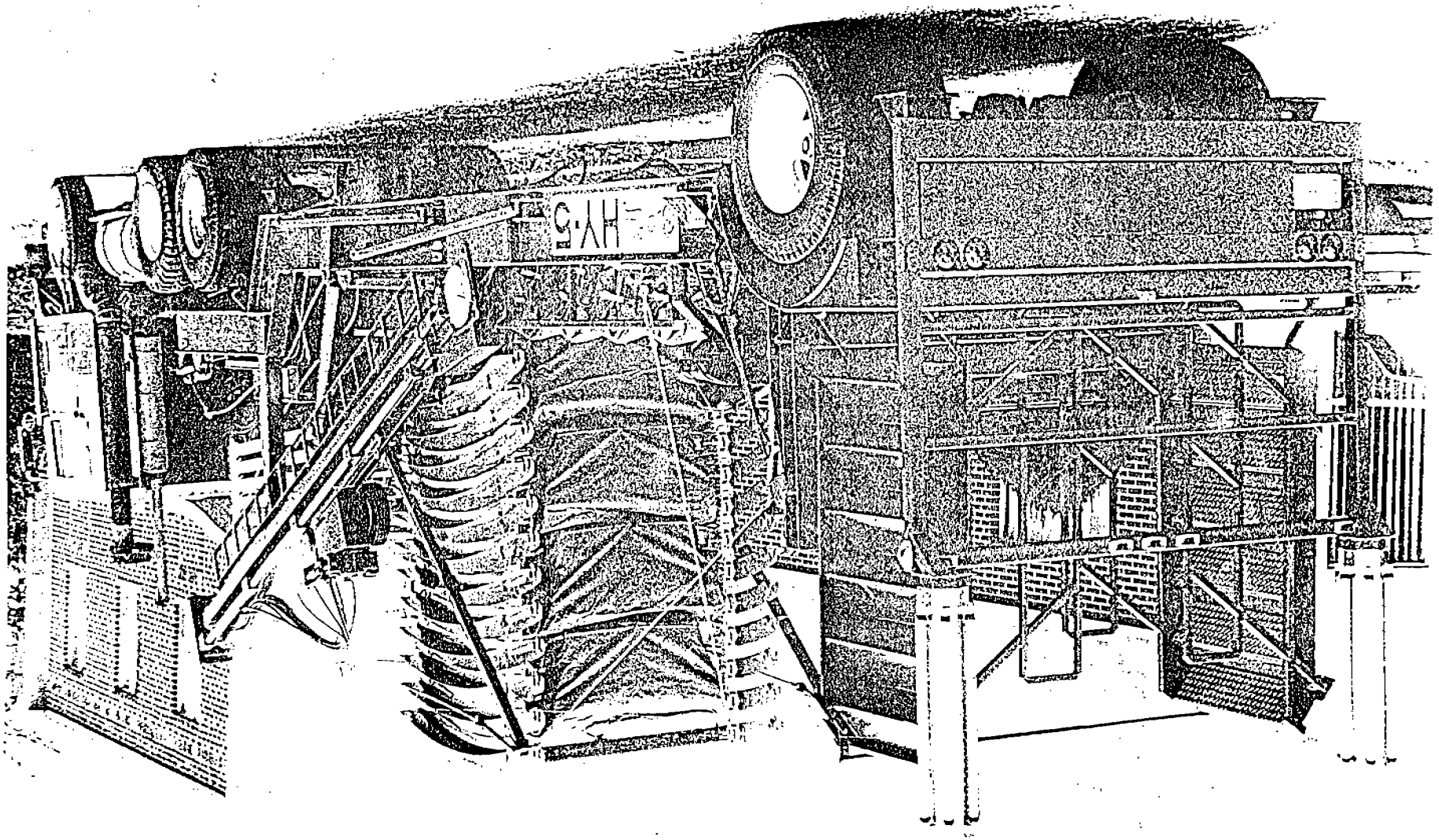
INSTRUCTIONS
FOR
ERECTING
AND
OPERATING
THE

HY-5-II BIG ELI WHEELS

MANUFACTURED BY THE
ELI BRIDGE COMPANY
INCORPORATED
800-820 CASE AVENUE
JACKSONVILLE, ILLINOIS 62650
AREA CODE 217 PHONE 245-7145






HY-5

GENERAL DESCRIPTION OF THE HY-5 II BIG ELI WHEEL

The HY-5 II BIG ELI WHEEL combines the time-proven design features and reliability of ground-model BIG ELI WHEELS, together with details of design resulting from sixteen years of experience with the original HY-5 design, in a self-contained semi-trailer with built-in labor saving features so that two men can quickly, and with little physical effort, erect it for operation or dismantle it for moving to the next location. All heavy work is handled by hydraulic operation. The heaviest pieces to be handled are the seats, which are made of aluminum for light weight. Four of the seats remain on the Wheel and the remaining eight seats are stored on racks in the bed of the trailer.

The trailer-mounted/hydraulic HY-5 II BIG ELI WHEEL stands 41 ft. 9 in. high, and carries 12 aluminum BIG ELI seats to provide a seating capacity of 24 to 36 passengers. Standard equipment includes two 6-point star lighting assemblies, which fold with the Wheel and are not removed. They are equipped with rapid start fluorescent lamps and each star consists of 12 light panels. There is a row of slimline fluorescent lamps on each tower and a cluster light on each side above the stairs at the rear, each equipped with six slimline lamps.

Wiring for the lights is 3-wire grounded. also included are 12 seat covers, necessary equipment and tools, and complete hydraulic and trailer equipment.

The Wheel and all equipment are fully contained on one 38 ft. trailer, which conforms with nationwide regulations.

When folded down, the Wheel is approximately 13 ft. 6 in. tall at its highest point, varying slightly up or down; depending on the height of the fifth wheel on the tractor. It has a 96 in. clearance width. All clearance lights conform to Federal and State specifications.

The main drive consists of two 15 horsepower, 1750 rpm, 3-phase electric motors working together; each driving a variable displacement hydraulic pump, which provides power for the four hydraulic motors driving the Wheel. Each hydraulic motor is fitted with a rubber tire which drives a circular rim on the Wheel. The tires work in pairs, gripping the rims between them in a caliper arrangement for maximum traction.

Setup power is provided by a 16 horsepower gasoline engine driving a gear pump, which in turn provides power to cylinders and hydraulic motors in the setup circuit.

All hydraulic valves are firmly mounted on the trailer and the oil reservoir is part of the trailer frame. Most of the controls involve solenoid valves and in some cases, the switches that operate these valves are used in more than one location, although separate mounting positions are provided in each case. A single control operates the Wheel drive, hydraulic dynamic braking, and hydraulically operated mechanical brakes. The hydraulically operated loading platform is raised independently, but lowered automatically whenever the control to operate the Wheel hydraulic driving motors is engaged. Hydraulic fluid is carried in heavy wall steel tubing, high pressure thermoplastic hose, or two-wire braid high pressure Neoprene rubber hose.

The trailer is equipped with conventional crank-type landing gear at the rear and each has a low speed and a high speed shaft. The same type of landing gear is used on the front of the trailer, but each is driven by a hydraulic motor. Under emergency conditions, the hydraulic motors can be disconnected and the landing gear cranked down by hand, using only the low speed shaft. Each landing gear is equipped with a swiveling pad at the bottom and laminated wood blocking is provided for use under the front landing gear, where the loads are the greatest.

Each seat on the Wheel swings freely on pins at the ends of the spokes, which are spaced from each other by rim sections and spoke crossbars. The Wheel is internally braced by spoke cables and cross cables. The ends of the spokes next to the axle are pinned to each other in a "chain", one end of which is permanently attached to the hub and the other end is pinned in place when the Wheel has been completely opened. The hubs are supported by the main axle riding in a sealed, self-aligning bearing on the tops of the towers. Each tower is a hinged structure that is braced front to rear by the trailer frame, kneebraces and corner guy cables. It is braced on the outside by a windbrace and two windbrace crossbars.

The windbrace on each side of the trailer telescopes through a 27 inch range, to accommodate variations in ground slope and will lock in every quarter inch extension through the entire 27 inch range. The windbrace crossbars will swivel to lock into the windbrace at any of these positions.

Entrance and exit stairs on each side of the rear end of the trailer are self-contained and fold up intact over the top of the rear end.

The HY-5 II BIG ELI WHEEL is designed for easy erection witha two-man crew. One who has seen or operated a standard BIG ELI Wheel, will find many similarities in the HY-5 II, but there are enough differences that he should familiarize himself carefully with these instructions before beginning the assembly. Safe erection must be the foremost consideration in everything that is done. The hydraulic winch and cylinders will remove most of the hard work from Wheel erection, but they must be used properly, or the equipment can be damaged or worse, someone injured. Do not be concerned with speed because as one becomes familiar with the operation, the speed will come naturally.

LOCATION

In deciding where you want the HY-5 II to stand and which way you want it to face, you will need a fairly level spot for erection. To erect the HY-5 II, a space of 39 feet deep and 27 feet wide is required. This space must clear of branches and wires for a height of 46 feet; to allow ample clearance of the ride for carrying passengers. Not only must the Wheel be clear, but overhead obstructions must be far enough away so that passengers cannot reach out and grab them.

The built-in leveling equipment on the HY-5 II will accommodate substantial slope in any direction, but of course, the more level the spot is, the easier the erection and operation will be. If the slope is beyond the range of the leveling equipment, then some blocking may be necessary. If the ground under the trailer rear end or the windbraces is soft, it may be necessary to block under them in order to spread the load out to maintain a firm footing for the HY-5 II. Sometimes the blocking will shift down at an angle so that it is not flat. The

swiveling pad on the bottom of the landing gear can accommodate some slope in this way, but if it becomes too severe, the telescoping landing gear leg could get pinched so that it cannot be moved. If this should happen, put some blocking under the trailer frame close to the landing gear, retract the landing gear so that the weight is carried on the other blocking, relocate the blocking under the swiveling pad and extend the landing gear again. Blocking for the front landing gear is provided. Footings that are not firm, can cause the Wheel to tilt and this could be very dangerous. Therefore, be doubly careful that all footings are firm. The weight of the trailer-mounted/hydraulic HY-5 II BIG ELI WHEEL and all necessary equipment is 28,000 pounds.

ASSEMBLY AND DISASSEMBLY OF THE HY-5 II BIG ELI WHEEL, WITH CHECK LISTS

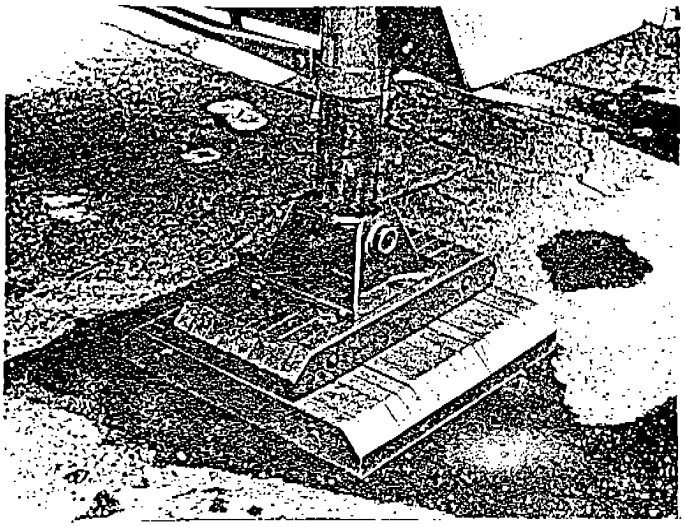
HY-5 II ASSEMBLY PROCEDURE

1. The wooden pads for the front landing gear are stored on the floor toward the rear of the trailer, secured with tarp straps hooked into the expanded metal flooring. Remove the tarp straps and position a pad under each front landing gear. (Picture #1)

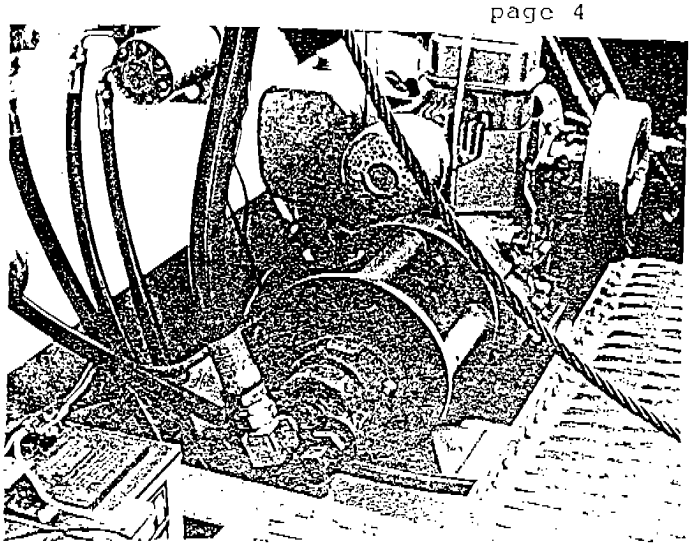
2. The power cable should be lifted out of the front end of the trailer floor. It can be connected to the terminal box at the left side of the trailer, just ahead of the trailer axle. Since it will not be needed until later, this connection can be made prior to step #38.

3. The power source for all setup operations on the HY-5 II is the 16 horse-power gasoline engine driving a gear pump. Never start the engine unless there is sufficient oil in the reservoir. Check the oil level in the sight glasses on the right end of the tank. When the trailer is level and the Wheel folded, oil should appear in the top sight glass. With the towers raised, the oil level will drop because of the large volume of oil flowing into the two triple-extension cylinders which raise the towers. The oil level can also be checked by removing the breather cap on top ofthe tank. The oil should show in the bottom of the strainer basket when the oil is at the highest level. To get into the tank, the cover plate to which the breather cap is attached can be removed. This end of the tank is where all oil returns. Removing the cover plate at the other end of the tank, will provide access to the three suction strainers for the three suction lines. The hydraulic system has two basic circuits; one for setup and the other for operating the Wheel. They are completely independentof each other, except for having a common reservoir.

   Start the gasoline engine that powers the setup hydraulic pump (Picture #2) The control valve for the landing gear is located in the forward end of the trailer on the left side, mounted to the inside of the main trailer beam. (Picture #3) When you lean over the side of the trailer, the valve handle on your left controls the left landing gear, the one on the right operates the right landing gear. Move the handles in the direction that you want the trailer to move. In other words, if you want to raise the trailer with the landing gear, to disconnect the tractor, pull up on the handles.



Picture No. 1



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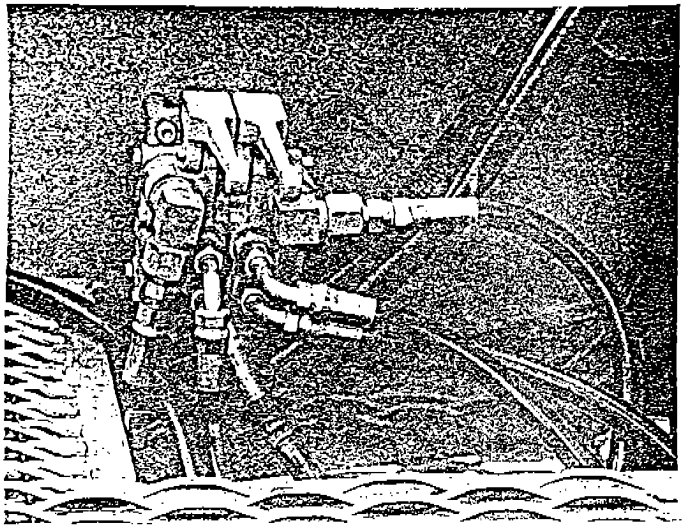

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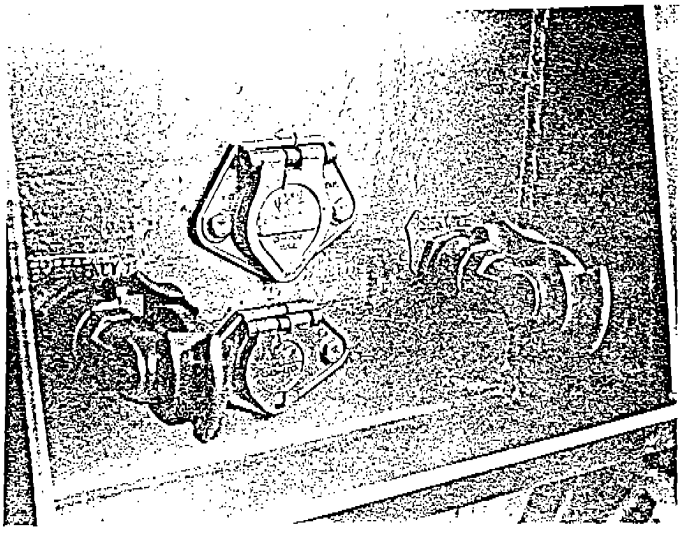

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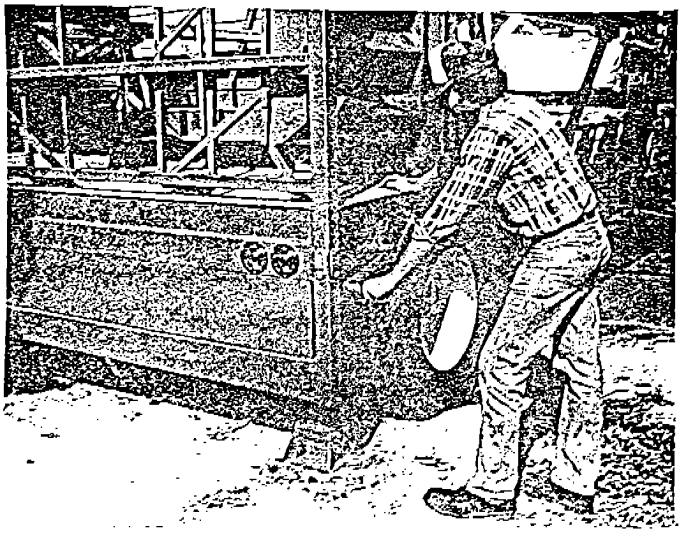
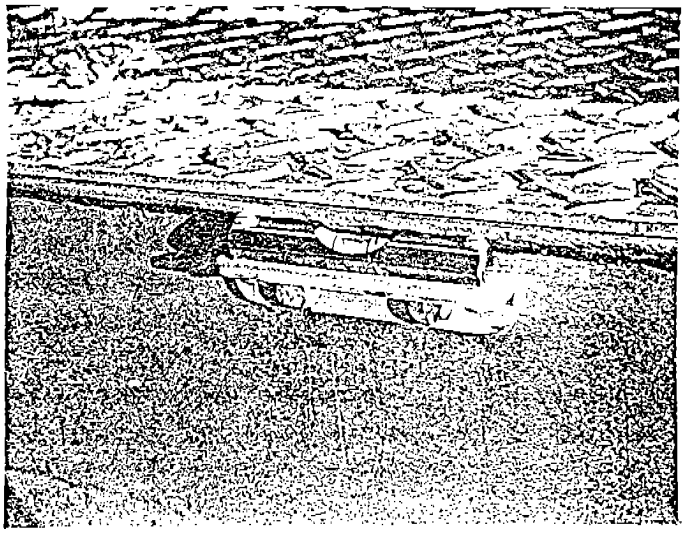


Picture No. 5



Picture No. 6

NOTE: THROUGHOUT THESE INSTRUCTIONS, LEFT, RIGHT, FRONT AND REAR REFER TO THE DRIVER'S POSITION WHEN HE IS SEATED BEHIND THE STEERING WHEEL OF THE TRACTOR; WHILE THE TRACTOR AND TRAILER ARE ON THE HIGHWAY, UNLESS OTHERWISE SPECIFIED.

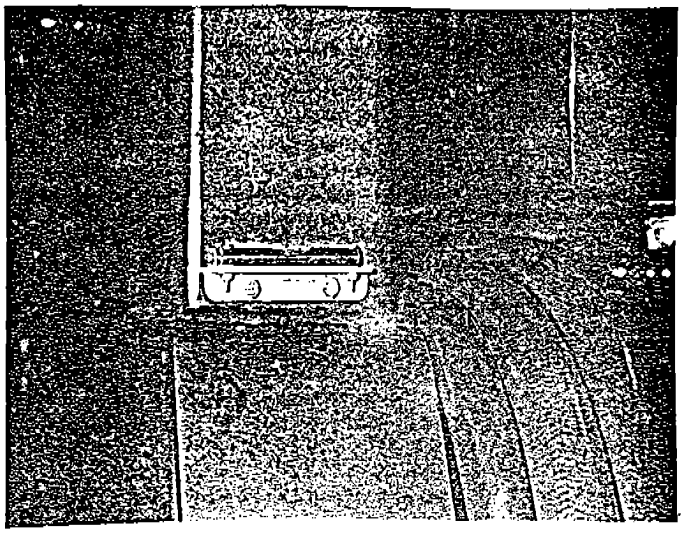
Do not use the hand crank on the front landing gear unless the hydraulic motors operating them are uncoupled. The only reason you should ever need to do this would be failure of the engine or hydraulic motors to operate. In this case, by disconnecting the hydraulic motors the landing gear could be hand cranked.

The landing gear is operated through a worm gear reduction. Normally, this type of gearing is self-locking, but if you should see any sign that the landing gear is not holding as it should, it is very likely that the gears are showing wear. You should contact the factory immediately. This is a standard design commercial landing gear, proven in service, although any kind of equipment will show wear in time, and the possible effects on the self-locking characteristics of this worm gearing could be hazardous. If it started to turn, this would allow that landing gear to retract, tilting the Wheel. Therefore, it is extremely important that this worm gearing be in good condition. When you first receive your HY-5 II, check the backlash of this worm gearing, when new, by turning the crank both ways, observing how far the handle must be turned before the landing gear begins to move. As wear develops, you will see more backlash and this procedure will give you some idea of how much wear there is.

4. When the load has been lifted off of the tractor's fifth wheel, unlock the kingpin, disconnect the gladhands for the airlines, pull the electrical connector and drive the tractor out. Notice that the front end of the trailer is equipped with both small and large electrical connectors. (P #4)

5. At this time, the trailer should be leveled. First, crank the rear landing gear down by hand until the rear end load is well supported by the landing gear. (Picture #5) It is not necessary to raise the tires off the ground. In fact, there should be considerable weight on the tires when you are through. The main thing is that the trailer be stabilized so that it cannot bounce up and down, which might occur if the load were carried only by the tires. Adjust the landing gear from side to side until the bubble level on the rear end of the trailer shows that it is as level as you can get it. (Picture #6) Then level the front of the trailer. There are two different bubble levels: one measures the front-to-rear level (Picture #7) and the other measures the side-to-side level. It is important that the side-to-side levels on both front and rear be as closely adjusted as you can, because this will affect how the rest of the structure fits together. There is no substitute for accurate side-to-side leveling. The front to rear level is for your information, but is not important in the assembly of the ride, or its operation so long as the walking surfaces for the passengers are reasonably level.

6. The folding stairs at the rear of the trailer (Picture #8) are secured with a tie bar connecting their highest points. Remove the tie bar and and each stair can then be folded down into operating position. (Pic. #9) The stairway is not very heavy, but is a little awkward to handle and it would be wise to use two persons to lower each stairway.



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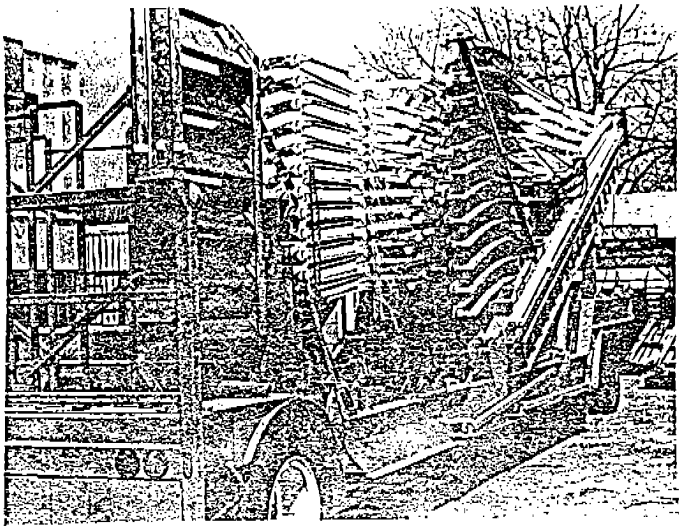

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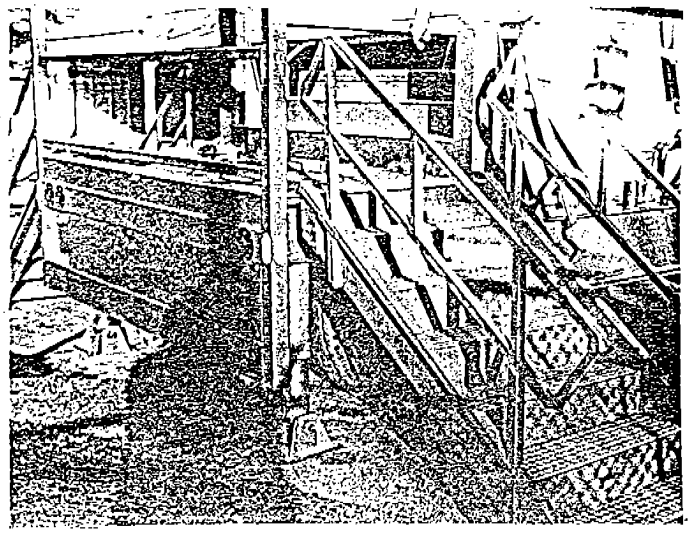

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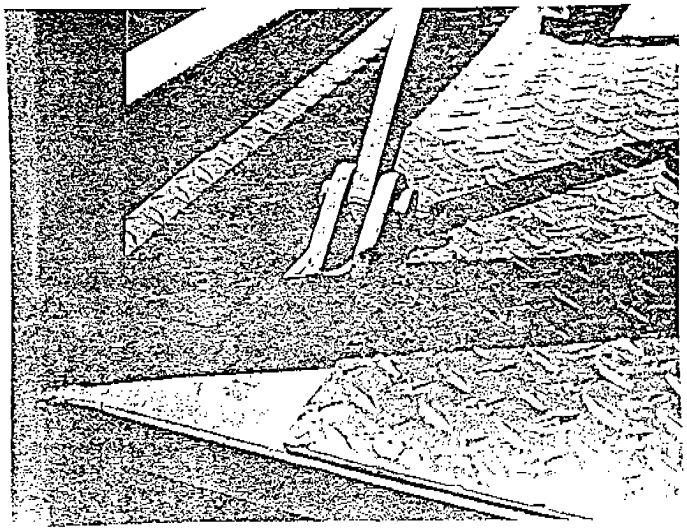
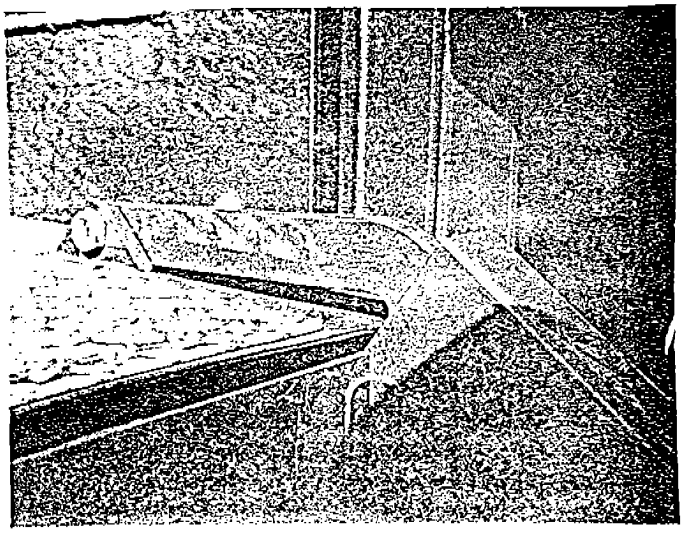


Picture No. 10



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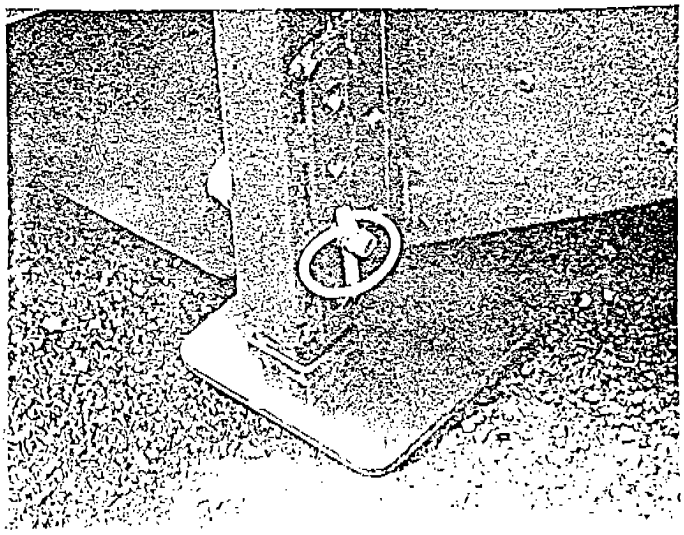


Picture No. 12

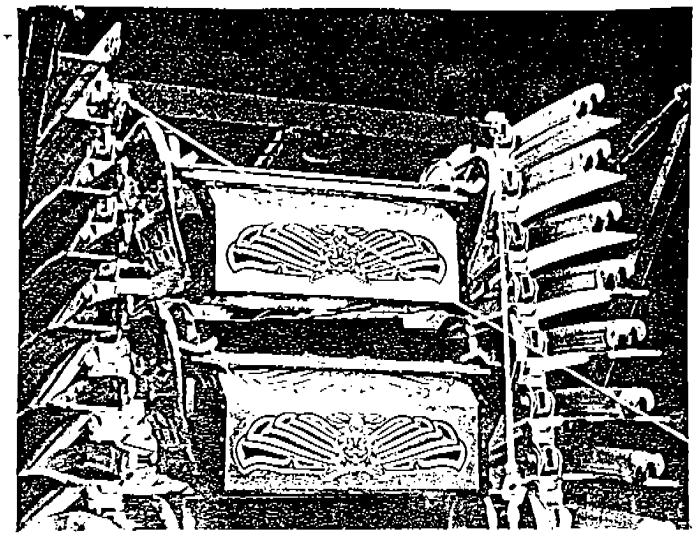
The hinge bar on each side of a stairway pivots on a pin on the floor of the trailer (Picture #10). Where this hinge bar passes over the edge of the floor, be sure that there is always some space in between (Picture #11) If there is none, the edge of the floor or the hinge bar itself could become bent. The adjustable feet on each stairway will allow you to position the stairway so that there is clearance under the hinge bar. (P. #12) The various holes in the telescoping tubes will permit you to lock the feet in a number of differing heights. Select the holes that most closely line up, insert the locking pin, and secure it with a Klik pin. If you find that the holes do not give you enough adjustment, then it may be necessary to put some blocking under the feet. Ordinarily, this should not be necessary.

7. Unpin the operator seat post from its inner stowed position, swing it halfway around, and pin it in place. Whenit is positioned for the operator to use while running the ride, it is situated so that he can sit on the seat and be clear of the turning Wheel. However, it is sticking out beyond the side of the trailer and must be turned around to stay within the overall width of the trailer before traveling on the highway.

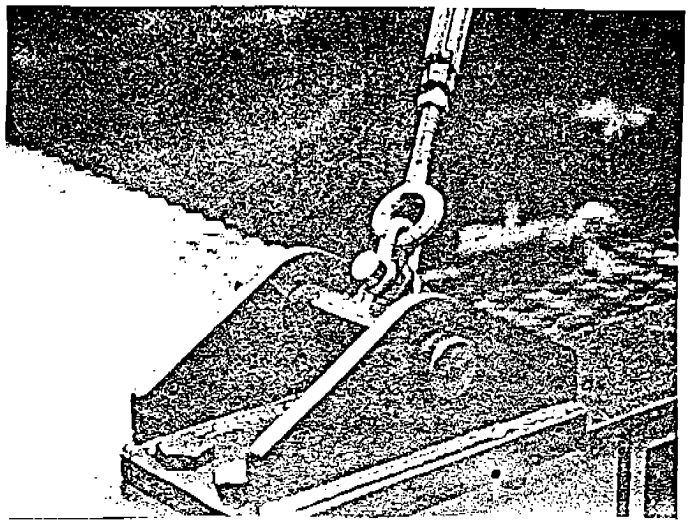
8. The spoke stack is sway-braced with cables on the rear to minimize sway from side to side while traveling on the highway (Picture #13). Loosen the jam nuts on the turnbuckles, open up the turnbuckles, and remove the pins securing the lower ends of the cables. These cables will not be needed again until you are folding the HY-5 II down. They can be left connected to the singletree attached to the top spoke of the spoke stack, with the lower ends hanging loose. Occasionally, when the towers are being raised or lowered, the tube connection on the end of the cable (Picture #14) will become hooked in the expanded metal flooring. If this should happen, it could break a cable. To prevent this from happening, pin the tube end of the cable to the hole in the drive rim extending out from the #3 seat. This will keep it up out of the way and prevent snagging on the floor.

9. The winch cable is secured to the axle with a short length of small cable, and the cables attached to the front end of the A-frame are connected to that piece of cable with a tarp strap. Remove the small cable. The prop pole at the rear of the A-frame has a pin at the top which fits into a hole on the bottom side of the A-frame, and the cable hanging down from the top of the A-frame is pinned to the tabs on the side of the prop pole. Disconnect the cable, push up on the A-frame so that the prop pole can swing forward out of the way and down to the top of the cover over the electric motors.

10. Open up the folded A-frame (Picture #15) and connect the ends with the cables that are attached. You should be able to push the A-frame around the main axle; if you cannot, then the bolts fastening it around the main axle can be loosened slightly. The A-frame should never be so loose that it will swing freely, but neither should it fit so tightly that it cannot be turned by hand on the main axle. The A-frame must be able to shift under the winch cable load for the best distribution of the loading. An A-frame that is too tight may jump or jerk under load, and this can put heavy loads on the structure. The winch cable must now be between the



Picture No. 13



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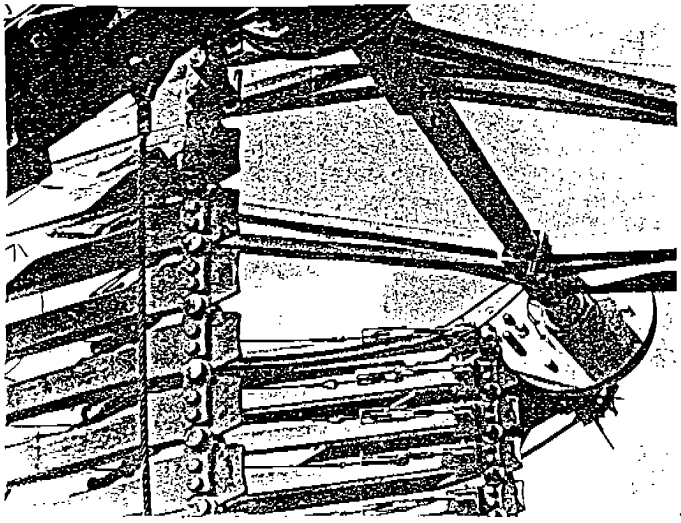

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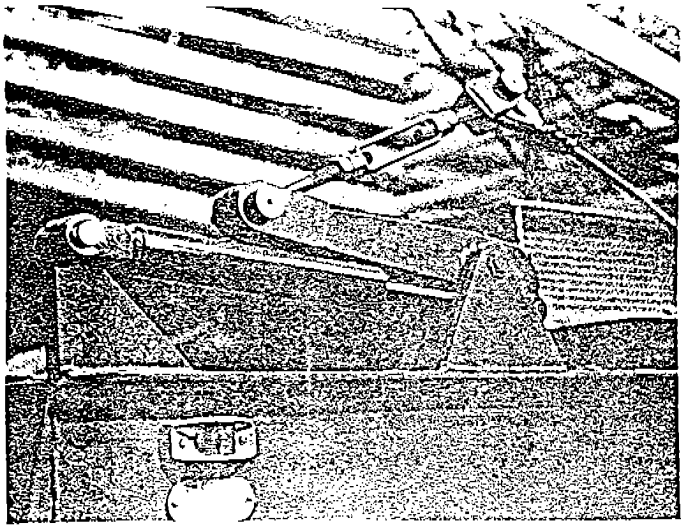

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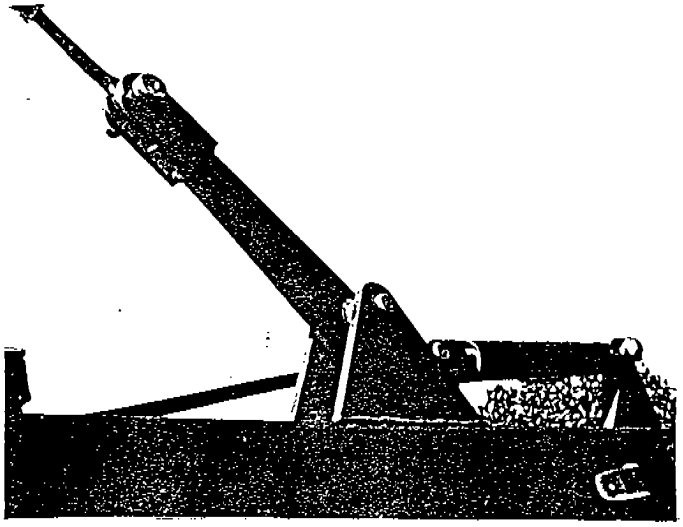

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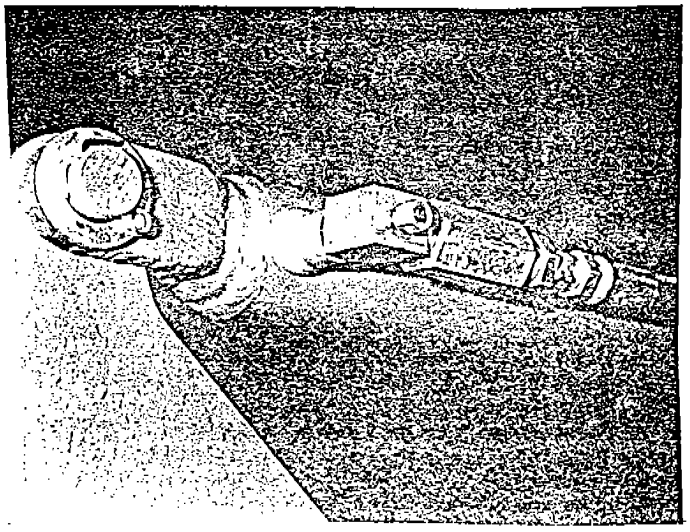


Picture No. 18

guide plates of the A-frames.

11. There is a shock absorber on each side of the trailer at the front end. These are necessary to minimize shock to the entire structure when the towers are raised. The way that the spokes and seats are positioned on the towers causes a weight shift over center when the towers are nearly to their upright position. When the towers reach that position, they will move ahead rapidly to the full upright position with heavy impact unless slowed by the shock absorbers. The shock absorbers will do an effective job if they are kept filled with oil and are properly "cocked" before the towers are raised. To "cock" the shock absorbers, pull the long lever as far forward as possible, so that the rod of the cylinder is fully extended, as shown in Picture #16. This will tend to draw oil in behind the piston inside the cylinder. However, the oil flowing into the cylinder must pass through a small hole, and it may take several minutes for the oil to flow through the small hole and fill up the cylinder. It is very important that you allow enough time for this to happen or the shock absorbers will not do what they are supposed to do. The oil comes from a small reservoir mounted high on the front sides of the tower support tubes; when they are in their lowered position. The oil level in each reservoir should be showing in the sight glass. It is recommended that you allow 10 minutes for the cylinders to fill. If you will "cock" these shock absorbers when you disassemble the Wheel, they will be ready for use when you want to raise the towers.

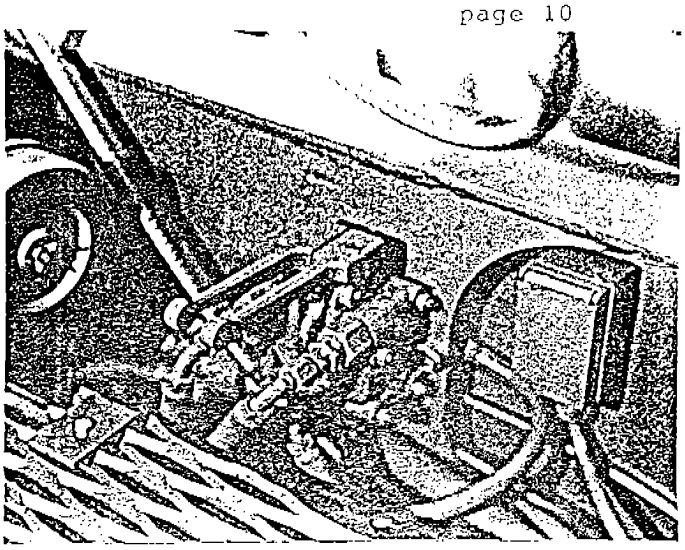
    When the towers are raised and the load comes on the corner guy cables, which connect the long levers to the tops of the towers, the long levers can rotate only as the oil escapes from the cylinder through a small hole; as the cylinder rod retracts to the fully opened position. (Picture #17) This is what provides the shock absorbing, so you must not forget to "cock" both shock absorbers at this time. There is an air bleed port on the shock absorber (Picture #18) for removing air from the system.

12. Be sure that the front corner guy cables connected to the shock absorbers are in the clear and will not get hooked around anything as the towers are raised.

13. The winch is operated with a push button switch that is stored in the tool box under the operator's position. Slide the switch post into the sockets on the forward end of the right seat rack. (Picture #19) Pushing the "UP" button will wind the cable on the drum and the "DOWN" button will cause it to unwind. Unwind the cable all the way and extend it out in front of the trailer. Be sure that it will not hang up on anything as the towers are raised. The first stage of the triple-extension cylinders are powerful enough to raise the weight of the entire trailer, and the cable breaking strength is less than the force these two cylinders can produce. If the winch cable is not run all the way out, it is very likely that the cable will be broken, and other damage to the structure may occur. So, do not forget to unwind the winch cable.

14. The two valve handles for controlling the triple-extension cylinders are on the right side of the trailer; opposite the landing gear controls. (Picture #20) As you lean over the side of the trailer, the handle to your left controls the left cylinder, and the one to your right controls the

Picture No. 19



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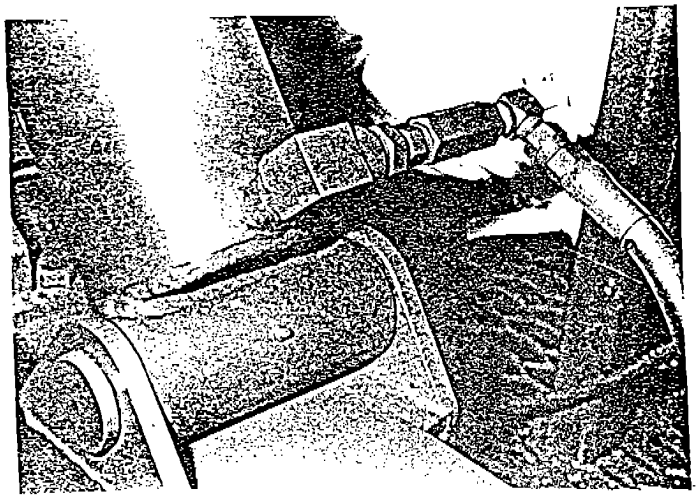

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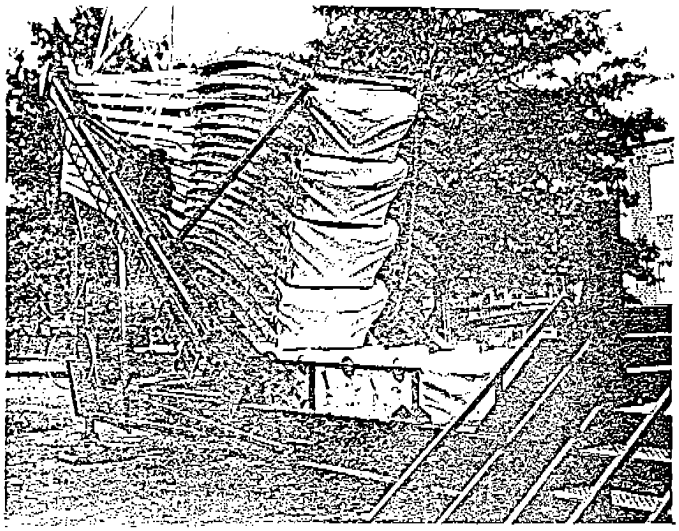

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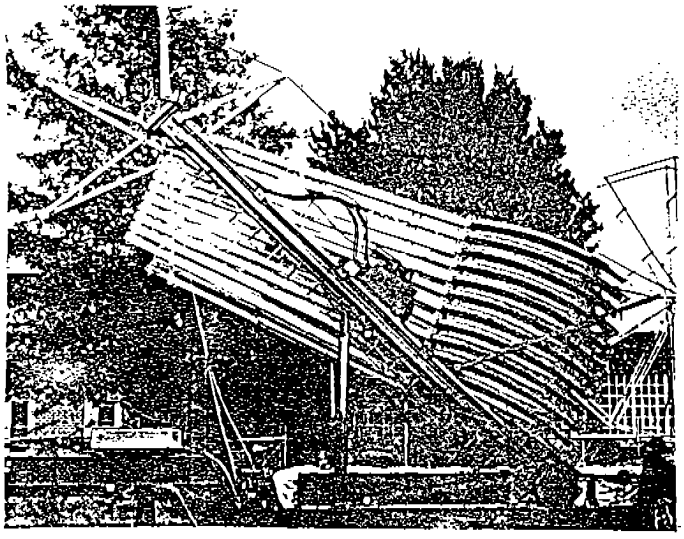

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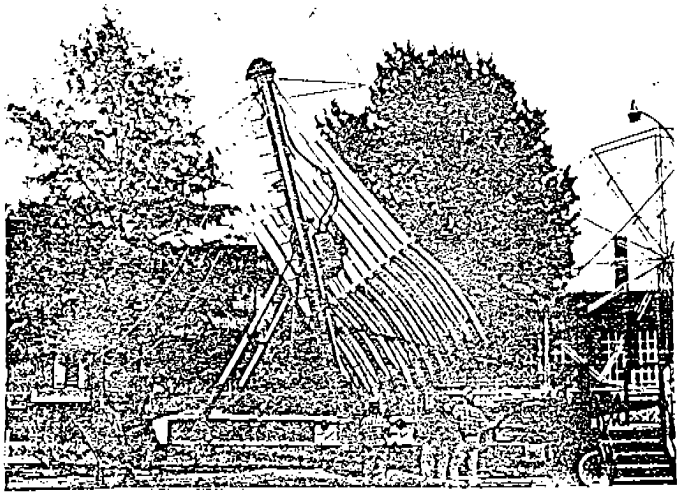


Picture No. 24

right one. Raise the handles and both cylinders will begin to extend. Apply just enough pressure to lift the towers slightly off of the tower posts. Withthe pressure still on the cylinders, loosen the bleeder at the top of each cylinder and let out any air that may be present. You will probably not get a full flow of oil, but you may get some air. It is advisable to hold a bucket over the bleeder, because the air and oil under pressure will spew out of the bleeder port. Be sure to tighten the bleeder port when you are through letting the air out. If you see the towers spring up and down when the valves are closed rapidly, it is a clear sign that there is air in the cylinder; it will not be springy if it is just filled with oil.

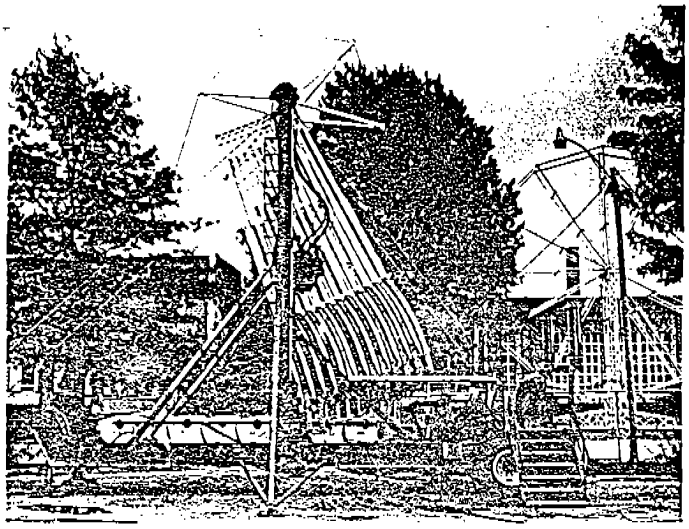
Normally the two cylinders will extend together, but it is important that both towers raise at the same time. The bearings on the tops of the towers are self-aligning, so that you do not need to keep them exactly even, but if one tower gets too far ahead of the other, it could cause twisting or bending of the spokes. If you see that one is getting ahead of the other, use the control handles to bring them back together; by easing off on the control handle of the cylinder which is ahead. In all the years we have been using these cylinders, we have never had a hose failure reported to us, but this, of course, is always a possibility with any kind of hose. Before raising the towers and extending these cylinders, check to see that all of the hoses are in good condition. Do not attempt to raise the towers if you find a hose in poor condition. A hose failure will cause a loss of hydraulic pressure, allowing that tower to come down. However, there is a small orifice in a check valve at the port of the triple-extension cylinder (Picture #21) which allows oil to flow through at a controlled slow rate. This will give you enough time to keep the other cylinder dropping at about the same rate. Release the handle controlling the cylinder with the broken hose, which will close off oil flow from the pump to that hose. Of course, the six gallons of oil that may be in the cylinder will continue to pour out slowly until the towers are all the way down.

In raising the towers, the 5 inch diameter first stage of each triple-extension cylinder will move out first, followed by the 4 inch diameter and finally the 3 inch diameter stage. (Picture #22, 23, 24 & 25)

15. The rear kneebraces are suspended by the rear corner guy cables. Disconnect the cables (Picture #26), lower the kneebraces, and pin them to the tab connections on top of the trailer main beam (Picture #27). These pins have two diameters, so they can only be installed with the pin heads toward the outside. These shoulder pins are used so that minimum force will be needed in driving the pins in or out of the holes. Lock each pin with a Klik pin.

16. The corner guy cables lie on top of the hose covers (Picture #28) and are restrained by guide blocks. Release the cables and then pin them to the tab connections on the vertical posts near the loading platform (Pic. #29). Lock each pin with a Klik pin.

17. The front kneebraces are hinged in the middle (Picture #30) and a single shoulder pin will lock each one in operating position. Get underneath and push up with a shoulder to align the holes before inserting the pin. The head of each pin goes toward the inside; next to the Wheel. Lock each



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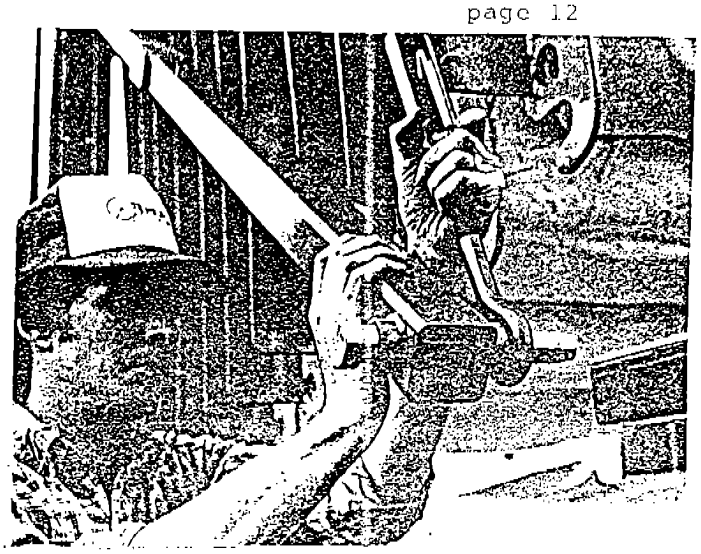

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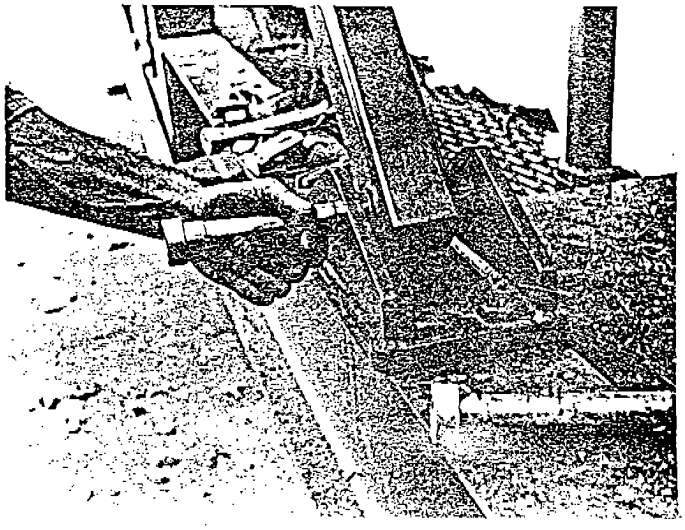

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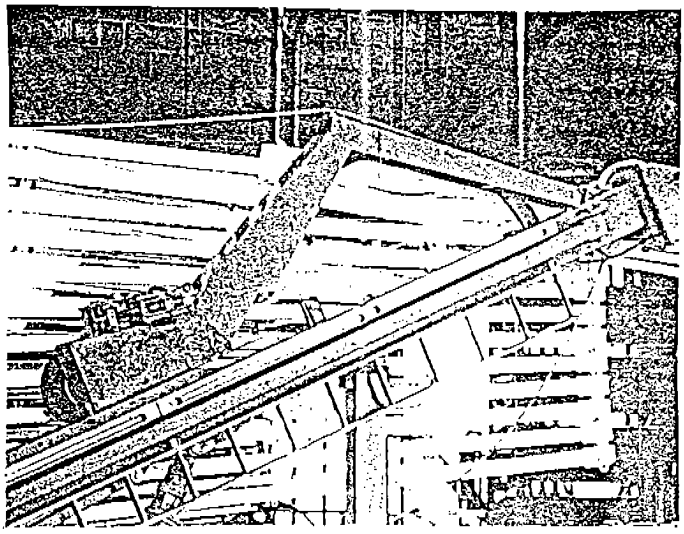

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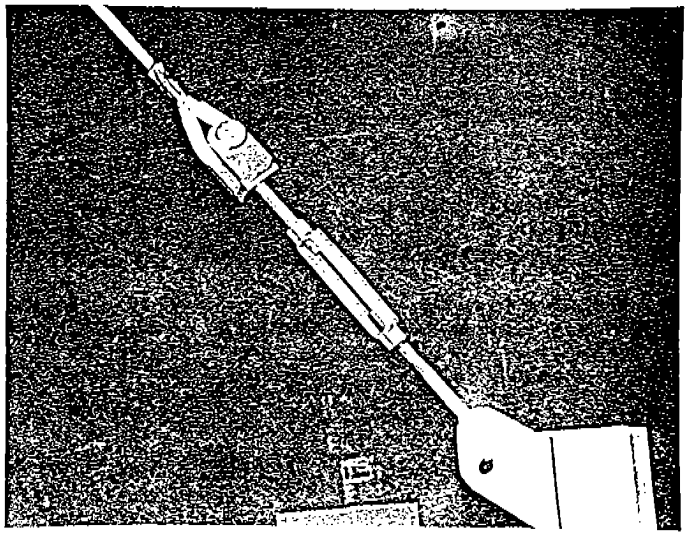

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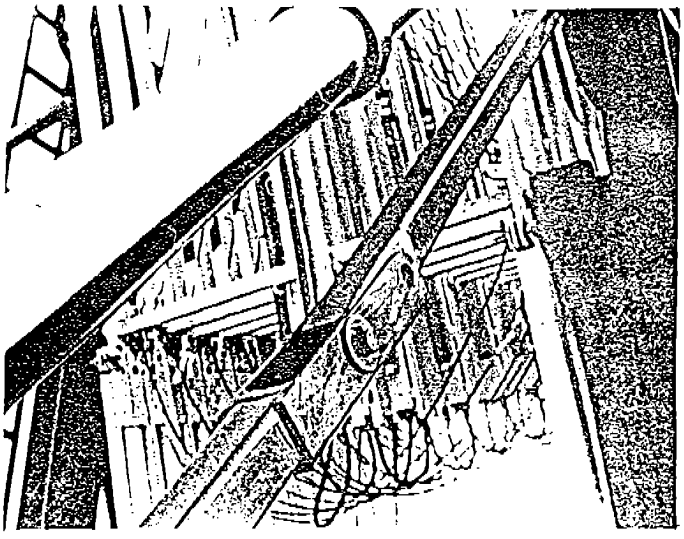


Picture No. 30

pin with a Klik pin.

18. Check to be certain that the tower pin holes are in line, and then insert the tower pins. These are two-diameter shoulder pins, and the head is to be on the outside of each tower. Secure each pin with a snapper pin.

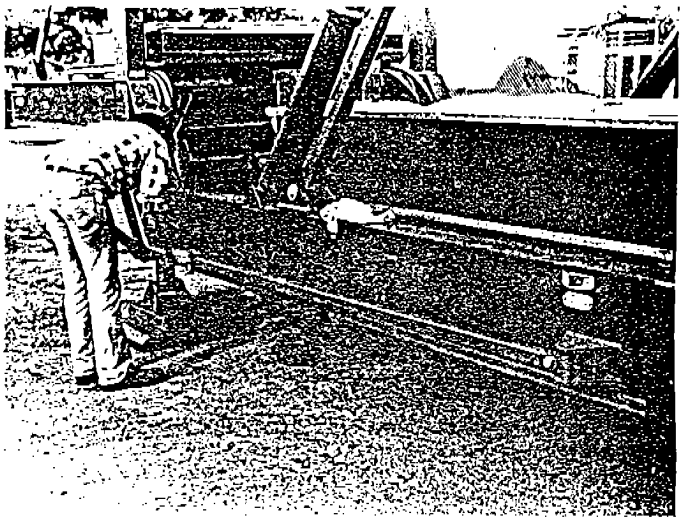
On the rear side of each tower, just above the main trailer beam, there is an adjustable downstop. The purpose of this downstop is to locate the tower precisely so that the tower pin can be driven in and out easily. Normally, the adjustments made at the factory should never need to be changed, but if you find that the holes in the tower plates do not line up with each other, the tower can be moved up or down by adjusting these bolts. The jam nuts should always be left tightened so that the adjustment will not change.

19. The windbrace feet are stored in the storage boxes in the front end of the trailer. Lift them out and position one on each side of the trailer. The windbrace crossbars are pinned to the outside of the main trailer beam. (Picture #31, 32 and 33) They should be unpinned and swung around to drop into each windbrace foot. The windbrace crossbar is equipped with a double pivot where it is connected to the side of the trailer (Picture #34), so that it will pivot both vertically and horizontally. Shift the windbrace foot as needed to align the holes.

20. The windbrace is pinned to the outside of the tower (Picture #35). Remove the pin (Picture #36) and bring the bottom end out and down over the windbrace foot, where a single pin will connect the windbrace, windbrace foot and two windbrace crossbars in a common joint (Picture #37). The windbrace is made of telescoping square tubes and the inner tube is counterweighted for easy handling. The counterweight is suspended by a cable inside the tube. Occasionally, the cable gets in the way of the pin being driven in, so be sure the pin is in the clear before you drive it in or you may cut the cable. There is a series of holes in each tube, arranged so that the windbrace can be locked in position every quarter inch, for a total adjustment range of 27 inches. Find the holes that are most closely aligned. You can bring them into exact alignment by turning the adjusting screw on the windbrace foot. That screw should be centered vertically before you start so that you can adjust both ways. When the holes are lined up, drive the pin in and lock it with a Klik pin (Picture #38).

21. Clearances between the Wheel and the towers are quite close and you may find that the spoke stack is hanging too close to one tower. Loosening a screw on one windbrace foot and tightening the screw on the other one, will move the tops of the towers toward loosened side (Picture #39). If you find that you run out of adjustment with these screws when doing this, remove the windbrace locking pin and select a different set of holes that will allow you to make the adjustment you need.

22. Each work platform is stored on the side of a seat rack. First, install the two pins for each work platform so that the long end is pointed away from the trailer. One pin goes through the middle of the rear kneebrace, and the other goes through the pin connection on the vertical post near the loading platform. Lock each pin with a large hairpin cotter.



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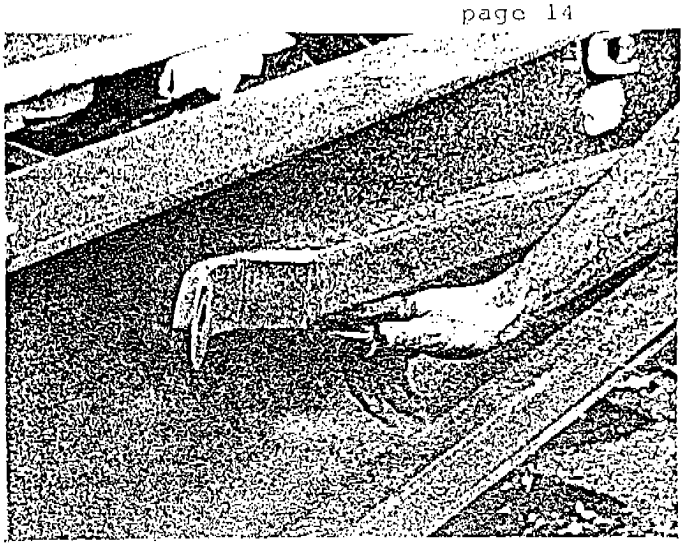

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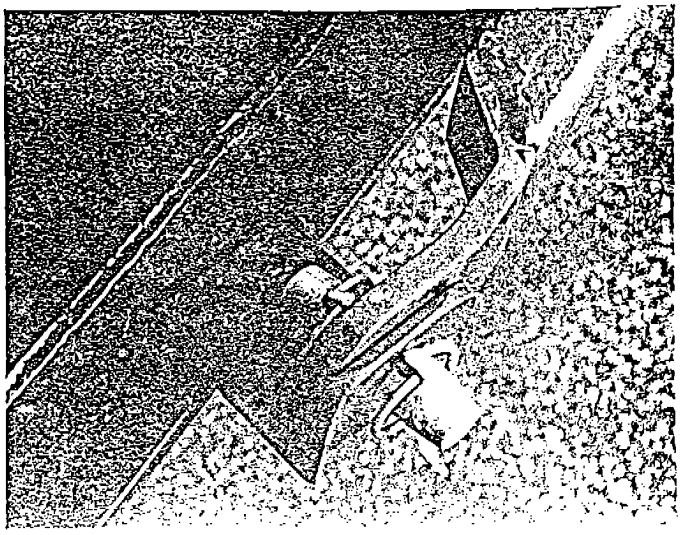

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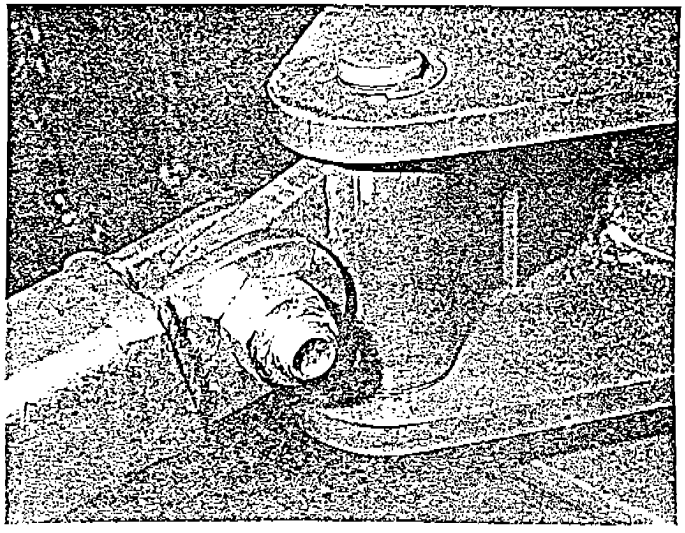

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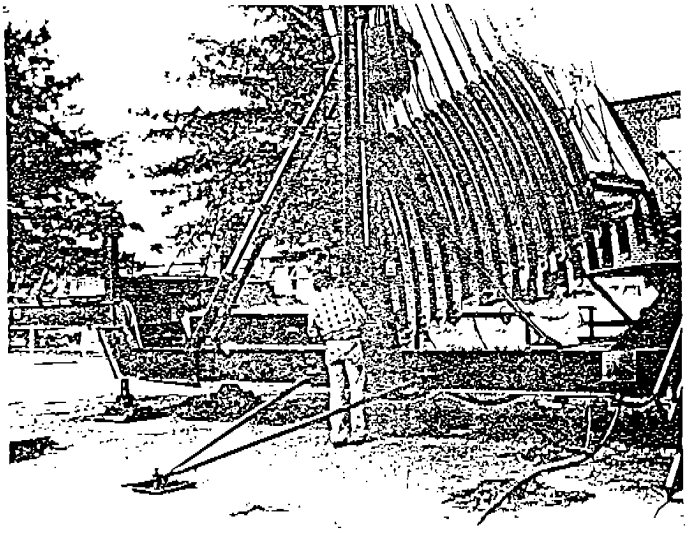

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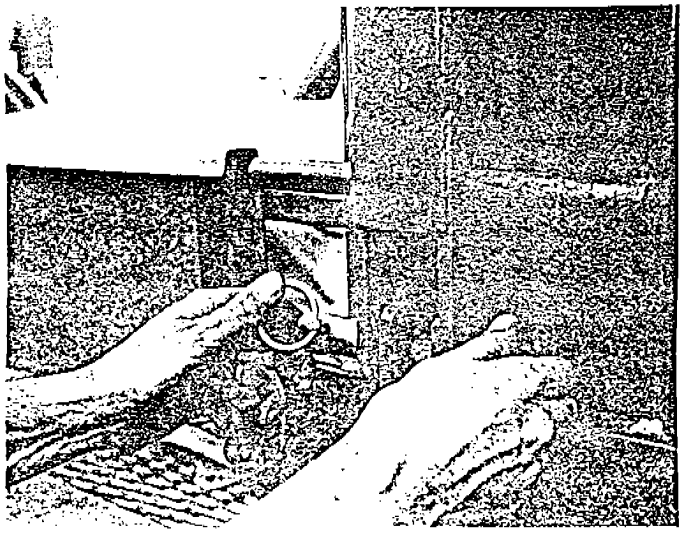

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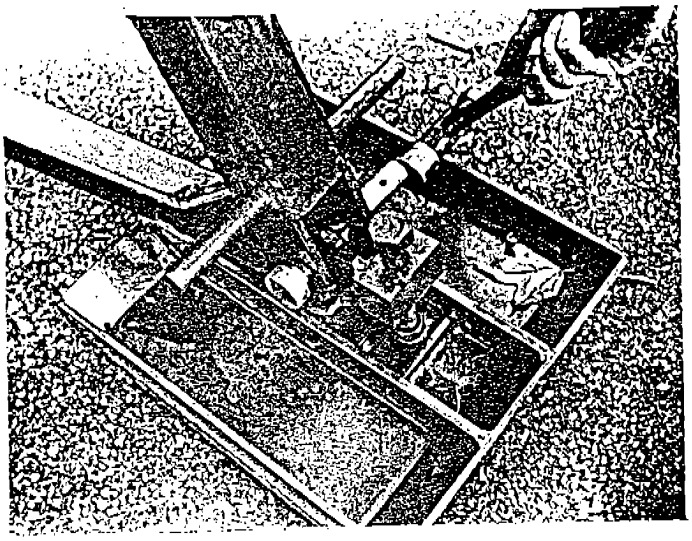

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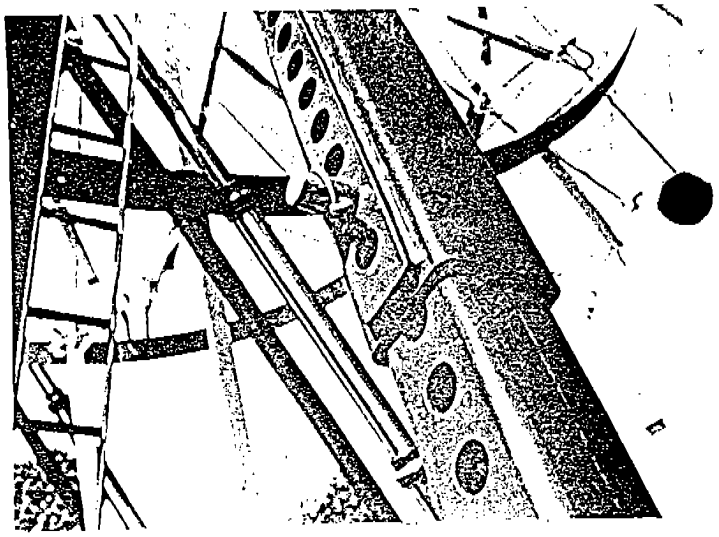

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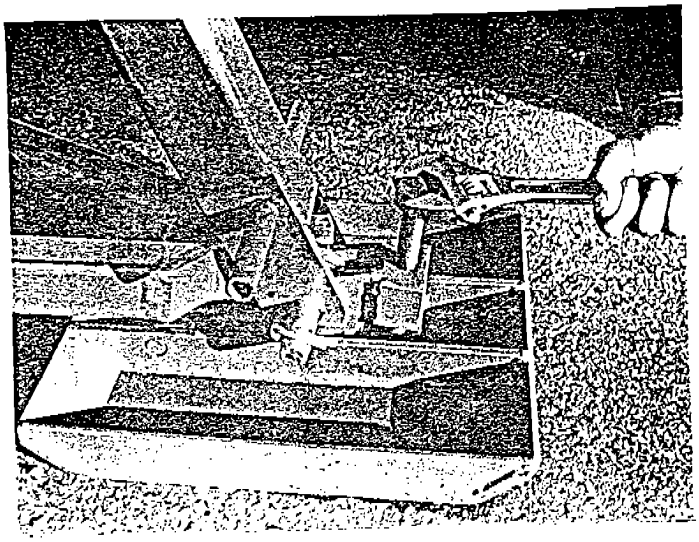

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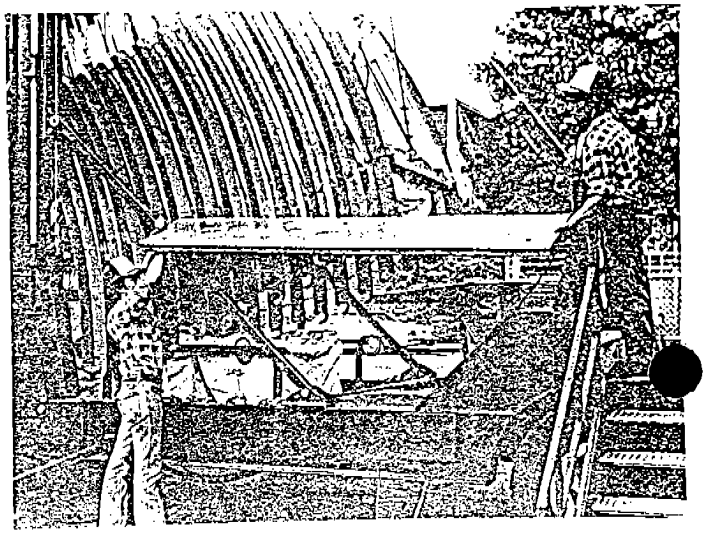

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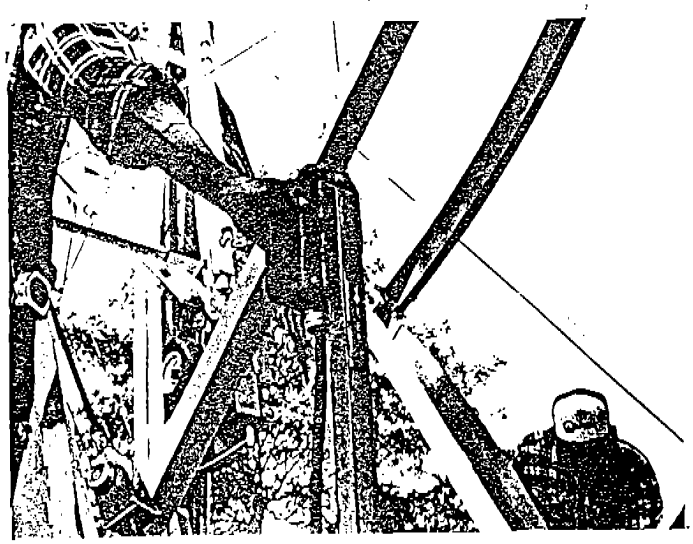

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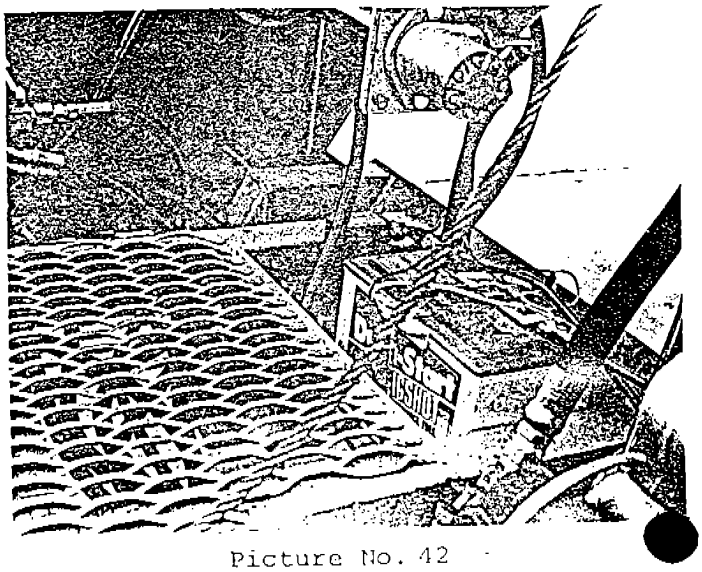


Picture No. 42

Slide the work platform over the outer ends of these two pins, with the work platform tilted (Picture #40), so that the inner pin connections will go over the tops ofthe vertical post and rear kneebrace pin connections. Then on the other side, slide it back onto the ends of the two pins. Insert a large hairpin cotter in the remaining hole in each pin, preventing the work platform from sliding off of the pin. The holes in the work platform pin connnections are intentionally made oversize so that the platform can be tilted as you put it in place.

23. Disconnnect the up/down pushbutton switch that is located on the right seat rack, slide it out, and re-install it in the vertical socket of the left work platform. (Picture #41) Plug it in down below. The switch is now in a convenient location for operating the winch from the left work platform.

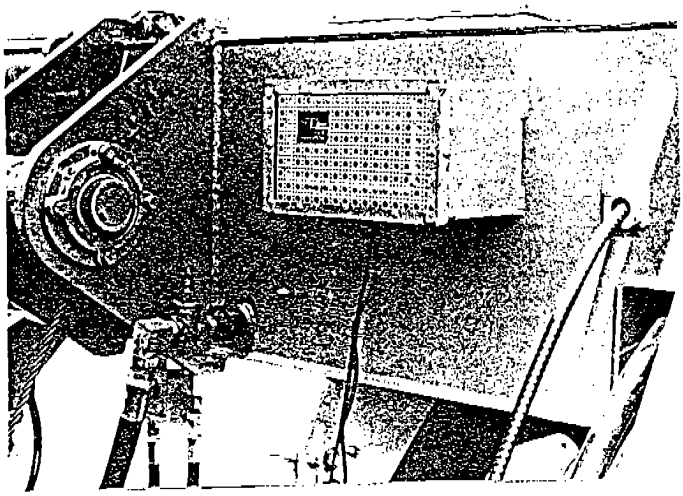
This switch operates a 12 volt DC solenoid hydraulic valve which controls the winch. Power comes from the 12 volt battery on the engine (Picture #42) and the battery charger (Picture #43) connected to it, so it is not necessary to have outside electrical power for this control. The engine should be started at this time.

24. The winch cable is already connected to the singletree which is pinned to the master spoke (Picture #44). Check to be certain that a locking pin with a Klik pin is in place on each end of the singletree, so there will be no danger of the singletree disengaging. Also, be certain that the winch cable is securely fastened to the singletree. All nuts on the cable clamps were tightened to a torque of 45 ft-lbs. Check them often for tightness. This cable is proof tested at the factory before it is installed, but it is a vital element in the Wheel erection and must be in good condition.

Push the "UP" switch and the winch cable will tighten. The A-frame provides leverage over the axle and the cable pulls on the lower end of the master spoke, opening the Wheel.

25. At this point, the entire spoke stack is resting against the two spoke rests sticking out from the tower (Picture #25 and 45). As the Wheel is unfolded, the remaining spokes climb higher and higher on these spoke rests until they are clear above them. The spokes could then swing forward, possibly getting jammed in the spoke rests, although this is much more apt to occur during disassembly than in assembly of the Wheel. To prevent this from happening, spoke pullback cables are provided. One end has a hook that hangs over the bottom seat pin (Picture #46) and the other end has a flat hook that engages a slot in the vertical surface to the rear of the loading platform. With both spoke pullback cables in place, tighten the turnbuckles until the entire spoke stack has been pulled clear of the spoke rests. This will eliminate any possibility of the spoke stack swinging back over the tops of the spoke rests.

26. As the master spoke is unfolded, some of the other spokes may want to move with it. Push back on the other spokes and the folding rims will then begin to drop down. When the spoke has been pulled out all the way, continue tightening the winch until the second spoke just begins to move. Then push down on the rims until they are in a straight line and install the two pins in the center joint. (Picture #47, 48, 49 & 50) These pins are also two-diameter shoulder pins for easy insertion and the heads of the pins are



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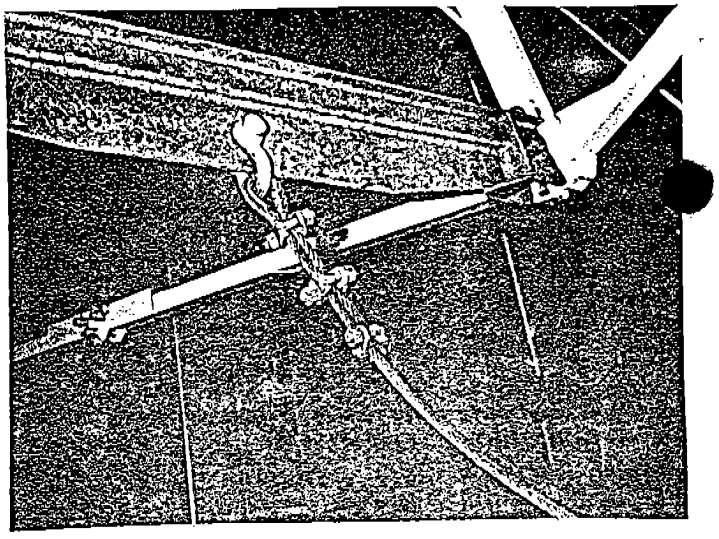

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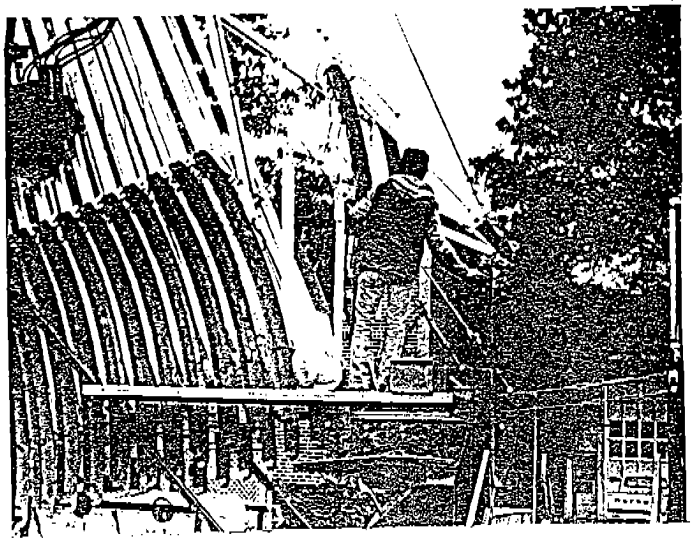

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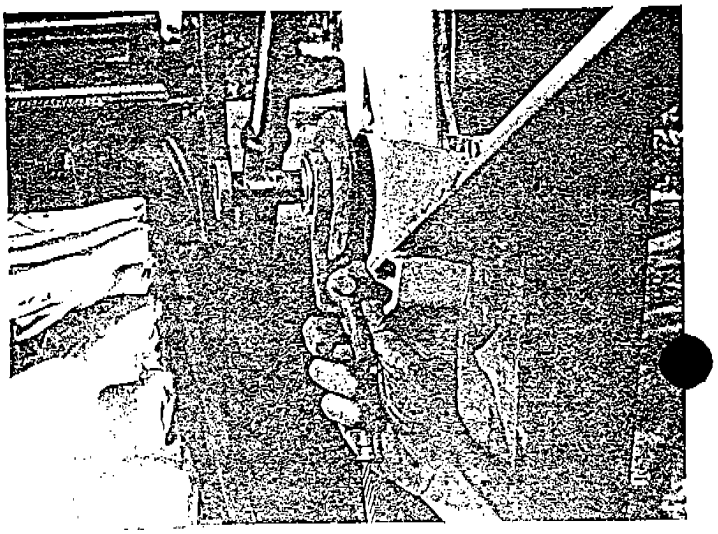

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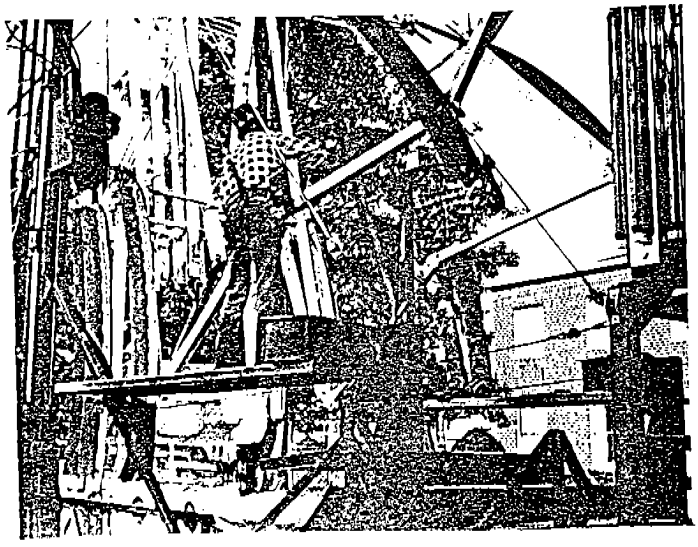

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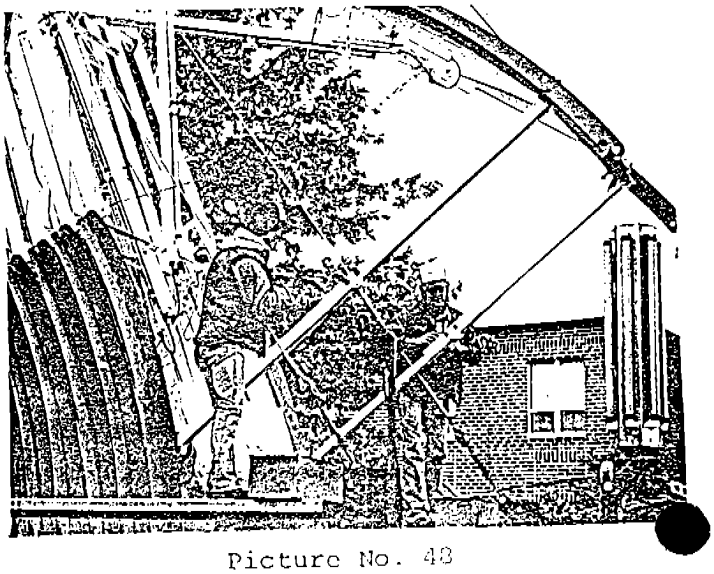


Picture No. 48

to be toward the outside. Lock each pin with a Klik pin.

27. The next spoke carries the #12 seat. It is restrained in position with a long wire hook that engages an eyebolt on the spoke crossbar, which is connected to a flat padded hook that engages the bottom of the seat. This seat restraint has two purposes: a) to keep the seat from swinging excessively while traveling on the highway; and b) to keep the seats from bumping into each other during assembly and disassembly. It must always be used on each seat that stays on the Wheel, or damage is likely to occur.

    Rotate the front of the seat down to put slack in the seat restraint, unhook it from the spoke crossbar (Picture #51), then the hook at the bottom of the seat will come off easily (Picture #52). It is not necessary to get on the other side of the seat to do this; it is to be done while standing on the loading platform facing toward the front of the trailer and looking at the front of the seat ahead of you. The reason for this is that you should never get inside between the opened and folded spokes. In the event that the winch cable or its connections should fail, the unpinned part of the Wheel would fold back down. Anyone in between the seats would be crushed. We believe our equipment has as excellent margin of safety, but we also believe that it is wise not to put yourself in a position where you must rely on such equipment, if you could just as easily be in a position where you do not have to count on it.

28. Continue opening the Wheel and pinning the rims as you come to them (P #53, 54 and 55). Try to align the rim holes before inserting the pins, because if you drift the parts into line as you drive the pin in, you may put excessive loading on the pin connections and bend the plates.

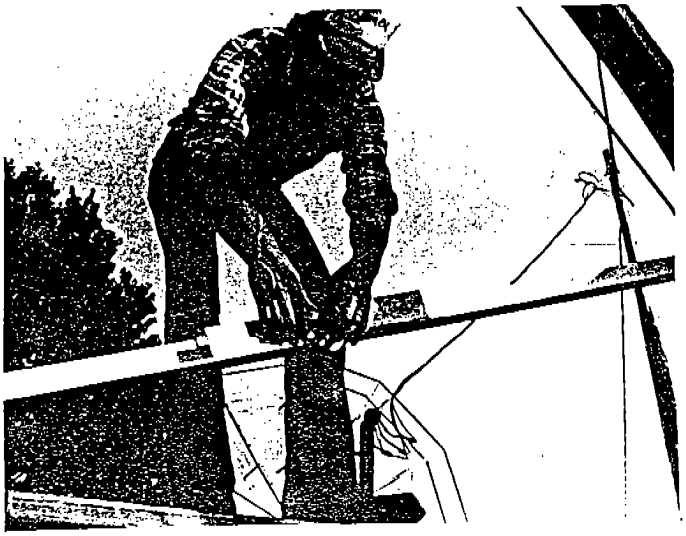
29. The star light panels within the Wheel are self-positioning. As the Wheel opens, the lower ends of the light panels have tracks on them that engage rollers on the spoke crossbars (Picture #56). Be sure that as you open the Wheel, the cross cables or the electrical jumpers do not hang up on part of the Wheel; they should always be checked to be certain that they are in the clear.

30. Clearances between the aluminum drive rims and the towers are very close. Sometimes they will rub against each other if the towers are not plumbed properly. If you find that the drive rims are closer to the tower on one side than the other, this can be adjusted with the screws on the windbrace feet.

31. The last rim sections are separate from each other (Picture #57) and the two halves must be brought together and connected with two pins. The winch (Picture #58), because of its location, cannot pull the Wheel all way around, so the split rims will be on the bottom. When the singletree is as close as it can get to the winch, the only way to let the Wheel continue to turn is to slack off on the winch cable.

    Each rim half is pinned to the spoke it is hinged on. Pin the rims and then you can stand on the rim to connect the cross cables (Picture #59). Only one pair of cross cables does not stay connected all of the time.

32. Unhook the spoke pullback cables and store them away in the storage box



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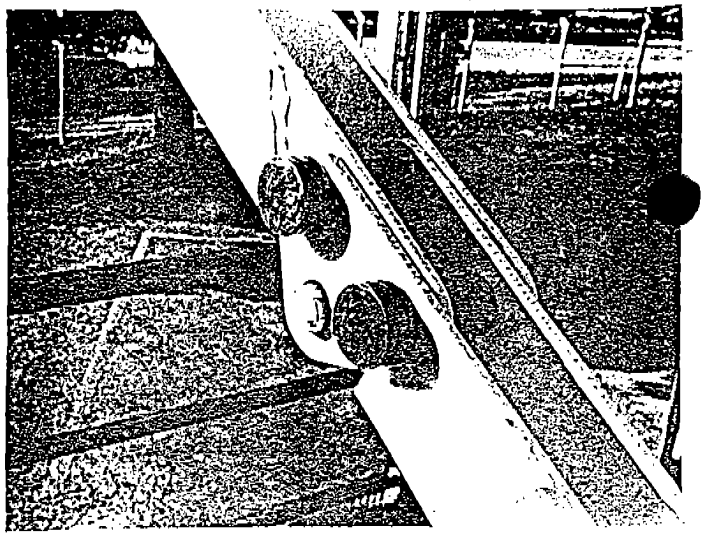

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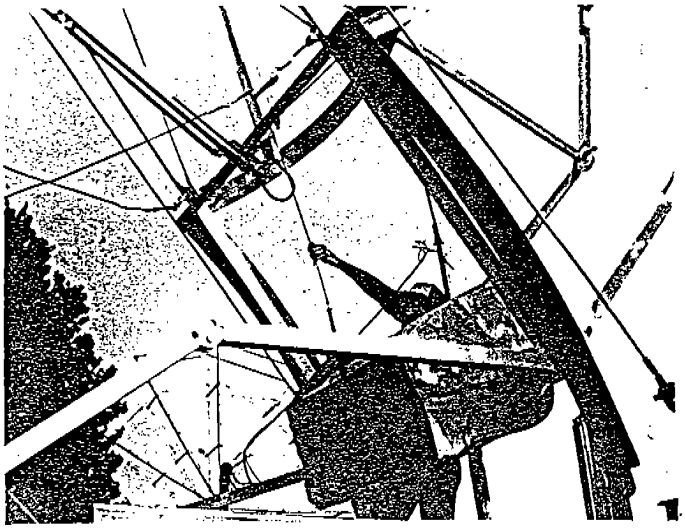
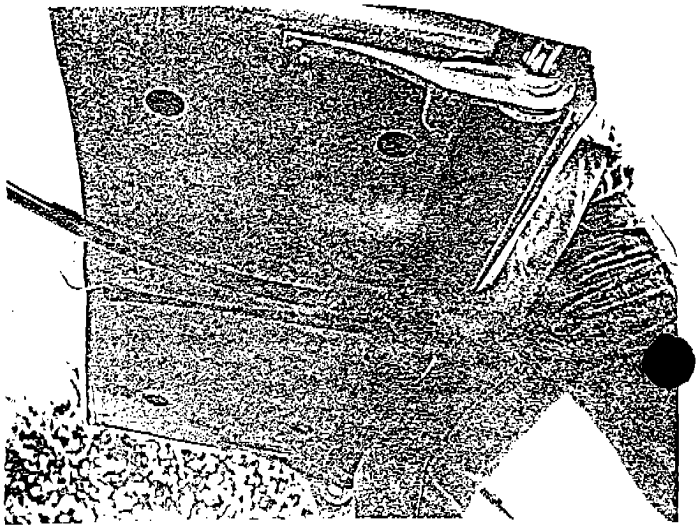


Picture No. 51



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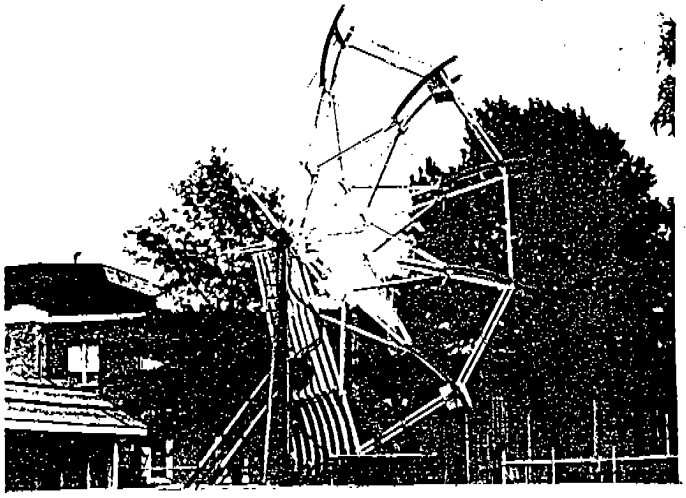

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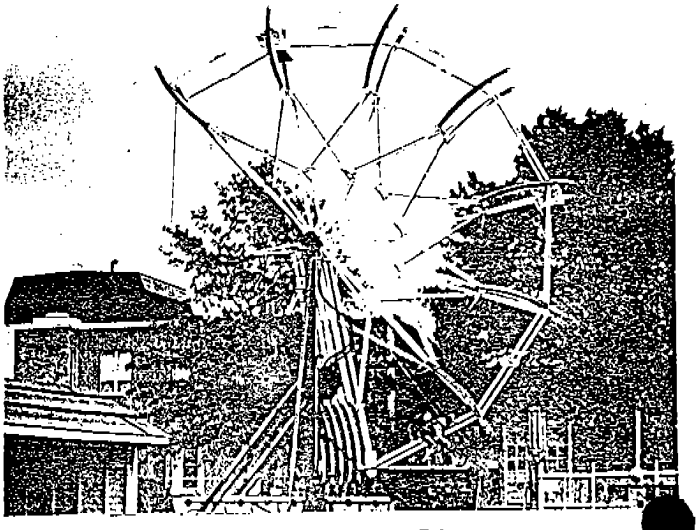

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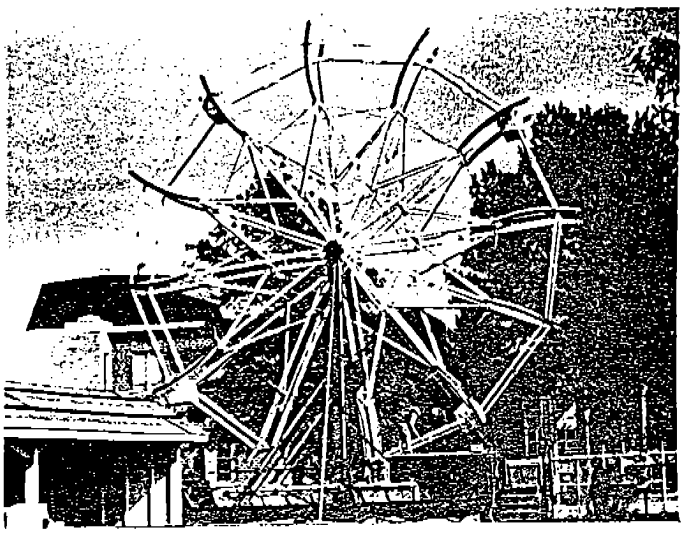

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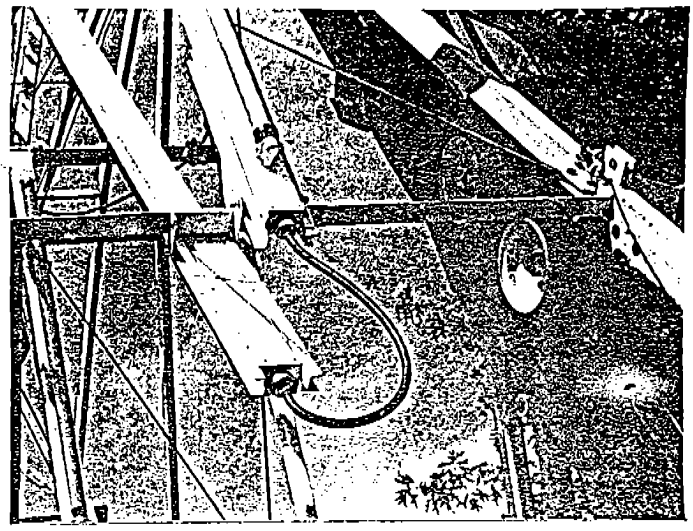

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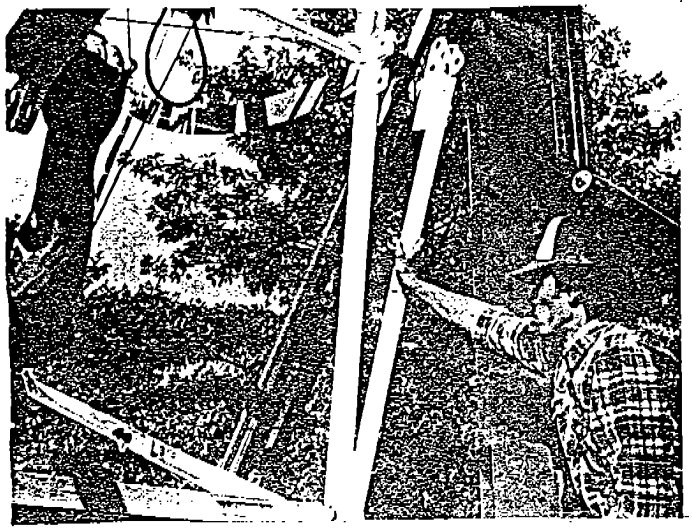

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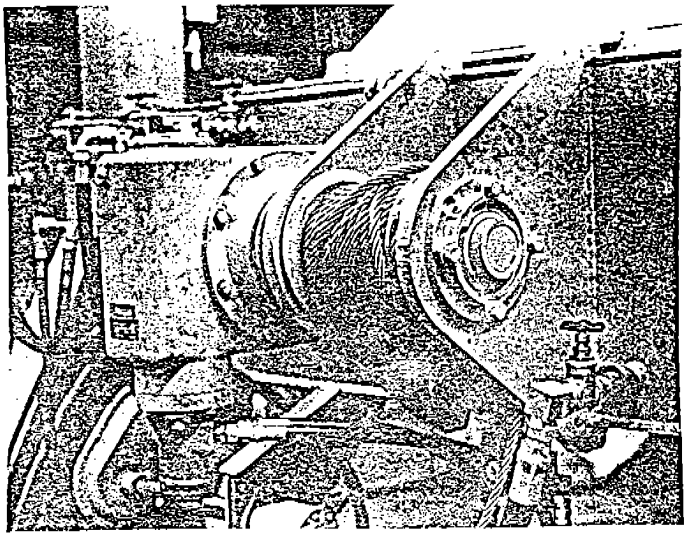

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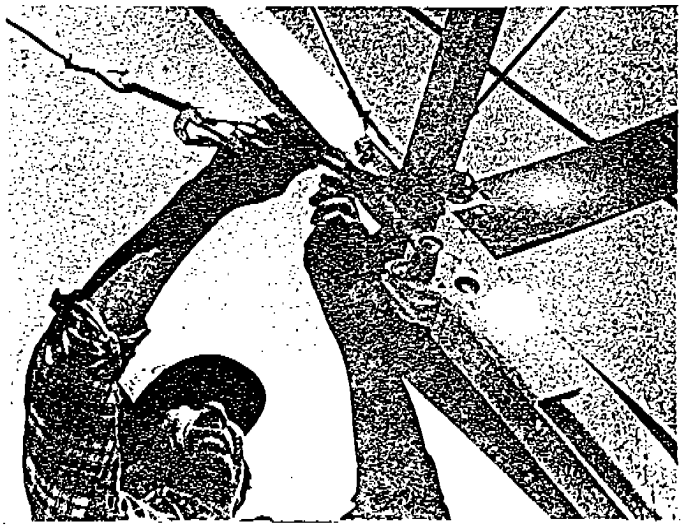

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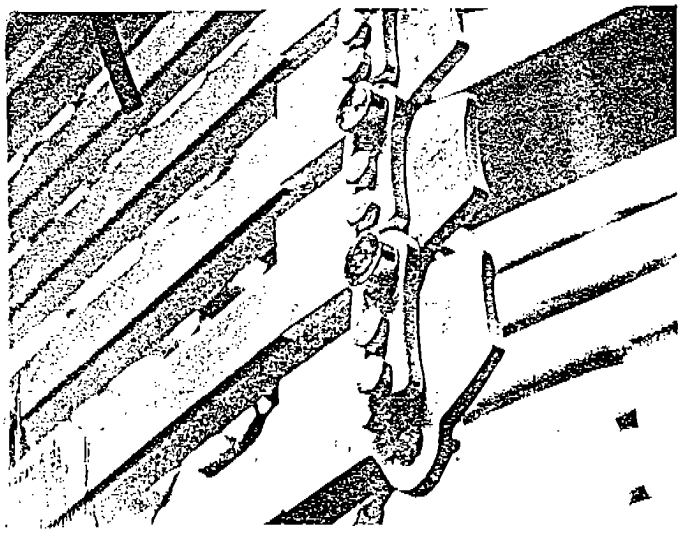


Picture No. 60

toward the rear of the trailer. Remove the singletree and wind up the winch cable. Feed the cable evenly onto the winch drum so it does not cross over itself. Remove the spoke rest from each tower.

33. Climb a tower and insert a single hub pin to lock all the spokes to the hub. The hub pins are located in their own storage slots on the front sides of the towers. Lock each pin with a Klik pin. The head of the pin should be next to you when you are standing on the ladder. It will be necessary to turn the Wheel until the pin hole is in the clear before you will be able to drive the hub pin in. All of the spoke tenons are interconnected in a "chain" (Picture #60). One end of the "chain", at the master spoke, is permanently connected to the hub. As the Wheel is fanned, the spoke tenons feed into a continuous slot in the hub and the "chain" wraps around the outside of the hub. When the Wheel is fully opened the final link in the "chain" is in line with the remaining hole in the spoke tenon, where the pin is to driven in and then locked with a Klik pin.

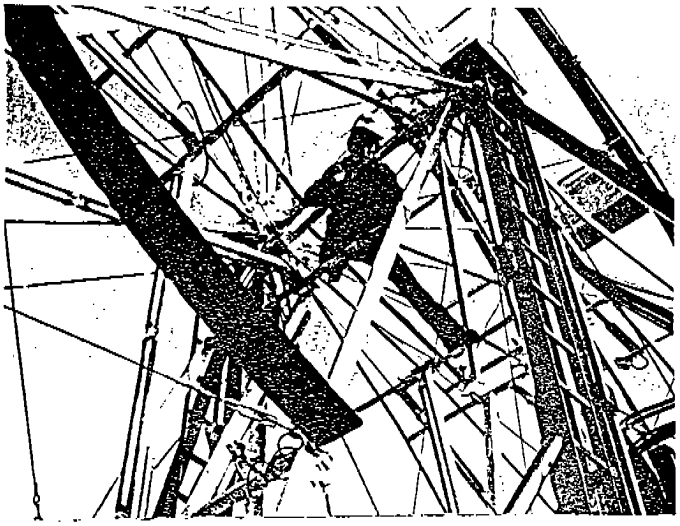
34. While you are up the towers, step over inside the Wheel onto the top spoke crossbar (Picture #61). Reposition the two light panels that cross between the master spoke and the last spoke. These two panels have a handle on the upper end. Unlock each panel, lift it and swing it across to the opposite spoke crossbar (Picture #62) and lock it in place. These are the only light panels which must be individually repositioned on the entire Wheel. There is an end stop on the lower end of both panels so you do not need to be concerned about pulling the light panel track off the rollers on the bottom spoke crossbar.

Never operate the Wheel unless both of these light panels are in operating position. In the stowed position, the outer end of the light panel extends further than in the operating position. The lip of a footbottom can catch on the light panel. If this happens, the seat will turn upside down, at great hazard to the passengers. THIS HAS HAPPENED; DO NOT LET IT HAPPEN TO YOU.

There are electrical jumpers which are wound around the top spoke crossbar. Unwind them and connect them into the light panels to complete the lighting installation.

35. Before installing the drive, the Wheel should be trued. Adjustments may not be necessary, but the Wheel should be checked at this time, because it is difficult to make proper adjustments after the drive is installed. The rubber tires grip the drive rims firmly and attempting to pull a spoke one way or the other with the long spoke cables will be almost impossible. The only thing that can be done in that case is to make an adjustment on the cables, then turn the Wheel a few times to permit the drive rims to "walk" to one side as the tension of the spoke cable direct. It is much easier to do the truing before the drive is ever put on. Ordinarily, no further adjustments will need to be made until the next setup.

First of all, check to see that the two sides of the Wheel are parallel to each other. From the end of the trailer, sight across the spoke crossbars and the main axle from a point of view where they are closely in line with each other (Picture #63). If the two sides are not parallel, you will see the spoke crossbars standing at an angle on one side of the Wheel and at opposite angle on the other side. The two sides of the Wheel need to



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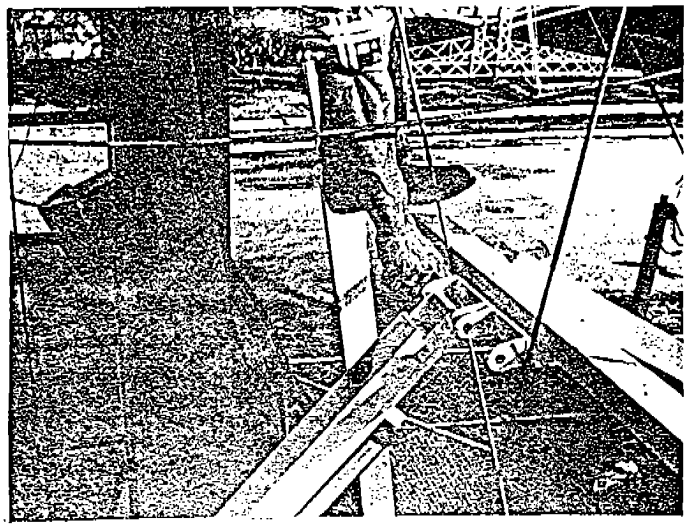

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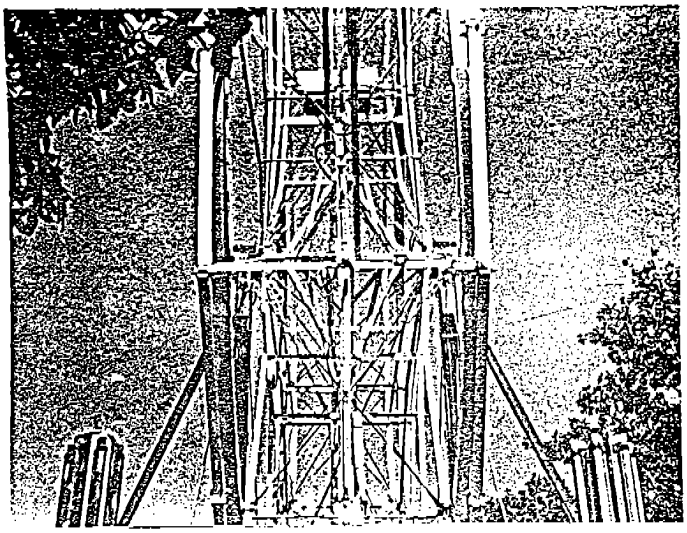

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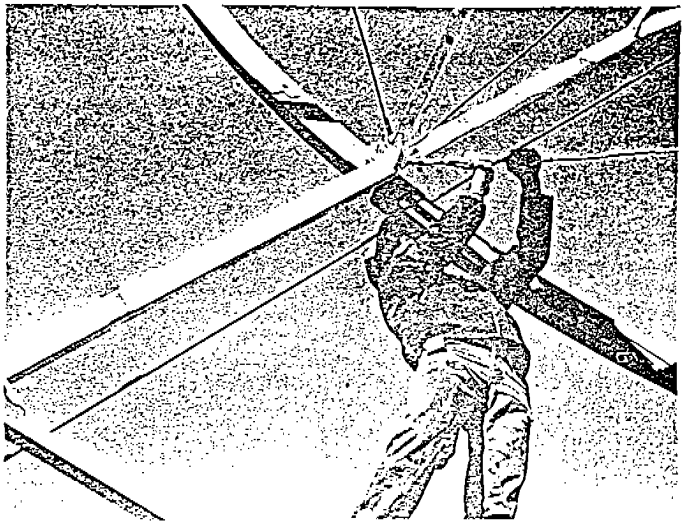

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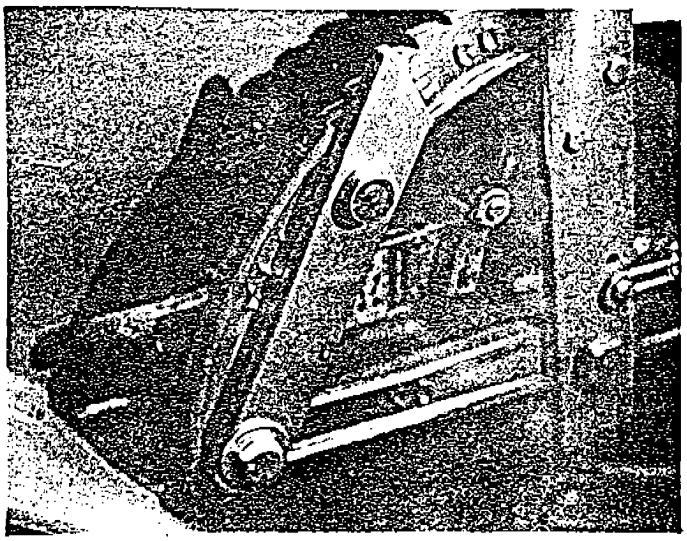

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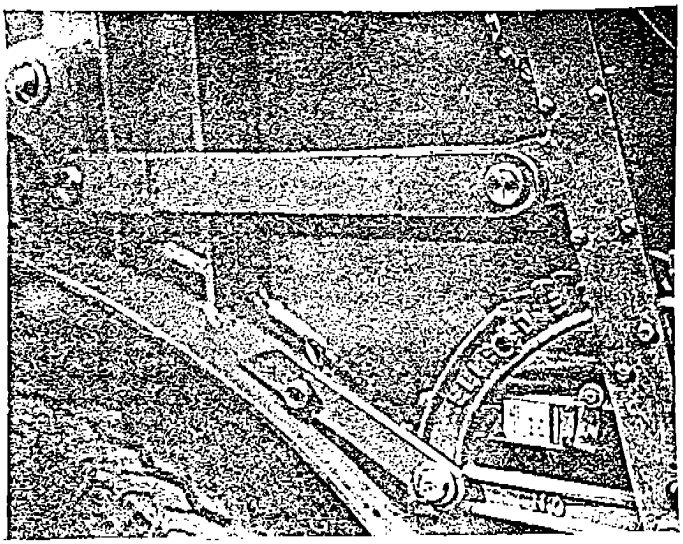


Picture No. 66

be parallel so that the seat will hang straight. This will minimize wear on the seat pin. If you find that the crossbars are not parallel to the main axle, this can be adjusted with the cross cables that form an "X" across the Wheel, just above the seat, at the point where the drive rims connect (Picture #64). These are the shorter of the two lengths of cable used to true the Wheel. If adjustments must be made, it is advisable to open all of the turnbuckles except for a pair of cables on each side of the Wheel; directly across from each other. This means that there are four cables being used at this time. After you have paralleled the two sides of the Wheel, the long spoke cables should be adjusted until the spokes are the same distance from each tower. If you close all of the cross cable turnbuckles before adjusting the long spoke cables, you may find that there will be a great deal of resistance because of these cross cables.

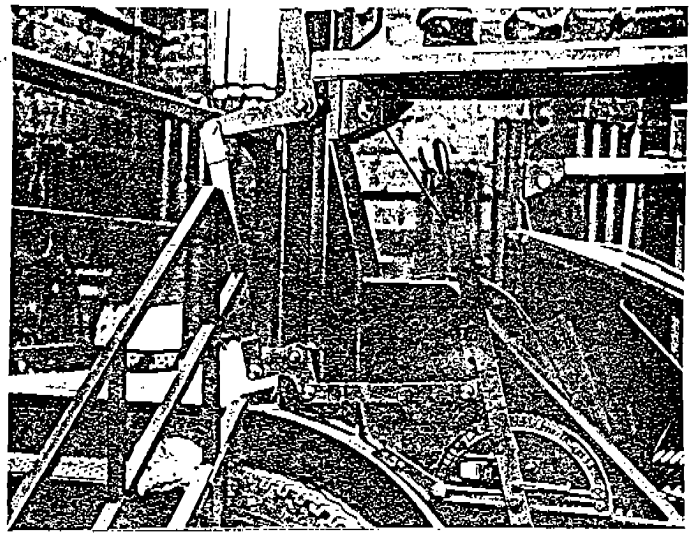
The spokes can be pulled easily to one side or the other by loosening one spoke cable turnbuckle and tightening the other one. It may be necessary to go around more than once in order to complete the adjustments needed. When the spokes appear to be running true, you can snug up the turnbuckles on the cross cables. All cables within the Wheel should be tightened about the same, so that all will carry their share of the load. If you notice slack or flopping in the cables when starting or stopping, check them to be certain they are properly tightened. If they are not tight enough, the turnbuckles sometimes open on their own and occasionally they will open when the Wheel is folded, because of vibration on the highway. When a turnbuckle is thrown over into the overcenter locked position, you should feel it going over center firmly, although you should never have to "lean" on a turnbuckle to get it closed. It is not necessary that the cables be "fiddle string tight" in order to work properly, but they do have to be tight enough so that they will hold their adjustments.

The clearances between the drive rims and the towers are quite close, so it is very important that the Wheel be running true.

36. Next install the reversing linkage so that the rubber tire drive can be run in both directions and the brakes can be released. First, unpin the bar stop (Picture #65), which limits the travel of the brake ratchet handle, and rotate it toward the rear (Picture #66). Then slip the linkage assembly onto the two pins sticking out of the right side of the right vertical post next to the loading platform (Picture #67). One of the bars of the linkage slips onto the vertical bar of the brake ratchet handle and is then pinned to it. The plunger which engages the teeth of the brake ratchet musted be lifted and held there. This is done by inserting a hairpin cotter through the plunger on the back side.

37. At the front of the trailer, there is a rectangular plate pivoted on the top flange of the beam on the right side. This plate carries the stop which prevents the Wheel from being operated backwards while carrying passengers. Remove the pin holding it, turn the plate counterclockwise until the second hole is in line (Picture #68) and then replace the pin.

38. At this point, you will not be able to complete the assembly of the HY-5 II until you have electrical power available for the two electric motors. With power connected, start the two electric motors. The brake ratchet



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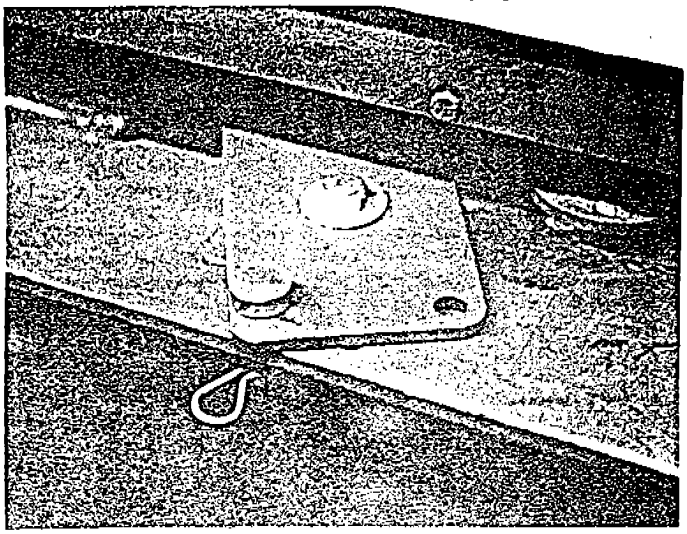

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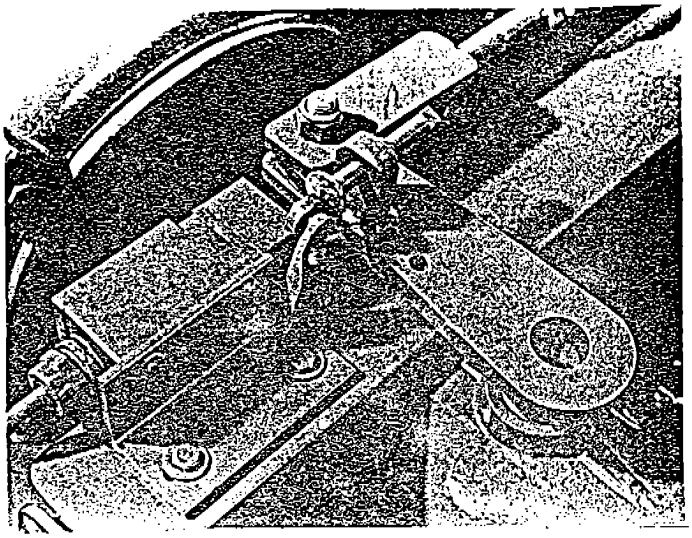

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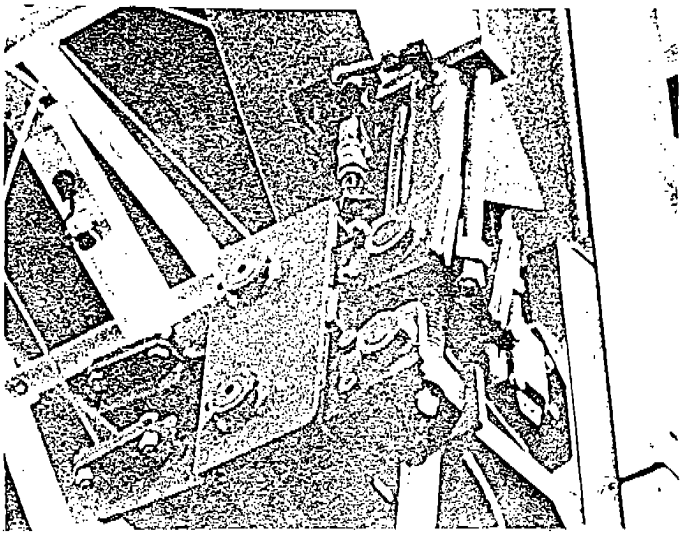

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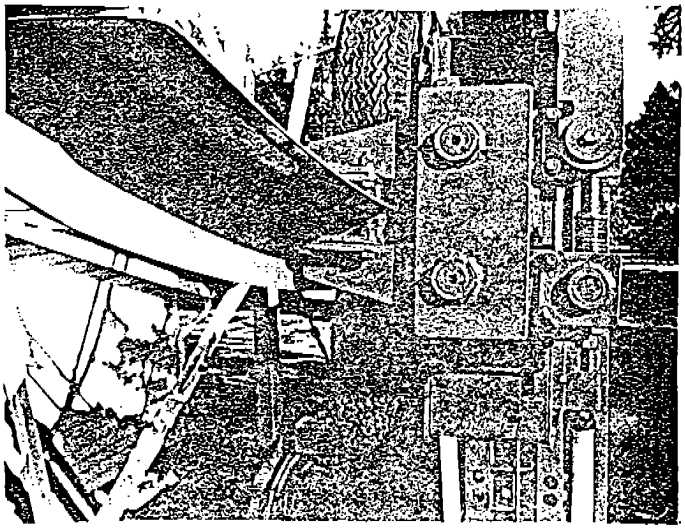

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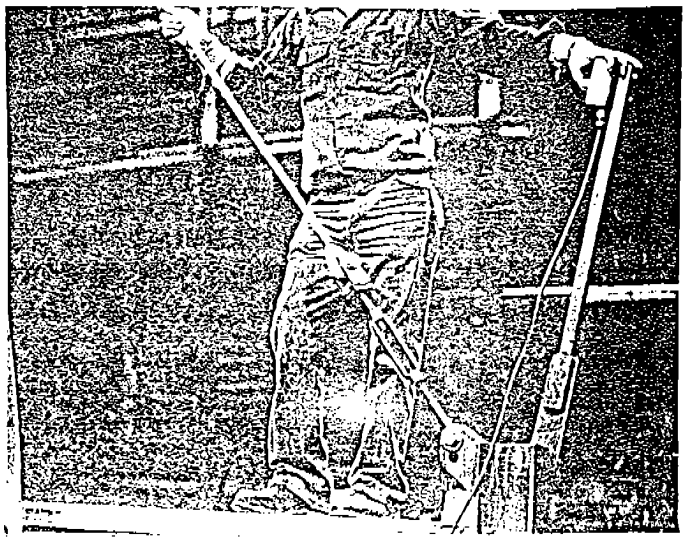


Picture No. 72

handle must be toward the rear in the "neutral" position for them to start. There is a microswitch on the linkage above the motors that must be engaged or the motors cannot be started (Picture #69). The start/stop is located to the far right of the loading platform and the magnetic starter is under the floor, to the left of the loading platform. MOTORS ROTATE CLOCKWISE! ¶

With the motors running, the auxiliary pump on the front end of the right variable displacement pump, mounted on the right electric motor, provides power for operating the brakes, which clamp the drive rims (Pic. #70 & 71). It takes a short interval for pressure to build up in the accumulators and until that happens, the brakes cannot be operated. When the equipment is all shut down, various codes require that the pressure be bled off of the accumulators, so there is always a short startup period.

The long control handle on the right side, above the work platform, is moved backwards and forwards to control the direction of the rubber tire drive, and the pushbutton releases the brakes (Picture #72). The drive rims cannot pass through the tires without first opening up the brake shoes. Moving the reversing linkage toward the rear of the trailer, will cause the rubber tire drive to turn in the normal direction when carrying passengers. Pushing the handle toward the front of the trailer will reverse the direction of the tires.

39. The drive rim assembly can begin at any drive rim location (Picture #73). While standing on the work platform, remove the Klik pin locking the drive rim to the outer end on the seat pin (Picture #74), flex the drive rim outward until it will clear the end of the seat pin, then swing it up into operating position; with the guide hook on the swinging drive rim (Pic #75) going in behind the pivoting end of the next drive rim. Pin it in place and lock the pin with a Klik pin (Picture #76). The head of the pin should toward the outside. Rotate the Wheel until this first drive rim you have installed, on each side of the Wheel, is forward of the front sides of the towers, so that the rubber tire drive can be positioned.

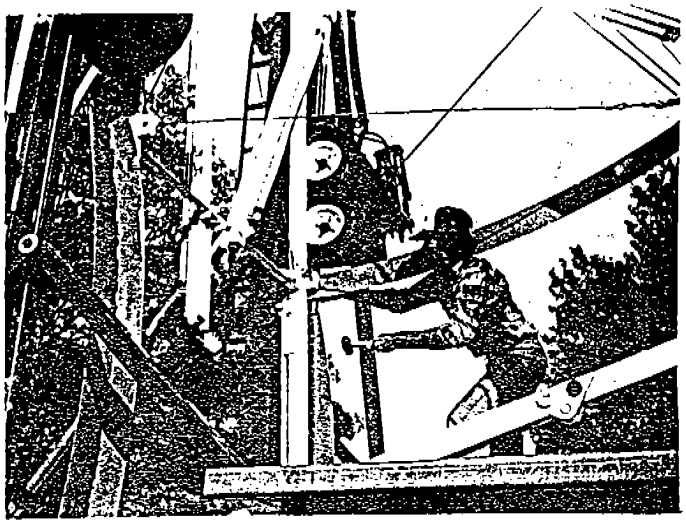
40. Lower the rubber tire drives to operating position. Tighten the small winch (Picture #77) mounted on the rear side of the tower, until the pin under each drive can be removed (Picture #78). Then back off on the winch and the drive will roll down the track to its operating position (Picture #79). At this point, the entire drive is in its bottom position and is resting on springs inside the track. WARNING: WHEN LOWERING THE DRIVE, HANG ON TO THE WINCH HANDLE. IF IT GETS AWAY FROM YOU, THE HANDLE CAN SWING AROUND RAPIDLY AND STRIKE YOU ON THE BACK OF THE HAND, POSSIBLY EVEN HARD ENOUGH TO BREAK A BONE. HANG ON TO THAT HANDLE!!

    The winch handle should always be left in a position where it does not stick out between the towers, because the folded drive rims could catch on it (Picture #77).

41. The hinged hose cover above the drive straightens out when the drive is lowered, but it may not have come all the way against the tower. Push in at the hinge location and lock it with the thumb pins that are hanging nearby.

42. Push the brake release button and push the long control handle toward the

¶ IF THEY DO NOT TURN CLOCKWISE (SEE RED ARROW ON TOP OF PUMP FRAME), YOU WILL DAMAGE THE HYDRAULIC PUMPS VERY RAPIDLY. IT IS IMPORTANT THAT YOU CHECK THIS EVERY TIME YOU HOOK UP POWER TO THE RIDE.



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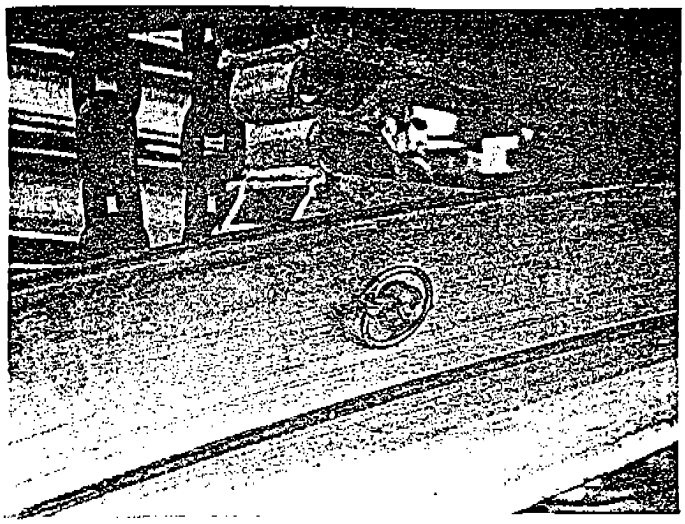

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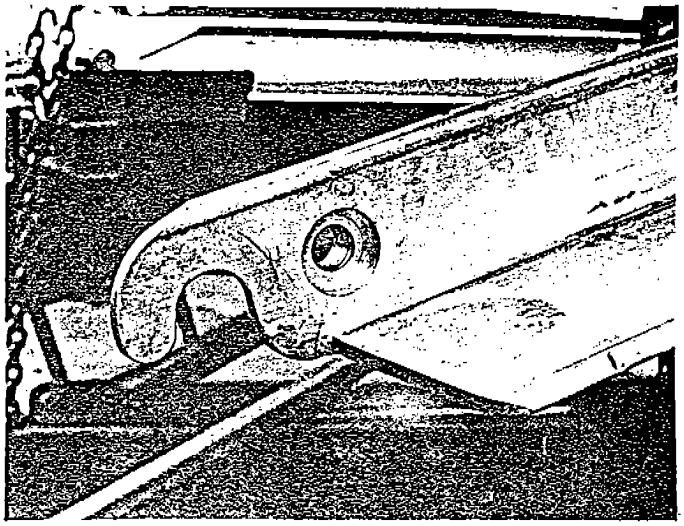

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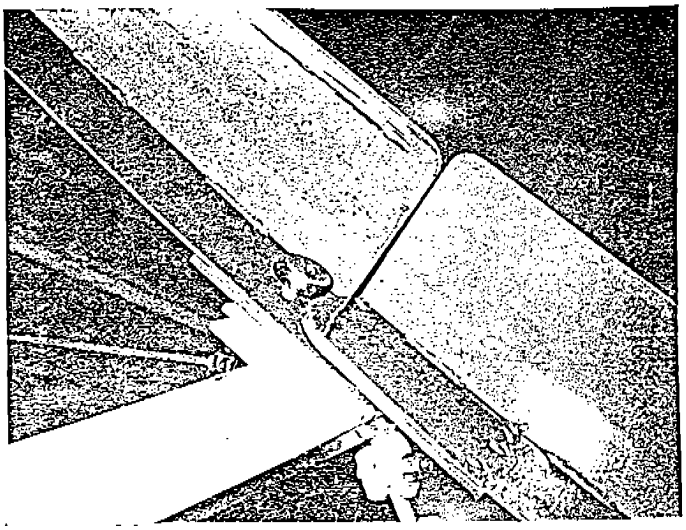

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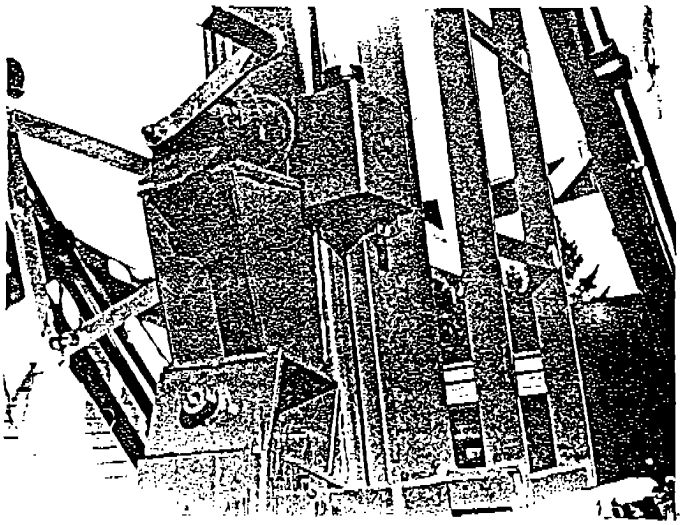

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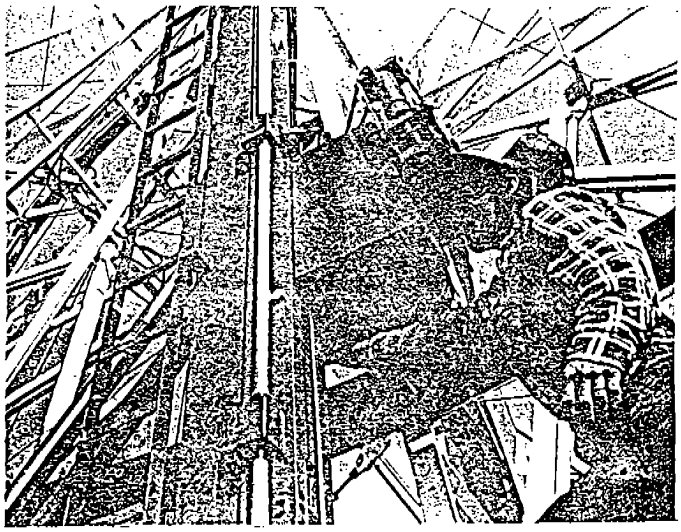


Picture No. 78

front of the trailer. The rubber tires will then begin to turn the Wheel backwards. Feed the first drive rims between the tires and open the brake shoes. From here on, turn the Wheel in the opposite direction; with the long control handle pushed toward the rear of the trailer. To repeat, after you have installed the first drive rim on each side, swing them forward out of the way, drop the rubber tire drives into position, drive them backwards and feed the first drive rims back through the tires and open the brake shoes. IF YOU DO NOT FOLLOW THIS PROCEDURE, YOU WILL NOT BE ABLE TO INSTALL THE RUBBER TIRE DRIVES. Once you have the rubber tire drives gripping the first drive rim on each side, you can turn the Wheel in the forward direction to install the remaining 11 drive rims on each side. (Picture #80 and 81)

43. After all of the drive rims have been installed, put the remaining eight seats on (Picture #82 and 83). They are to go in numerical order so that as the seats drop down toward the loading platform, they will be consecutively numbered. It is recommended that the seats in the seat racks be stored with the #1 seat in the rear and the #11 seat in the front, in that order. Then, when you are hanging the seats on the Wheel, you stand with the #1 seat between you and the front of the trailer. With the proper spoke directly above that seat, lift the seat off the rack and hang it on the Wheel. Then turn the Wheel in the forward direction so that the next spoke is directly above the #2 seat, and so on until all of the seats are hung on the Wheel. By doing it in this way, you will not have to be getting out of the way of seats already on the Wheel when turning to the next position, except for the four seats that remain on the Wheel all of the time.

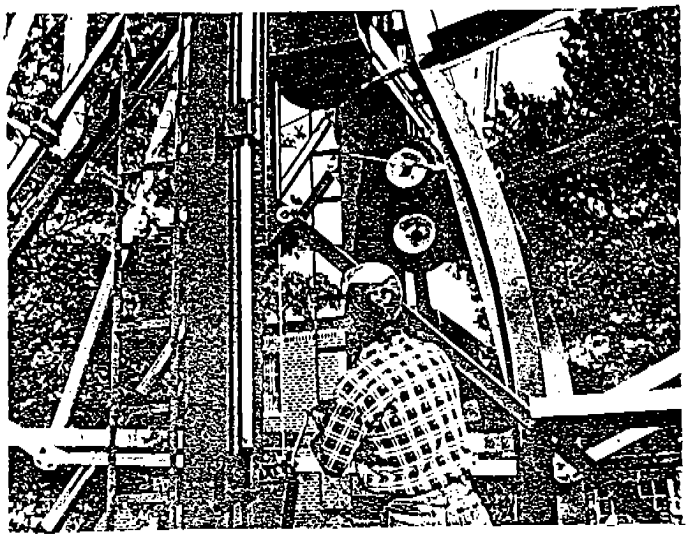
As soon as each seat is hung on the Wheel, insert a seat lock in each end. (Picture #84) The seat lock must be shoved up against the seat pin inside the seat hanger casting, and it must snap down behind a crossbar in the casting or it will not be locked in place. When installed, the seat lock should be firmly held in place by the spring and you should not be able to rattle it. If it can be rattled, then it is not locking properly and it should be replaced. This is very important because it is the safety device that will keep the seat from coming off the seat pin, if for any reason the seat is turned upside down.

Make sure that the seat pin on each end of each seat is properly positioned in the seat hanger castings. In one case, a seat pin was hooked on a hair-guard bracket instead of a seat hanger casting, and the operator inserted the seat lock in the seat hanger casting without even looking to see that the pin was NOT EVEN IN THE CASTING. This caused a very serious accident that could have been avoided completely if the operator had taken the time to look at the end of the seat.

Remove all seat covers from the seats and store them away. Operators will often put them under the gooseneck and on the ground.

44. Install the hairguards by first fitting the curved part over the front of the seat, then pulling the part that goes across the back of the seat in place. The hairguards are secured in place with quarter-turn fasteners. Be sure that all are securely fastened.

Fold down and lock the footbottoms on the seats.



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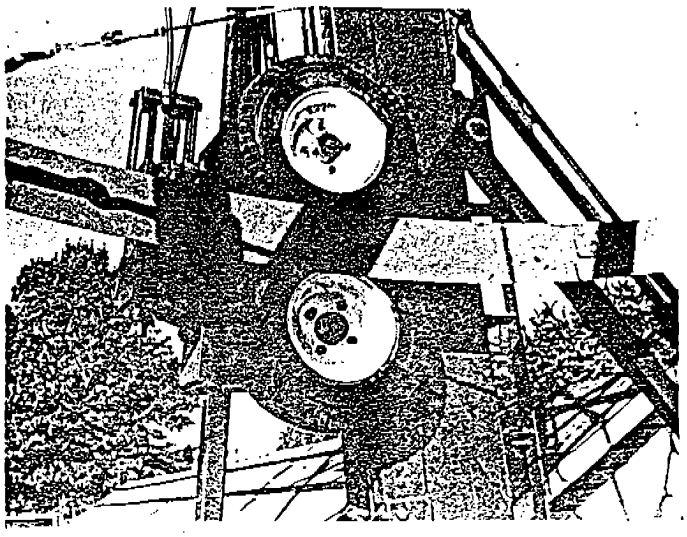

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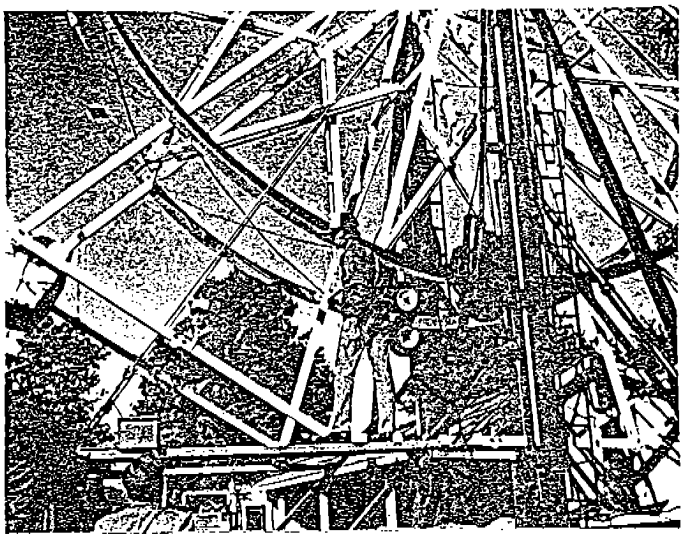

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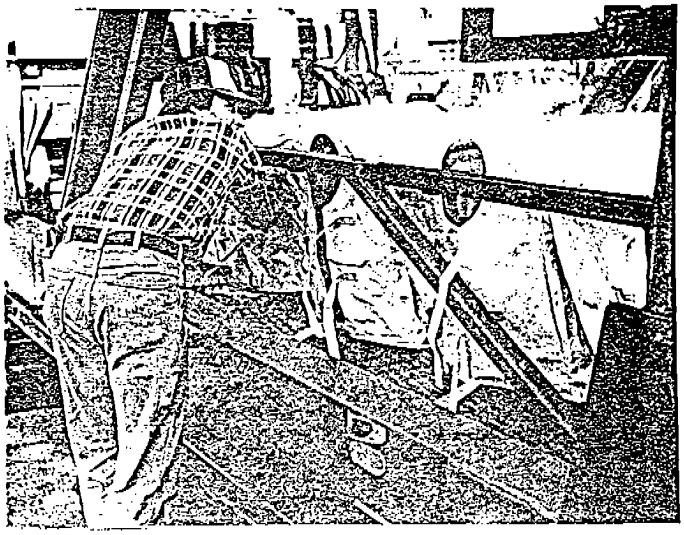

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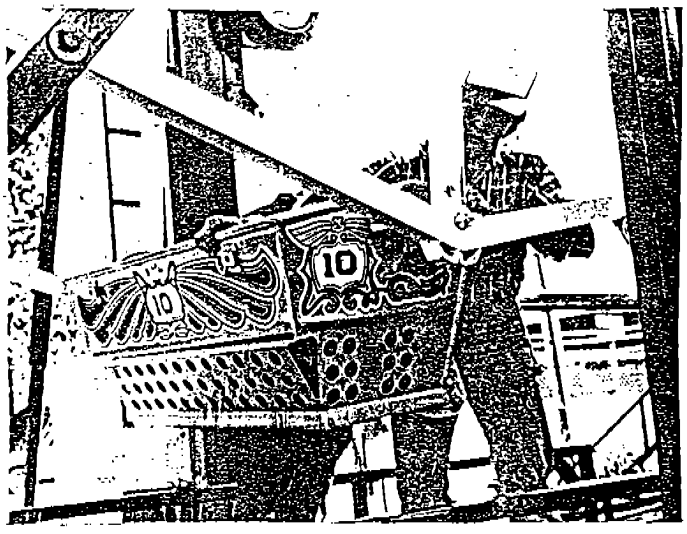

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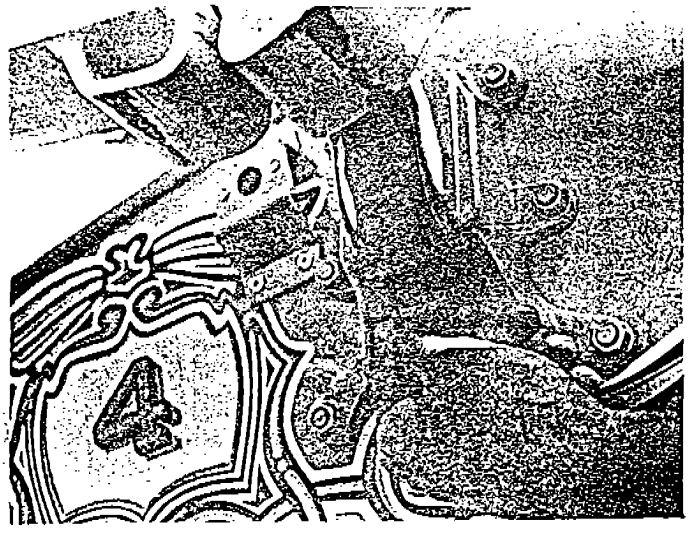


Picture No. 84

45. Remove the two rear seat racks and store them under the trailer.

46. Remove the reversing linkage, disconnect the brake pushbutton, remove the winch up/down control, and store all of them in the rear storage box. Remove the two work platforms and store in the bed of the trailer beside the front seat racks. Replace the bar stop on the brake ratchet assembly, pin and lock it in place. Remove the hairpin cotter from the plunger on the brake ratchet handle. On the front end of the trailer, on the right side, move the rectangular stop plate clockwise until the other hole lines up (Picture #85), then reinsert the pin, which should then be locked in place.

47. Move the brake ratchet handle forward and turn the Wheel slowly. Check to see that all is clear as the Wheel turns. Then bring it up to top speed and let it run there for a few revolutions. At this time, examine how the tires are tracking on the drive rims. If you see that there is less clearance on one side of the Wheel, adjust the screws at the bottoms of the windbraces to even out the clearances. This may move the Wheel closer to one tower than the other, but it is most important that the tires track evenly, so that they neither run off the drive rims nor rub against the vertical legs of the drive rim angles.

48. Finally, underneath each rubber tire drive box, there is a bar with two adjusting bolts in it (Picture #86). Turn the bolts down against the track until they are snug, then tighten the jam nuts so that the bolts will not loosen. Clearances had to be built into the rollers and track, but if the clearances are reduced to as near nothing as possible, the drive will run straighter than if the adjusting bolts are not used to take the slack out. Some irregularities in the curvature of the drive rim may cause the drive boxes to move up and down slightly. If the adjusting bolts are just snug, but not tight, then the drive boxes will be able to move up and down with the drive rims.

This completes the assembly of the HY-5 II and it is ready to carry passengers.

HY-5 II DISASSEMBLY PROCEDURE

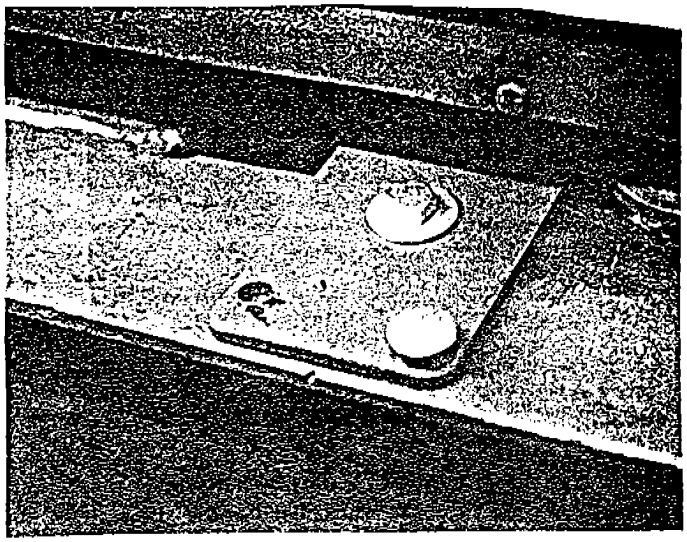
Disassembling the HY-5 II is essentially the reverse of what was done when it was assembled, with a few significant differences. In the following steps, where the same procedure is used both in setup and teardown, it will be very briefly covered. Where something different will need to be done, it will be fully explained.

1. Loosen the bolts under each rubber tire drive box and reset the jam nuts so the bolts and nuts cannot fall off on the highway.

2. Take the hairguards off and store them in each seat. Fold the footbottoms up and lock them in place. Put all of the seat covers on and tighten the straps on them.

3. Install the work platforms.

4. Install the reversing linkage and do not forget to move the rectangular



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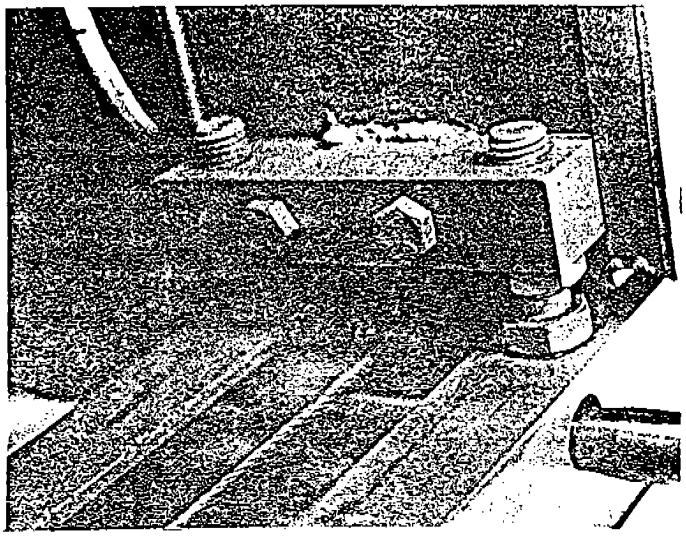

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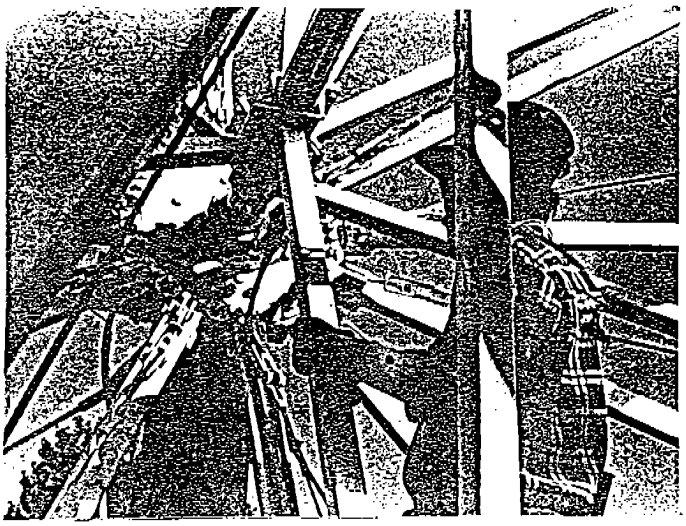

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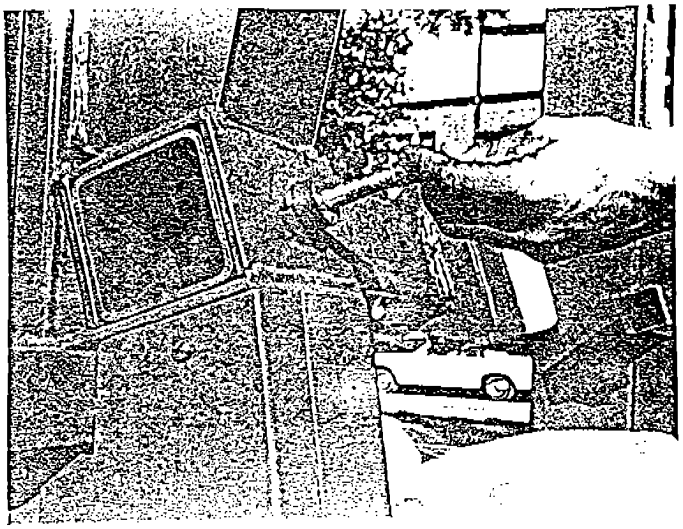

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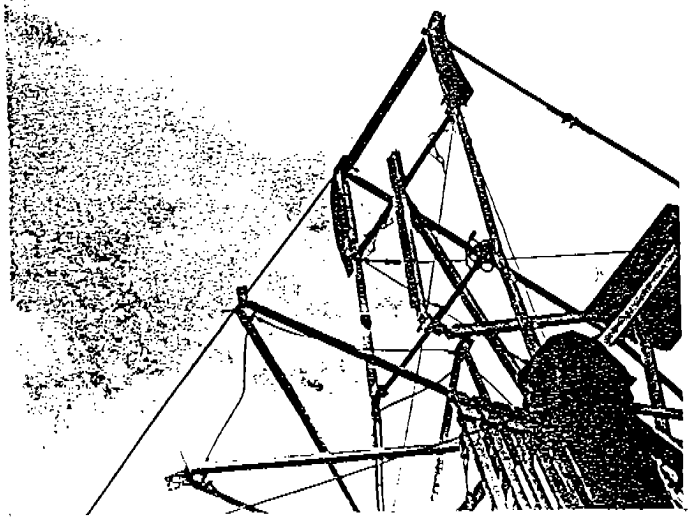

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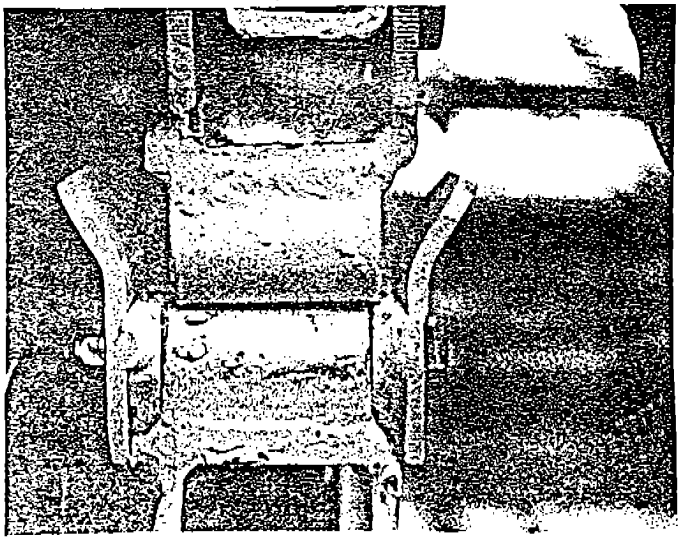


Picture No. 90

stop out of the way on the right front end.

5. Run the Wheel forward as you remove seats 1, 2, 4, 5, 7, 8, 10 and 11. Stand in the floor of the trailer facing toward the rear. Let the Wheel turn forward until seat #1 is above the seat rack position furthest to the rear. Lift off the #1 seat and place it on the rack. Step to the next rack position, turn the Wheel until #2 seat is above it and lift off that seat. Bypass the #3 seat because it stays on the Wheel. Put #4 seat on the third rack position, and so on until #11 seat is stored on the seat rack nearest the front of the trailer. If you follow this procedure, you will only have to get out of the way for seats 3, 6, 9 and 12. With practice, you may find a different or easier way to remove the seats; as it may suit your individual preference.

6. Turn the Wheel backwards as you fold up all of the drive rims. When you come to the last drive rim on each side, run the rubber tires off the drive rims and fold the drive rims.

7. Remove the thumb pins holding the hose covers against the towers and raise the rubber tire drives to their storage positions. Lock them in place. You may find that you will have to pull the hose covers away from the towers to get them started moving.

8. Remove the single hub pin from each hub assembly. It will be necessary to turn the Wheel until the pin is in the clear, before it can be driven out. (Picture #87)

9. Disconnect the electrical jumpers and wind them around the spoke crossbar.

10. Disconnect the two light panels crossing over from the master spoke to the last spoke and move them into their storage positions.

    NOTE: DO NOT STOW THE LIGHT PANELS UNTIL ALL PASSENGERS ARE OFF THE WHEEL AND THE FOOTBOTTOMS ARE FOLDED UP. OTHERWISE, A FOOTBOTTOM MAY CATCH ON THE LIGHT PANEL AND TURN UPSIDE DOWN AS THE WHEEL TURNS.

11. Hang the singletree on the master spoke. Start the engine, unwind the winch cable and connect it to the singletree.

12. Disconnect the two cross cables at the master spoke and store them with the thumb pins provided.

13. Separate the rim sections at the master spoke, swing each half up against the spoke and pin it in place.

14. Install the spoke rest in each tower and fasten with a thumb pin (Pic. #88)

15. Connect the spoke pullback cables to the seat pins of the last spoke and to the rear end. Be sure that the last spoke is clear of the spoke rests.

16. Remove the first rim pins to the rear of the towers; two from each side.

17. Getting the Wheel to start to fold requires a little effort, because at this point, it is essentially balanced and does not exert a load on the

winch cable. Push up on the rims where the pins have been removed. Have some slack in the winch cable and rotate the Wheel by hand so that the singletree comes down toward the towers. Then swing the Wheel rapidly in the other direction. With the last spoke restrained by the spoke pullback cables, the rest of the Wheel turning will cause the rims to fold. If it doesn't happen the first time, try swinging the Wheel a little more rapidly and it will begin to fold. As soon as there is some tension on the winch cable, the rest of the Wheel will fold down easily.

There should be no problem with cables or electrical jumpers getting hooked on anything, but you should still watch them as the Wheel is folded.

18. When the spoke carrying #6 seat passes by, you will see a cast aluminum plate fastened to the inside of each spoke tube. The plate says, "WINCH CABLE MUST ENGAGE DERRICK NOW". At this point, the winch cable is ready to feed onto the point of the derrick, or A-frame (Picture #89). The cable must go between the ears of the A-frame, or the cable will slip down the side of the A-frame and all leverage will be lost. The Wheel will be out of control and swing down at a very rapid rate. It would be very dangerous for anyone to be in the way if this should happen. On the original HY-5 models, this happened more than once, so it is extremely important that you check to be sure the winch cable is feeding on properly. DO NOT ATTEMPT FOLD THE WHEEL ANY FURTHER IF THE WINCH CABLE WILL NOT ENGAGE THE A-FRAME PROPERLY.

    This loss of leverage has never happened where we were able to observe it, although we know by reports from HY-5 owners that it has happened more than once. We believe that it occurs because of a shift in the trailer level, or possibly a change in the tension of the corner guy cables. It is our belief that if you find it appears that the cable will miss the A-frame, you can probably get it back in line by adjusting the screws on the wind-brace feet. If this will not bring the winch cable back in line with the A-frame, tightening corner guy cables on diagonally opposite corners and loosening the other two, will move one tower ahead of the other. This will swing the A-frame around.

19. As a seat comes by the loading platform, rotate it into the storage position and secure it with the seat restraint. Do this before you fold the rims that hold the seat away from the spoke stack. Each seat must be hooked up just before reaching its folded position. Otherwise, the seat pins on the next spoke will dig into the sides of the seat.

    Be sure to do this seat hookup while standing on the loading platform; with the seat between you and the front of the trailer.

20. The folded rims will tend to seat down on each other. There are ears to help guide them into position (Picture #90). Occasionally, they will not be properly seated and this will have to be corrected before the towers are folded down.

21. When the master spoke has been folded down against the spoke stack, the turnbuckles of the spoke pullback cables can be loosened, allowing the spoke stack to move back onto the spoke rests. Be sure that they do come to rest on the rubber pads of the spoke rests. Sometimes the spoke stack may

hang to one side and will not be in line with the spoke rests. Shove them over until they are in line with the spoke rests. Then the spoke pullback cables can be removed.

22. The sway brace cables used to cross brace the spoke stack when on the highway, are to be installed now, but in a different location. The cable is to be connected at the end of the singletree as before, but the shackle in the middle of the cable is to be connected to the plate under the rear edge of the spoke rest (Picture #91). The purpose of this cable is to connect the winch cable to the singletree, and through these sway brace cables, to the spoke rests.

23. Remove the work platforms and store them beside the seat racks on the pins provided.

24. Unpin and stow both windbraces. Be sure both of these are pinned in place and that each pin is locked with a Klik pin. If they are not securely locked, it is possible for them to swing out on a highway curve; at great hazard to oncoming vehicles, besides damaging the equipment. THIS HAS HAPPENED; DON'T LET IT HAPPEN TO YOU.

    Stow the windbrace crossbars by swinging them forward and pinning each one in place. Lock each pin with a Klik pin. These pieces could also swing out into the path of traffic; if not properly locked. Store the windbrace feet in the front storage boxes in the trailer.

25. Remove a tower hinge pin from each tower.

26. Remove the center pins from the front kneebraces.

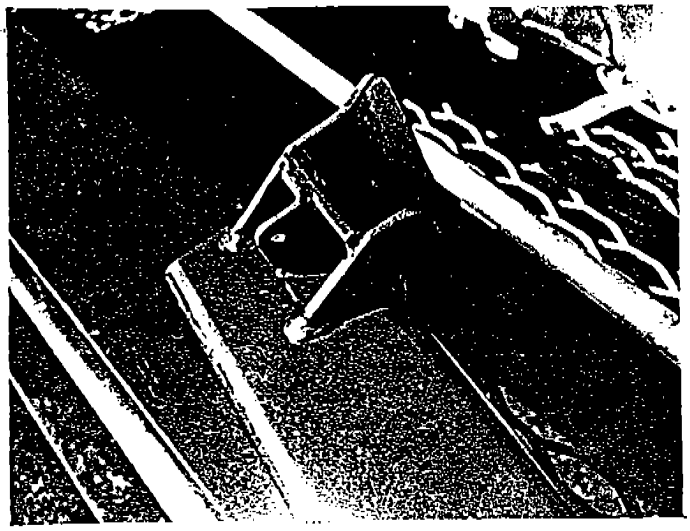
27. Remove the pins connecting the rear kneebraces to the trailer frame.

28. Disconnect the rear corner guy cables and connect each one to the end of the rear kneebrace. Lock each pin with a Klik pin.

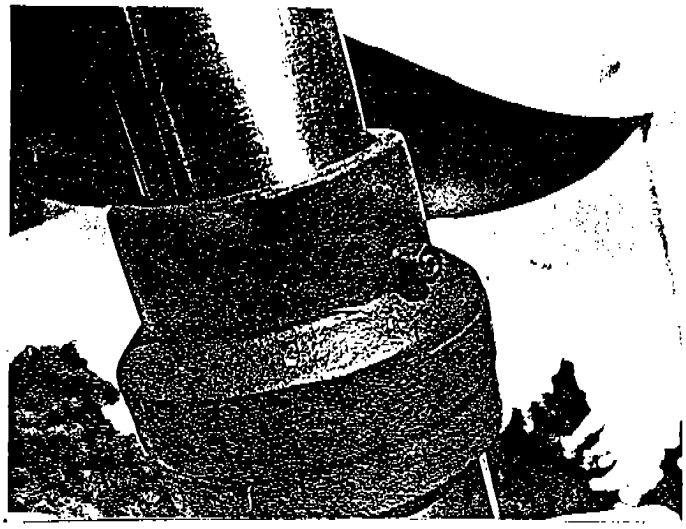
29. Position the up/down switch on the right front seat rack.

30. With gasoline engine running, raise the two valve handles on the right side and you will see the two cylinders stiffen as pressure is applied. There is a bleed port at the top of each cylinder (Picture #92). Open this port and make sure that there is no air trapped in the top of the cylinder. Raising the valve handle will force the air out; when oil comes out, you will know that the air has been bled off and you can close the port. It is important that you do this each time you are ready to lower the towers, because if air is trapped in the cylinder when the load comes on the cylinder, the air will compress and the tower will drop farther than it should. This could damage the equipment, so check for air in the cylinders at this time.

31. If you push down on the two handles, nothing will happen because the weight of the towers is not over center. You have to use the winch to get the towers over center. Push the "UP" button and the winch cable will tighten. THE TWO VALVE HANDLES MUST BE PUSHED ALL THE WAY DOWN WHEN YOU DO THIS, OR YOU WILL DAMAGE THE STRUCTURE. The winch cable goes over the top of



Picture No. 91



Picture No. 92

the A-frame and through the sway brace cables, is connected to the spoke rests. In this way, the winch cable will pull the towers over. When the weight has gone over center, the winch will no longer be needed; the towers will continue to descend as long as the two valve handles are pushed down. The engine can be shut off because it is no longer needed at this time. Be sure that the front corner guy cables are between the tower posts.

32. Fold the A-frame and secure it with the winch cable. The A-frame is held together with six cables, but only two of them are to be disconnected. They have quick-release thumb pins on one end only. Disconnect the two cable ends and replace the thumb pins in the clevises. Fold the A-frame so it is horizontal. When stacked right, there will be two loops of cable hanging down at the front.

    Wrap the short cable around the main axle and over the winch cable above the axle. Pull the winch cable back underneath from the front end of the A-frame and include it within the short cable loop. Secure the short cable loop with a clevis and thumb pin. Tighten the winch cable until it fits snugly across the top and under the A-frame. Be sure that the cable lying across the folded spokes is not on top of a light panel, but off to one side. However, do not draw the cable "fiddle string" tight or you will kink the cable. It will be necessary to start the engine to put tension on this cable.

    Next, connect the loops of cable hanging down at the front of the A-frame to the short cable loop, using a rubber tarp strap with hooks on each end.

    Finally, swing the A-frame prop pole up to a vertical position. Insert the finger on the upper end of the pole into the hole on the bottom side of the rear end of the A-frame, and pull the A-frame down firmly against the top of the prop pole. Connect the loose cable coming down from the top of the A-frame to the tab connection part way down the prop pole.

    It is very important that the A-frame be stowed away properly. Traveling on the highway, low hanging tree branches will occasionally hit the highest parts of the ride. There have been occasions where the A-frame not properly locked, has hit some branches and the A-frame has been pulled to a vertical position. The driver is not likely to see such a thing occur, and if he were to drive under an overpass, there is a strong chance that the A-frame and other equipment would be damaged.

33. Store the up/down switch in the rear storage box.

34. Fold up the stairs and secure them with the tie bar across the top.

35. Crank up the rear landing gear.

36. Raise the front of the trailer far enough that the tractor can back under. Lock the fifth wheel of the tractor to the kingpin of the trailer. Connect the air and electrical lines at the front of the trailer.

37. Retract the front landing gear all the way.

38. Store the wooden pads on the floor of the rear end and secure them with tarp straps hooked into the expanded metal flooring.

39. Disconnect to power cable and put it on the front floor.

40. Unpin the operator's seat, swing it around to storage position and pin it in place.

41. Disconnect the sway brace cables from the spoke rests, stretch each one to the far side of the trailer and pin the tube connection into the rear kneebrace pin connection, on top of the trailer main beam. Tighten the turnbuckles so that the top of the spoke stack is held firmly, then tighten the jam nuts to keep the turnbuckles from unwinding while traveling on the highway. Unless these sway brace cables are used, the entire spoke stack will sway considerably back and forth. These cables will greatly reduce the tendency of the stack to sway.

42. Before driving off with your HY-5 II, go around the trailer and inspect every connection; to be certain that every piece is properly tied down or pinned, and that every pin is locked. This will take very few minutes, but could prevent a serious accident or damage to your equipment.

This completes the disassembly of the HY-5 II BIG ELI WHEEL.

After you have familiarized yourself with the complete assembly and disassembly procedures, you may find the following check lists helpful; which very briefly cover each step of these procedures.

ASSEMBLY CHECK LIST

1. Position landing gear wooden pads.
2. Pull out and connect power cable.
3. Start gasoline engine and lower front landing gear.
4. Disconnect tractor.
5. Level trailer.
6. Open up stairways.
7. Position operator seat.
8. Remove sway brace cables.
9. Open A-frame.
10. Cock tower shock absorbers.
11. Unwind winch cable.
12. Raise towers.
13. Connect rear corner guy cables.

14. Pin kneebraces.

15. Install tower hinge pins.

16. Position windbrace feet and crossbars.

17. Pin windbraces to feet.

18. Install work platform.

19. Connect spoke pullback cables.

20. Open Wheel, pin rims and remove seat restraints as you come to them.

21. Connect final rims and cross cables.

22. Remove spoke pullback cables.

23. Remove singletree and wind up winch cable.

24. Install hub pins.

25. Position two light panels and electrical jumpers.

26. True Wheel.

27. Install reversing linkage and turn rectangular stop plate on front of trailer.

28. Start electric motors. CHECK ROTATION OF THE MOTORS.

29. Install first drive rim on each side, swing them forward of the towers and lower the rubber tire drives into position. Pin hose covers.

30. Reverse drive and feed rubber tire drives onto drive rims.

31. Drive forward and install remaining drive rims.

32. Hang seats and install seat locks. Remove seat covers. Open footbottoms. Install hairguards.

33. Remove rear seat racks.

34. Remove reversing linkage, disconnect brake pushbutton, remove winch control Remove work platforms. Move rectangular stop plate on front of trailer so it has an active stop.

35. Tighten rubber tire drive to tracks.

DISASSEMBLY CHECK LIST

1. Loosen rubber tire drive on tracks.

2. Remove hairguards, fold footbottoms and put seat covers on.

3. Install work platforms.

4. Install reversing linkage. Move rectangular stop plate on front end so it does not act as a stop.

5. Remove seats 1, 2, 4, 5, 7, 8, 10, and 11.

6. Fold drive rims as Wheel is driven backwards.

7. Unpin hose covers and raise rubber tire drives. Lock them in place.

8. Remove hub pins.

9. Disconnect electrical jumpers. Stow away two light panels.

10. Hang singletree. Start engine and unwind winch cable.

11. Disconnect cross cables and two "broken" rims.

12. Install spoke pullback cables.

13. Begin folding Wheel. As #6 seat passes operator, check that winch cable engages A-frame.

14. Leave seats 3, 6, 9 and 12 on the Wheel, which are to hooked up with seat restraints.

15. Remove spoke pullback cables.

16. Install sway brace cables from singletree to each spoke rest directly below

17. Remove work platforms.

18. Disconnect windbraces, crossbars and feet.

19. Remove tower hinge pins.

20. Unpin kneebraces.

21. Disconnect rear corner guy cables and connect to rear kneebraces.

22. Start gasoline engine. Install up/down switch. Use winch to pull towers over; with valves open to large cylinders.

23. Disconnect A-frame, fold flat and lock in place. Secure winch cable.

24. Store up/down switch.

25. Fold stairs and lock in place.

26. Retract rear landing gear.

27. Connect tractor and hook up air & electric. Retract front landing gear.

28. Store landing gear pads on trailer floor.

29. Disconnect and store power cable.

30. Store operator's seat.

31. Disconnect bottom end of sway braces and connect to opposite side for cross-bracing spoke stack.

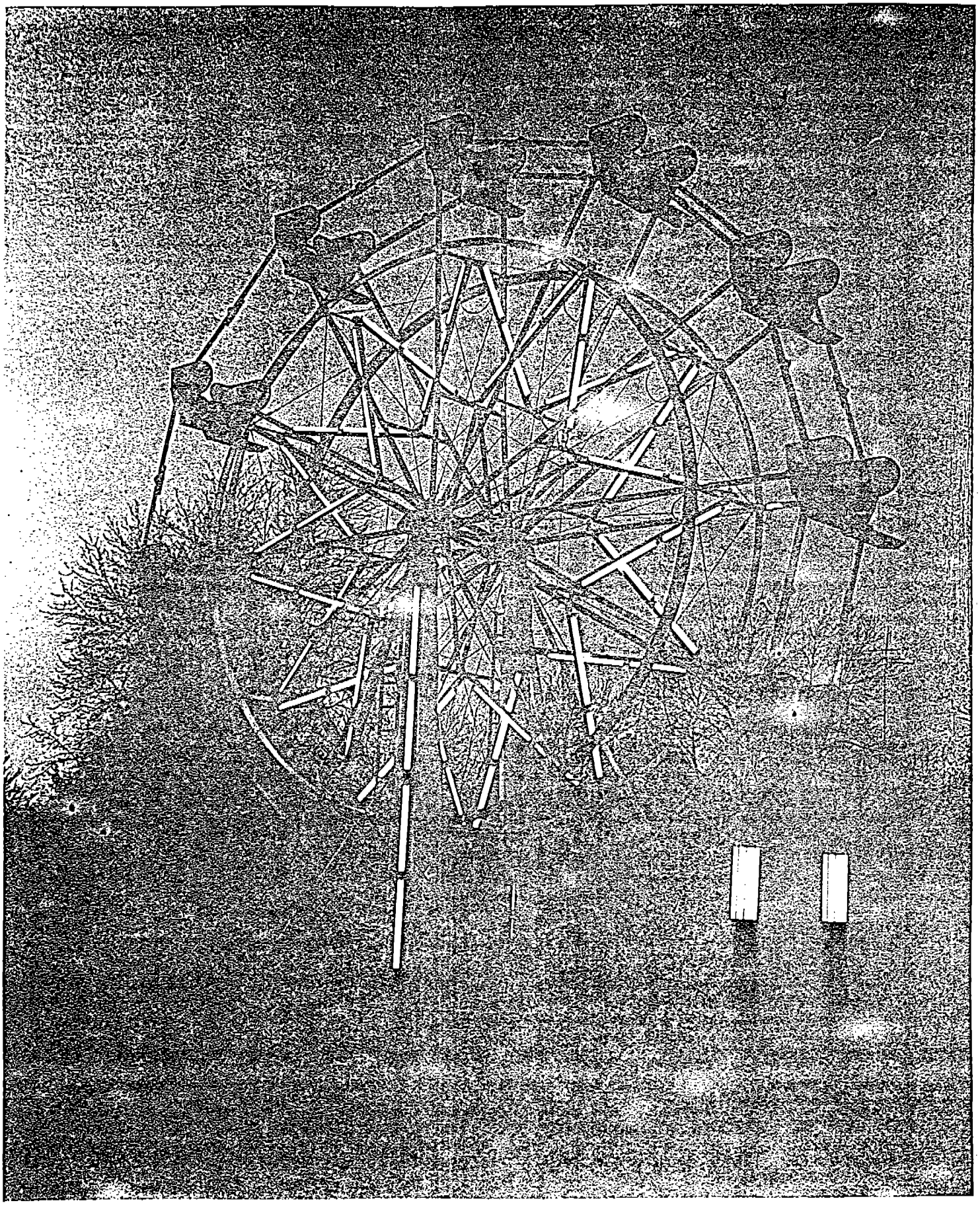
LIGHTING AND WIRING

Standard lighting on the HY-5 II (Picture #93) includes two six-point stars, with a total of 24 light panels, each of which has one 30 watt and one 40 watt rapid start fluorescent lamp. The stars fold with the Wheel and only two of the panels need to be repositioned for folding. There is a row of slimline fluorescent lamps on each tower (Picture #94). Each row has four 40 watt lamps for a total of eight lamps. These lamps stay in place at all times. At the rear of the trailer, there is a cluster light on each side, which has six 36T12 slimline fluorescent lamps (Picture #95).

All of the lamps on the HY-5 II are enclosed in gold colored flexible plastic sleeves, which are standard. These sleeves have several purposes. Most importantly, they help protect the passengers from falling glass, if a lamp should break. The plastic sleeves will not break and their purpose is to help contain the glass of a broken lamp. Secondly, they insulate the lamps so that they will light and stay lit better at colder temperatures than unprotected lamps. Thirdly, they help protect the lamps from flying rocks on the highway. Fourth, white lamps are readily available almost anywhere and with colored sleeves you have colored lights without the difficulty of obtaining special colored lamps. And lastly, the gold color was selected to minimize the attraction of flying insects.

All HY-5 II light fixtures are designed to use 110 volt, 60 cycle power. A "3-wire" system is used which provides a hot line (black), a neutral (white) and a third conductor (green) for grounding to the ride structure. The sockets in the light panels are individually grounded to the frame, and the jumpers carry the two power lines and the ground to the collector rings. A rubber-covered 12/3 cable connects from the collector ring fingers to the breaker box located beneath the loading platform. The black conductor is connected to a breaker, the white conductor to the neutral bar and the green conductor is bolted to the ride frame. The breaker box is a Series A-1 Rainproof 125 A. Load Center. A rubber-covered 10/4 cable connects the load center to a 30 A. fused disconnect box located on the same surface near the opposite edge of the loading platform. Another rubber-covered 10/4 cable connects from the fused disconnect to the main entrance box, located on the outside of the left main trailer beam.

The main drop is rubber-covered 2/4 cable and connects in the main entrance box to L-1, L-2, L-3 and Neutral, located in the box, on the left hand side. BE SURE YOUR NEUTRAL IS CONNECTED TO THE TOP TERMINAL MARKED "NEUTRAL". If your incoming power is "wye" connected having three 125 volt lines, then simply connect the three hot lines to L-1, L-2 and L-3 in any order. If the electric motor rotation is wrong, exchange any two lines. If your incoming power is "delta" connected having two 125 volt lines and one 200 volt line, then connect



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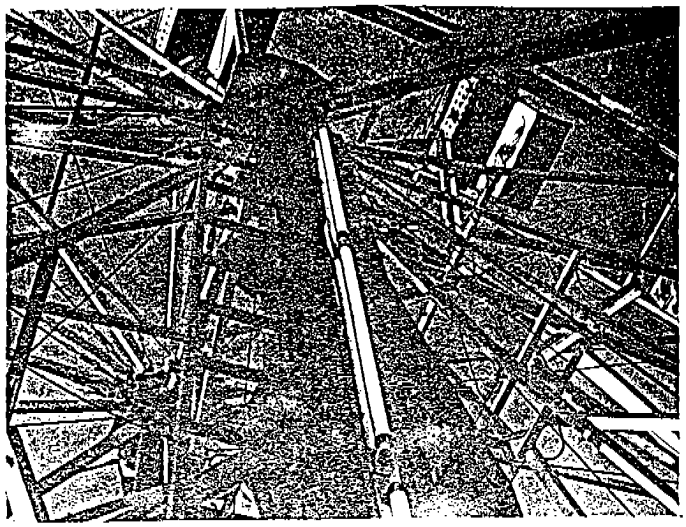

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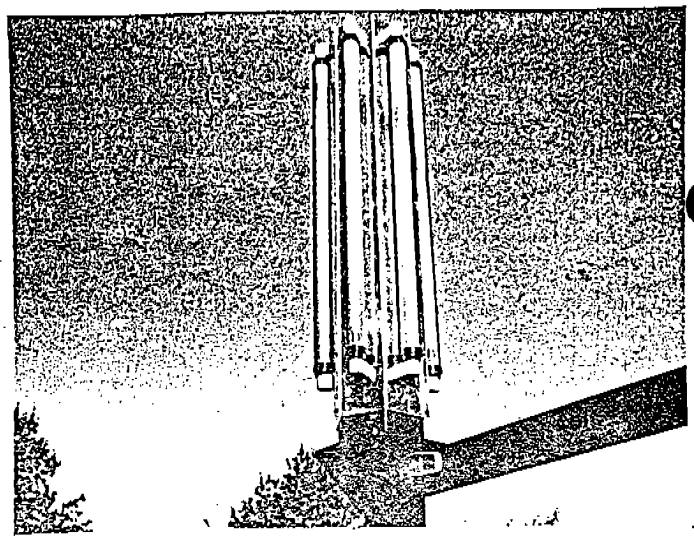

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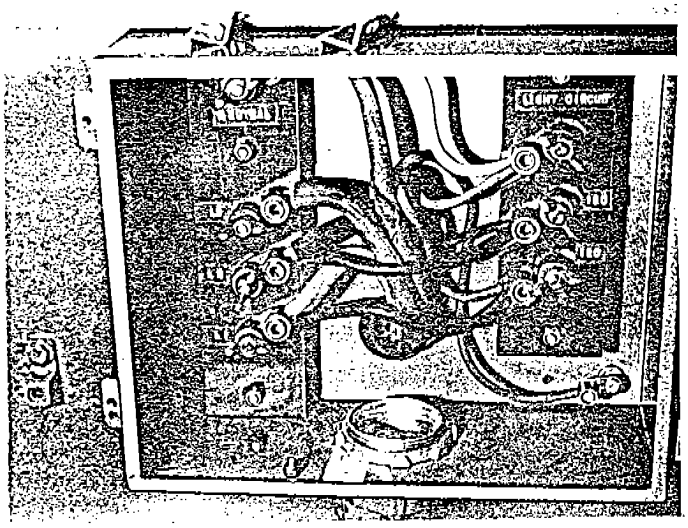

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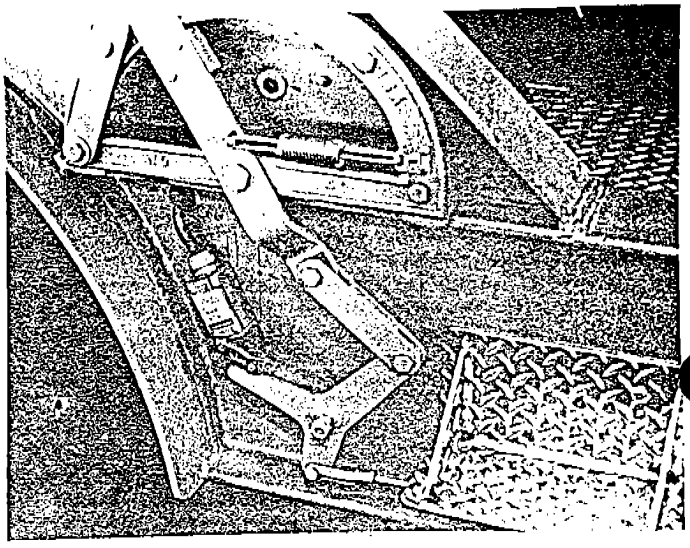

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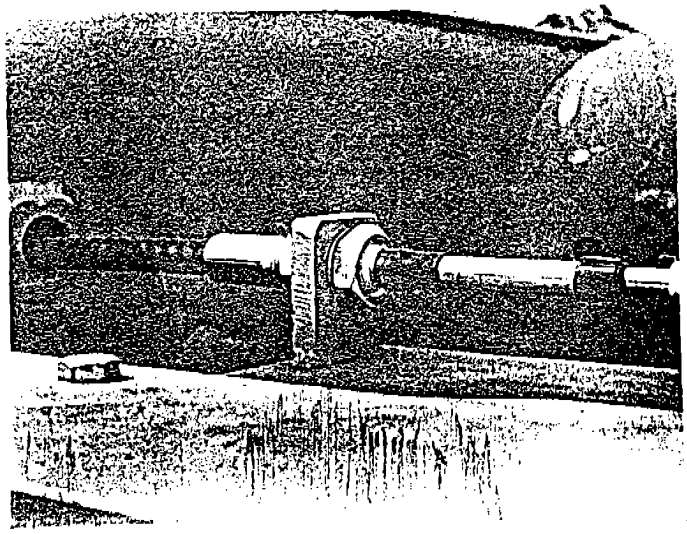

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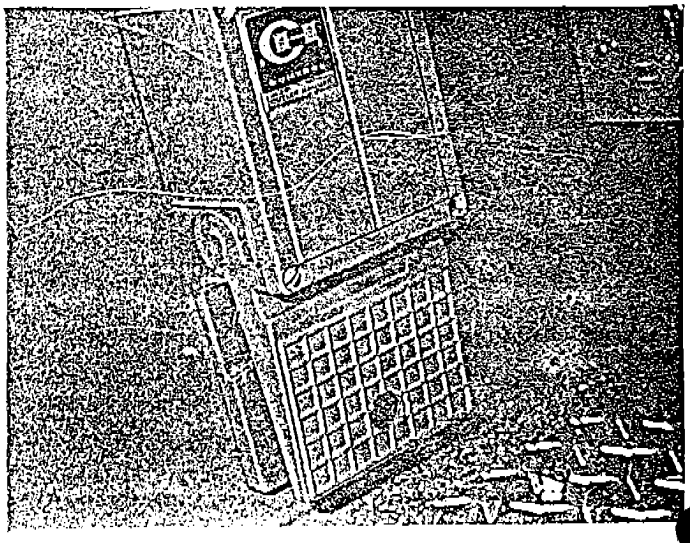


Picture No. 99

the 125 volt lines to L-1 and L-2, and the 200 volt line to L-3. BE SURE THE 125 VOLT LINES ARE CONNECTED TO L-1 AND L-2. IF THE 200 VOLT LINE SHOULD GET CONNECTED TO L-1 OR L-2, IT WILL BE CONNECTED TO YOUR LIGHTING CIRCUIT AND PROMPTLY BURN UP YOUR BALLASTS. If motor rotation is wrong, exchange L-1 and L-2. READ AGAIN "IF MOTOR ROTATION IS WRONG, EXCHANGE L-1 AND L-2". Otherwise, you will be introducing 200 volts into the lighting circuit.

The mechanical ground connection is brazed to the trailer frame, just ahead of the entrance box. If there is no ground connection in your power source, you should provide an electrical ground as described in the National Electrical Code and connect that to the brazed ground lug to the left of the terminal box. (Picture #96)

The following information has been taken directly from the National Electrical Code.

250-81. WATER PIPE. A metallic underground water piping system, either local or supplying a community, shall always be used as the ground electrode where such a piping system is available. Where the buried portion of the metallic piping system is less than ten feet (including well casings bonded to the piping system) or there is some likelihood of the piping system being disconnected, it shall be supplemented by one or more of the grounding electrodes recognized in Sections 250-82 and 250-83.

250-82. OTHER AVAILABLE ELECTRODES. Where a water system as described in Section 250-81 is not available, the grounding connection may be made to any of the following:

(a) The metal frame of the building, where effectively grounded.

(b) A continuous metallic underground gas piping system.

(c) Other local metallic underground systems, such as piping, tanks, and the like.

250-83. MADE ELECTRODES. Where electrodes described in Sections 250-81 and 250-82 are not available, the grounding electrode shall consist of a driven pipe, driven rod, buried plate or other device approved for the purpose and conforming to the following requirements:

(a) PLATE ELECTRODES. Each plate electrode shall present not less than 2 square feet of surface to the exterior soil. Electrodes of iron or steel plates shall be at least 1/4 inch in thickness. Electrodes of non-ferrous metal shall be at least 0.06 inch in thickness.

(b) PIPE ELECTRODES. Electrodes of pipe or conduit shall be not smaller than of the 3/4 inch trade size, and where of iron or steel, shall have the outer surface galvanized or otherwise metal-coated for corrosion protection.

(c) ROD ELECTRODES. Electrodes of rods of steel or iron shall be at least 5/8 inch in diameter. Approved rods of non-ferrous materials or their approved equivalent used for electrodes shall be not less than 1/2 inch in diameter.

(d) Electrodes should, as far as practicable, be embedded below permanent moisture level. Except where rock bottom is encountered, pipes or rods shall be driven to a depth of at least 8 feet, regardless of size or number of electrodes used. Pipes or rods, when less than standard commercial length, shall preferably be of one piece. Such pipes or rods shall have clean metal surfaces and shall not be covered with paint, enamel or other poorly conducting materials. Where rock bottom is encountered at a depth of less than 4 feet, electrodes shall be buried in a horizontal trench, and where pipes or rods are used as the electrode, they shall comply with Paragraph 250-83 (b and c) and shall be not less than 8 feet in length. Each electrode shall be separated at least 6 feet from any other electrode, including those used for signal circuits, radio, lightning rods, or any other purpose.

250-84. RESISTANCE. Made electrodes shall, where practicable, have a resistance to ground not to exceed 25 ohms. Where the resistance is not as low as 25 ohms, two or more electrodes connected in parallel shall be used.

Continuous metallic underground water or gas piping systems in general have a resistance to ground of less than 3 ohms. Metal frames of buildings and local metallic underground piping systems, metal well casings, and the like, have, in general, a resistance substantially below 25 ohms. It is recommended that in locations where it is necessary to use made electrodes for grounding interior wiring systems, additional grounds, such as connections to a system ground conductor, be placed on the distribution circuit. It is also recommended that single electrode grounds when installed, and periodically afterwards, be tested for resistance.

TWELVE VOLT LIGHTING

The standard 12 volt highway running lights are used only when on the highway, with the trailer electrically connected to the towing tractor.

OPERATING THE HY-5 II BIG ELI WHEEL

There are only two controls to use when operating the HY-5 II. The brake ratchet handle on the right side of the trailer, near the loading platform, controls the hydraulic brakes and the hydraulic motors that drive the Wheel. Some of the linkage connected to the brake ratchet handle is shown in Picture #97. The linkage pushes and pulls on a flexible cable that extends all the way to the front of the trailer (Picture #98). The other control for the operator to use is the foot switch (Picture #99).

Move the brake ratchet handle toward the front of the trailer to start the Wheel turning. Do this smoothly and gently, and the Wheel will begin turning without a jerk. Notice that when you move the handle back to the vertical position the Wheel will slow down. This is hydraulic braking built into the system. However, in order for the loading platform to be raised, the handle must be moved firmly to the rear; to the position shown in Picture #97. This actuates the microswitch that controls the solenoid-operated hydraulic valve that sets the hydraulic brakes. These brakes grip directly onto the circular drive rim (Picture #100).

The loading platform (Picture #101) is hydraulically operated. It cannot be raised when the Wheel is turning; it will operate only when the brakes are set. With the brakes set, touching the foot switch actuates a solenoid-operated hydraulic valve which extends the cylinder under the loading platform, raising the platform to its loading position.

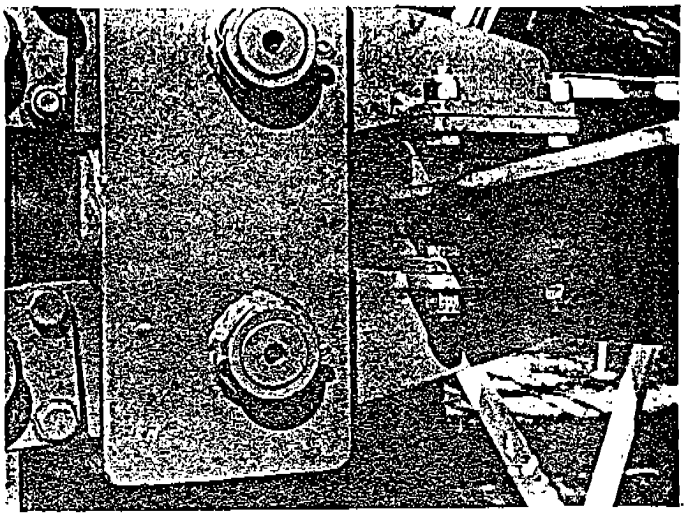
It is not necessary to hold your foot on the foot switch because a momentary contact is all that is needed. The cylinder will extend all the way by itself. The cylinder has a cylinder lock on it, which prevents the cylinder rod from retracting until pressure is applied to the other port. The purpose of the cylinder lock is to hold the loading platform in its elevated position and not allow it to drift downward.

It is very important that the loading platform be held rigidly. All air must be bled out of the hydraulic lines to prevent the cylinder from having a springy or spongy support for the loading platform. Any time you find that the loading platform is not holding its raised position firmly, do not operate the Wheel and contact the factory. We believe that the components we have installed are highly reliable, but this is a design feature that must work properly or it can be hazardous to your passengers when they get on or off the ride. Therefore, we urge your continuing observation of this cylinder locking operation to be sure that it operates properly.

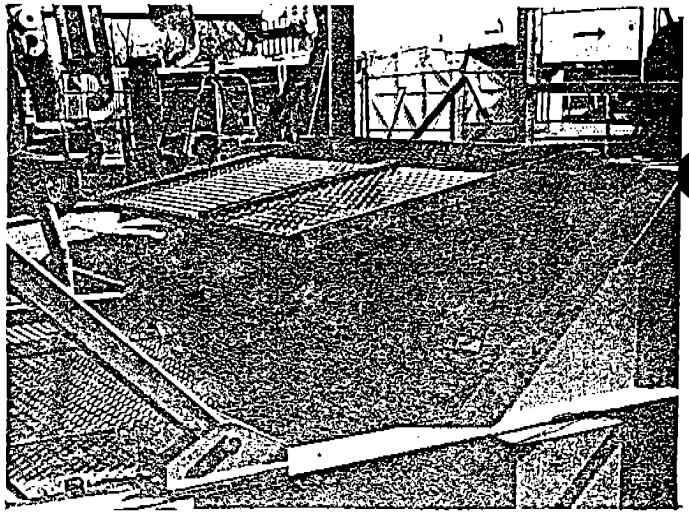
Try to position the seat so that the edge of the footbottom is approximately centered on the loading platform. When you are in the best position, pushing down on the footbottom against the loading platform will tip the seat forward slightly and this will assist the passengers in getting out of the seat. If you stop too late, the seat may actually be tipped back, and this will make getting up out of the seat even more difficult. Also, if you are close to the forward edge of the loading platform, and if the footbottom is not properly locked, it is possible for the footbottom to slip over the edge, which would then allow the standing passengers to fall. If the seat is stopped too soon, when you push down on the footbottom the seat will tip too far forward; this will probably not be a disadvantage for the passengers leaving the seat, but the incoming passengers might find it difficult to remain seated on such a tilted seat. There is quite a wide middle range which you will find will work quite satisfactorily. We just want you to understand that if you stop the seat too far either way you will have some problems that can be avoided if you stay in the center of the loading platform.

With the seat stopped, pull out the plunger and throw open the handlebar as far as it will swing easily. Then hold the footbottom against the loading platform as the passengers enter or leave the seat.

With a little practice you should have no difficulty spotting the seats. The way you operate the brakes is different from operating a ground model or the original HY-5. Instead of brake shoes inside the bull gear, the HY-5-II has caliper brakes that grip the drive rims. They are solenoid operated and <u>have no feel</u>. They are for holding, only. The running motors and the variable displace ment pumps are used for slowing the wheel to a stop. Then, at the stop, the operating handle is pulled back the last inch, approximately, which sets the brakes. It is different, but not difficult.



Picture No. 100



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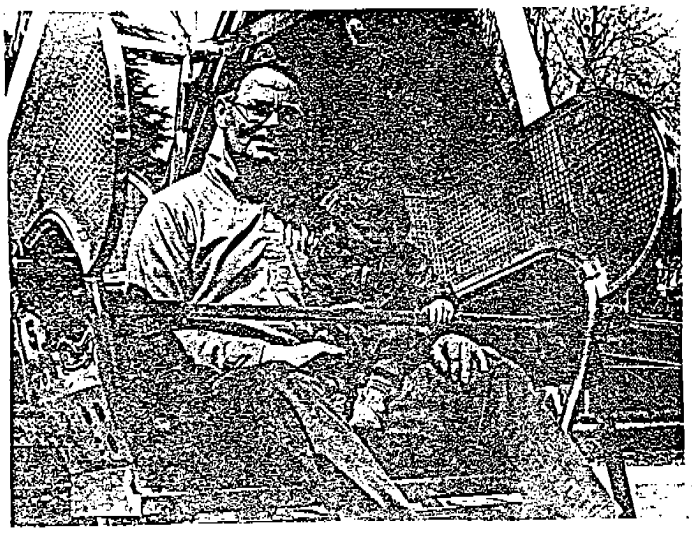
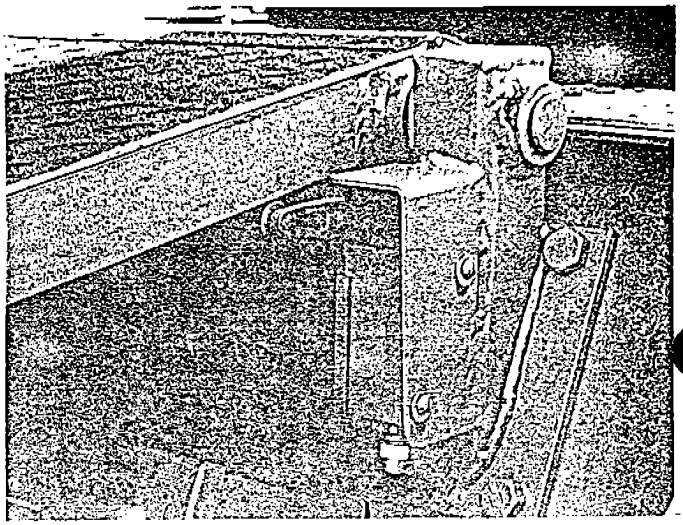


Picture No. 102



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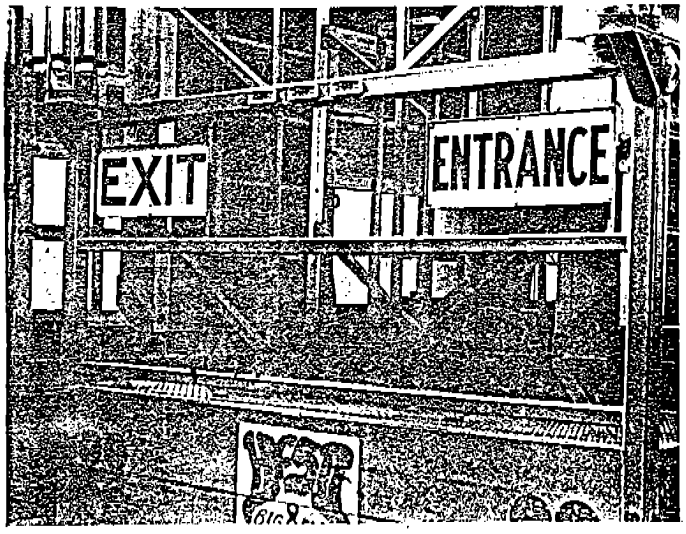
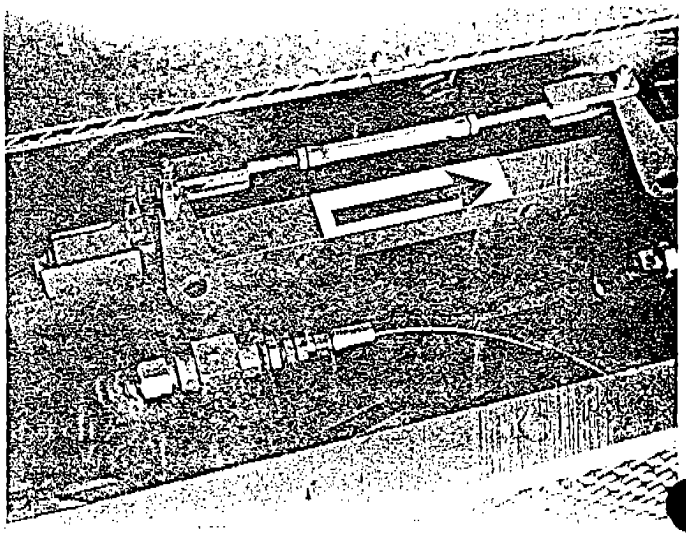


Picture No. 104



Picture No. 105

After the incoming passengers are seated, or the unloaded passengersd have cleared the loading area, and you are ready to start the wheel; close the handlebar making sure that the plunger on the side of the seat has locked the handlebar securely shut. (Picture No. 102)

Notice that you do not have to lower the loading platform. As you move the brake ratchet handle forward to operate the Wheel the loading platform is moved dowm automatically. A microswitch on the loading platform will prevent the brakes from being released until the loading platform has been lowered all the way. (Picture No. 103)

While the Wheel has sufficient power to operate in a severe out-of-balance condition, it will operate best, with the least wear on the equipment, when the Wheel is kept reasonably balanced. With a little care in loading the Wheel, balance should be no problem. A good procedure is to load seat #1, then turn the Wheel to seat #7. Then load #8, then #2, then #3, then #9, then #10, then #4, then #5, then #11, then #12, and finally #6. In other words, if you follow the practice of having only one seat out of balance at a time, turning the Wheel will never be a problem. If you get the Wheel too much out of balance you may not be able to pull the weight over the top. What will happen then is that the hydraulic drive will stall. This is not likely to happen to the HY-5-II because of the greater horsepower than was available with the original HY-5. In any event, it will not damage the drive.

If there is an out-of-balance load up on the backside of the Wheel, there is a short interval between releasing the brake and engaging the hydraulic motors. This can sometimes allow the Wheel to roll backward slightly. Learn to minimize this rollback. If a seat is just beyond the loading platform, and it is swinging as the Wheel rolls backward, it is possible for the footbottom to hook under the edge of the loading platform. This would then tend to roll the seat over and possibly pitch the passengers out, so do not allow the passengers to rock the seats, or the Wheel to roll backward.

The two stairways are marked "Entrance" and "Exit". If you will keep all of the incoming passengers at the entrance stairway they will be where you can watch them and prevent their climbing the stairs before the Wheel stops. (Picture No. 104)

Each stairway is equipped with handrails, and there is one cross the back of the trailer, but from that point until the passenger is seated there is no handrail and you will no doubt find it helpful to steady the passengers as they enter or leave the seat. Abrasive strips have been placed on the loading platform, the steps, and the flooring in this area to assist in providing a firm footing where there is no handrail. Never paint over these abrasive strips or they will lose their effectiveness. Watch that the passengers do not trip over the hinged flap at the rear edge of the loading platform. This flap is necessary in order to cover a potential pinch point, but because it does rise slightly above the level of the loading platform some persons may trip on it particularly when they are leaving the seat, so you should be ready at all times to steady them if they should trip.

A reminder again: Be sure that the electric motors are turning in the right direction. When viewed from the front of the trailer the motor shafts should be turning in a clockwise direction. The variable displacement hydraulic pump

d mounted on each motor is made to operate only in this direction; if you turn it the wrong direction the internal charge pump will not operate and expensive damage can occur in a short time. Picture No. 105 shows the arrow in front of the motors, showing the direction the top of each motor shaft should be turning.

Do not jerk the hydraulic motors in starting or the brakes in stopping. This rocks the seats, and some passengers will not like it. The main purpose in any amusement riding device is to please the passengers so that they will come back and bring their friends with them.

Do not get careless with your operating methods. Big Eli Wheels have always been known as the ride for all ages, from small children to the oldest, who want a pleasant, safe, high ride.

Many millions of people have ridden Big Eli Wheels with pleasure and in safety. However, the operator has the responsibility for insuring a safe ride to all passengers. The operator must watch the ride at all times, and must refuse rides to any persons whose condition, in his opinion, might contribute to a hazard to themselves or others.

How fast should a HY-5-II operate? It has been adjusted at the factory to operate at 6-3/4 revolutions per minute. It should not be operated faster than that.

Here are some safety rules for HY-5-II operators:

1. Completely inspect and test run the Wheel before each operating period

2. Assist patrons on and off the Wheel when necessary.

3. Be sure the handlebars are properly fastened before starting operations, and that the seat hanger castings on the ends of the seats are each equipped with seat locks.

4. If the Wheel is being misused by patrons, shut the Wheel down until the condition is corrected.

5. Never let anyone enter the stairs while the Wheel is turning. Anyone climbing the stairs could be hit by the seats. Always keep them off the stairs until the Wheel is stopped.

6. Persons who are intoxicated or under the influence of drugs must not be allowed on the Wheel.

7. Smoking by patrons should not be permitted since hot ashes can be dropped or blown into the eyes of other patrons on the Wheel.

8. If an unusual noise or condition develops while the Wheel is operating stop the wheel and get to the bottom of the trouble before you begin operating again.

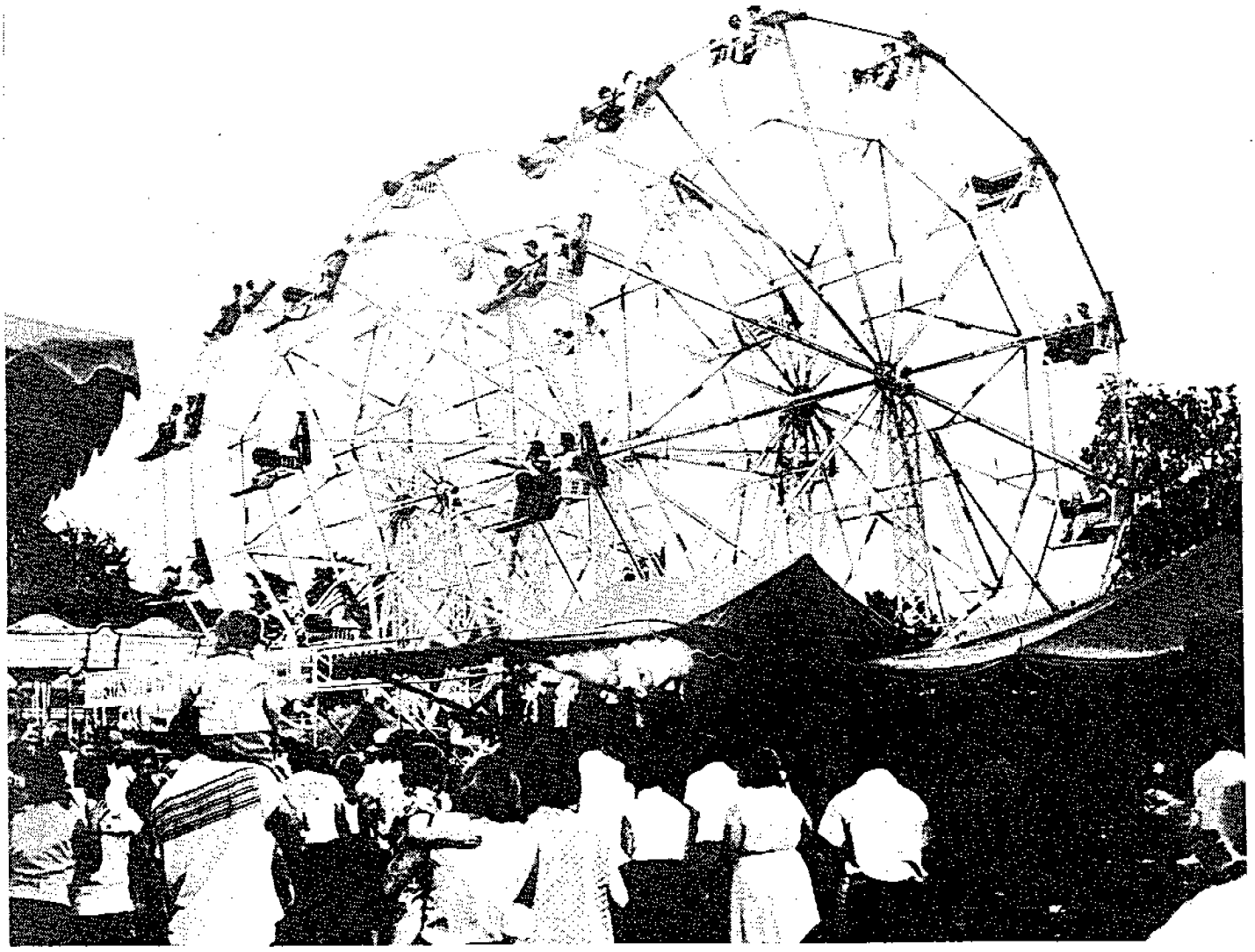
Instructions

for

Erecting and Operating

the

BIG ELI WHEELS



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CONTENTS

GENERAL DESCRIPTION, LOCATION, AND ERECTING INSTRUCTIONS

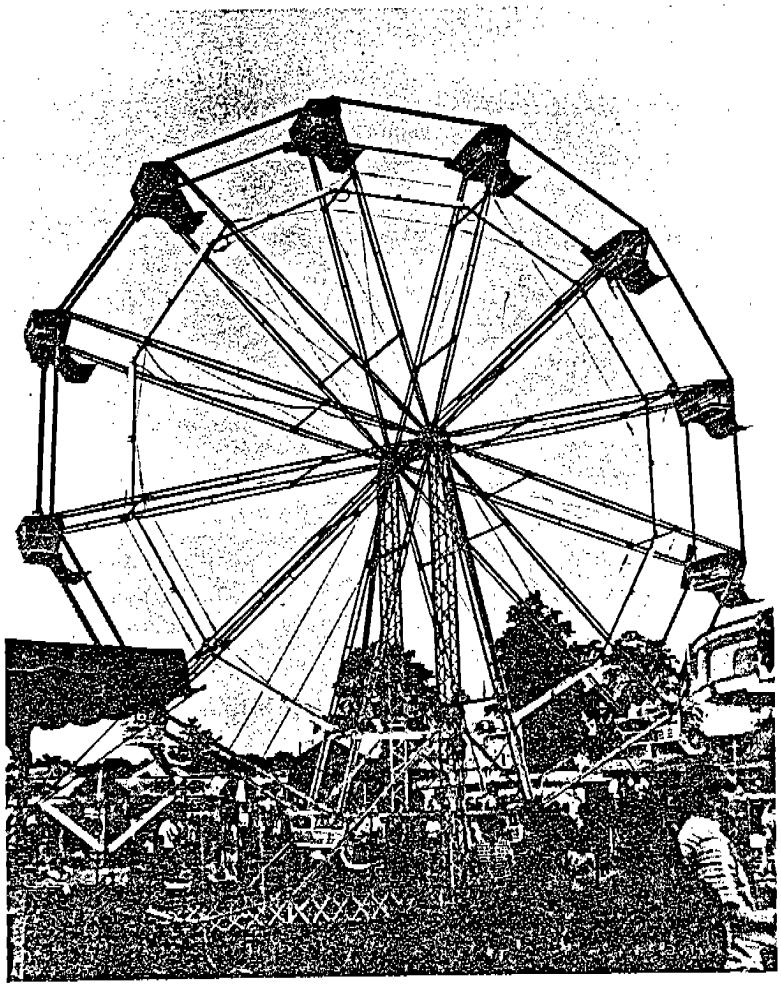
Eli Bridge Company manufactures three sizes of ground-model BIG ELI WHEELS. All three are similar in design and construction, and are erected in much the same manner. The WHEELS differ in the number of seats carried, the overall dimensions, and minor structural details. An operator who learns the proper method to erect one size of BIG ELI WHEEL should have little difficulty assembling either of the other two sizes, so long as he keeps in mind the minor differences pointed out in this Manual. Most of the photographs in this Manual show the erection of the largest BIG ELI WHEEL, the No. 16 "Aristocrat". In any case where essential differences exist between this BIG ELI WHEEL and the two smaller sizes, additional information and photographs are included to make clear these differences.

The following is a description of each size of BIG ELI WHEEL.

The "STANDARD" No. 5 BIG ELI WHEEL

Overall height of the No. 5 BIG ELI WHEEL is 40 ft. 3 in. It carries 12 standard BIG ELI seats, each of which can carry two or three adults. Standard equipment with the WHEEL includes: fluorescent outside light circle (star equipment shown in the picture is also available); a ramp-type loading platform; a

gasoline power unit mounted on a power unit truck (or 10 HP, 208-220/440 volt, 60 cycle, three-phase electric motor, mounted on skids and slide rails); necessary crates and boxes; ropes with tackle blocks; and all tools and equipment needed for proper erection and operation of the ride. Electric wiring is 3-wire, 110 volt, grounded type. Designed with interchangeable features, the No. 5 BIG ELI WHEEL is quick and simple to erect for either park or portable operation. To erect, a space 28 feet deep by 27 feet wide is required. This space must be clear of branches and wires for a height of 45 ft. Weight of the No. 5 BIG ELI WHEEL and all equipment is approximately 11,877 lbs.



The "DELUXE" No. 12 BIG ELI WHEEL

Overall height of the No. 12 BIG ELI WHEEL is 45 ft. 3 in. It also has 12 standard BIG ELI seats. It has standard equipment similar to that on the No. 5 WHEEL. A space 31 ft. square is required to erect it, and the space must be clear overhead to a height of 50 feet to allow ample clearance for the ride when carrying passengers. Weight of the No. 12 BIG ELI WHEEL and all equipment is approximately 12,883 lbs.

The "ARISTOCRAT" No. 16 BIG ELI WHEEL

Overall height of the No. 16 BIG ELI WHEEL is 55 ft. 2-3/4 in. It has 16 standard BIG ELI seats. This WHEEL was designed for large park use, but since it has interchangeable parts it can be operated portably. Standard equipment includes: fluorescent outside light circle and eight-point star lighting equipment; 15 HP 208-220/440 volt, 3-phase, 60 cycle electric motor mounted on skids and slide rails; necessary crates and boxes; ropes with tackle blocks; and all tools and equipment needed for proper erection and operation of the ride. All lighting equipment is of the 3-wire, 110 volt, grounded type. To erect the No. 16 BIG ELI WHEEL a space 37 ft. deep by 36 ft. wide is required. This space must be clear of branches and wires for a height of 60 ft. to allow ample clearance for the ride when carrying passengers. Total weight of the No. 16 BIG ELI WHEEL and all equipment, including electric motor and lighting, is 19,637 lbs.

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Each seat swings freely on pins at the ends of the spokes, which are spaced from each other by rim sections and spoke crossbars. The WHEEL is internally braced by spoke cables(there are two sizes of spoke cables on the No. 16 model), and by cross and parallel cables. The spokes are pinned into

the hubs, which are supported by the main axle riding on the tops of the towers. Each tower is a two-part, hinged structure, that is braced front to back by bases, kneebraces, and corner guy cables, and is braced from side to side by wind-braces and A-braces.

Erecting Directions for a BIG ELI WHEEL

Erecting a BIG ELI WHEEL is a simple operation and briefly consists of the following steps:

1. Setting the foundation plate.

2. Erecting the two stub towers, and pinning to them the four bases, the kneebraces, and base crossbars. The brake support finger must be on the base section nearest the electric motor (or power unit) before it is assembled to the tower. Lay out the drive cable.

3. Assembling the gearing.

4. Assembling the top towers, axle, and hubs with electric rings, wind-braces and A-braces on the sides of the towers, and hoisting them into position.

5. Connecting the corner guy cables and blocking the outer ends of the bases until the towers are plumb.

6. Assembling the WHEEL by putting up one pair of spokes and one pair of rims at a time until the WHEEL is assembled.

7. Adding the remaining WHEEL cables and truing the WHEEL.

8. Attaching the woodrims and idler, and fitting the drive cable to the WHEEL.

9. Installing the lights.

10. Positioning the loading platform.

11. Hanging the seats, locking them in place, and unfolding the foot-bottoms.

You should be able to assemble your BIG ELI WHEEL in a very few hours. For the man who has seen or operated a BIG ELI WHEEL the above instructions are about all that are necessary. All similar parts are interchangeable. Although the erection of a BIG ELI WHEEL is not difficult, the following directions are

explained very carefully so that the WHEEL operator will know exactly what he must do to assemble the WHEEL properly. Fast and safe erection is of more concern to the portable operator than it is to one who is able to leave his ride in one location but in either case it is important that the WHEEL be assembled properly and safely.

Location

After your have decided where you want the WHEEL to stand and which way you want it to face, you will need a fairly level spot for erection. This space must be clear of branches and wires to allow ample clearance for the ride when carrying passengers.

The space required will depend on the model of BIG ELI WHEEL, as pointed out previously in the descriptions of the three models.

While it is possible to set the WHEEL on a slope, the base of the WHEEL must be leveled in order for the WHEEL to operate properly and the use of a slope may require extensive blocking or digging in order to level the WHEEL.

For permanent installations, most operators prefer to install concrete piers for anchoring their BIG ELI WHEELS. Directions for installing piers for each size of WHEEL will be found in the back of this Manual.

DIRECTIONS FOR ASSEMBLING THE FOUNDATION PLATE, STUB TOWERS, AND BASES

Foundation

As you stand in front and face toward the WHEEL the tower to your right is the gear tower and the one to your left is the "off" tower. The foundation plate is not the same on each end. One end has an extra plate welded across the top for the support of the idler stand, and this end must go under the gear tower. It is at the far end in Picture No. 1, as indicated by the arrow. Be sure that the foundation plate is on a firm base because it must carry the entire weight of the WHEEL and passengers. If it is necessary to block the foundation plate, block under it only where the towers will be supported.

The foundation plate must not only be firmly blocked, but it must also be level. Using the level supplied with your WHEEL, shim under the foundation plate until it is as level as you can make it, as shown in Picture No. 2. Any blocking used must be securely located. Occasionally poor blocking gets loose and causes the WHEEL to shift out of line, which causes the drive cable to become misaligned with the woodrims and the drive sheave.

Towers, Bases, and Brake Support Finger

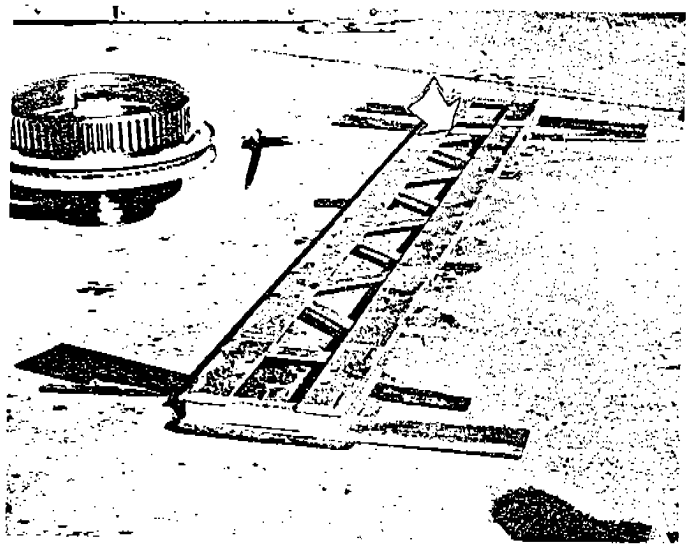
Bring out the towers and bases, as shown in Picture No. 3. Set the base of each tower on the foundation plate and let the upper end rest on the ground. Picture No. 4 shows that the "off" tower has a slot just the above the bottom plate, and this slot must go to the outside for inserting the windbrace crossbar later on. The gear tower shown in Picture No. 5 is for a No. 16 WHEEL and has a part of the tower extended to one side. This extended side goes next to the rotating WHEEL assembly. The No. 5 and No. 12 gear towers are not extended in this way. They can best be positioned by laying the gear tower on its side so that the brake bar plates stick up. See the arrows in Picture No. 5. Do not turn these plates down toward the ground when you lay down the tower. If the plates become bent, the brake expander bar will not work properly.

Begin the assembly by raising the "off" tower. See Picture No. 6. Be sure that the base of the tower is on the foundation plate and that is it clean so that it will seat properly. Have one man brace his weight against the lower end of the tower to keep it from sliding, while the others raise it to an upright position. Shift it around until it drops down within the narrow bars that surround the base of the tower on the foundation plate.

Then, while one man holds the tower, two others slide one of the bases part way into the tower slots. See Picture Nos. 7 and 8. All four bases are interchangeable so it does not make any difference which one is used. Next, fit the second base to the "off" tower, as in Picture No. 9.

Raise the gear tower as in Picture No. 10, making sure that the two brake bar plates on the gear tower are toward the front of the WHEEL. If necessary, you can turn the tower around fairly easily after it is raised. Slip the front base into the gear tower, as in Picture No. 11. Before inserting the rear base you must install the brake support finger. The one shown in Picture No. 12 is used only on the No. 16 WHEEL, and the one in Picture No. 13 fits only the No. 5 and No. 12 models.

The brake support finger is packed in the turnbuckle box, and is slid on top of the base with the extended lever pointed toward the rotating WHEEL assembly. When this is done the base can then be slid into the tower, as in Picture No. 14. Occasionally operators forget to install this piece, and the only proper way to install it when that happens is to take down the WHEEL. There have been some instances where operators have cut away the flanges of the angles at the top of the base so that the brake support finger could be slid on after the WHEEL was up. Do not do this because it seriously weakens the ability of your WHEEL to resist wind loads. The best procedure is: DO NOT FORGET THE BRAKE SUPPORT FINGER.



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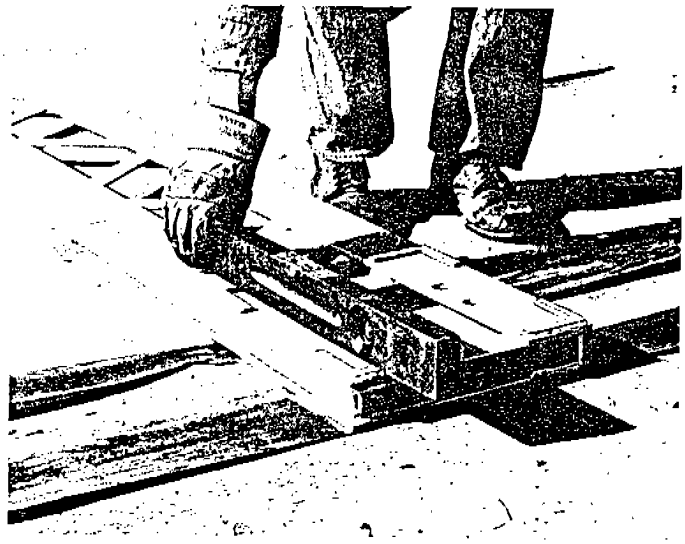

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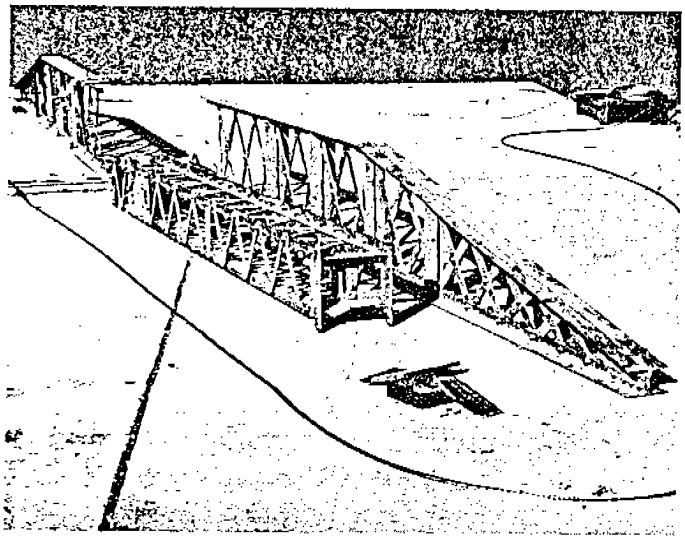

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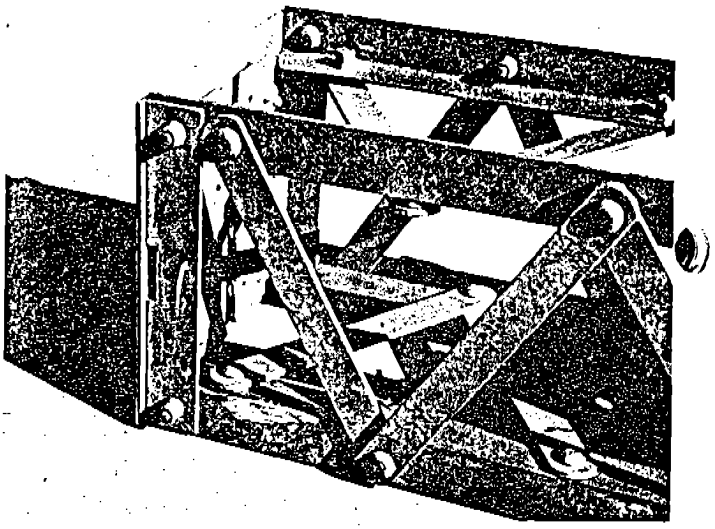

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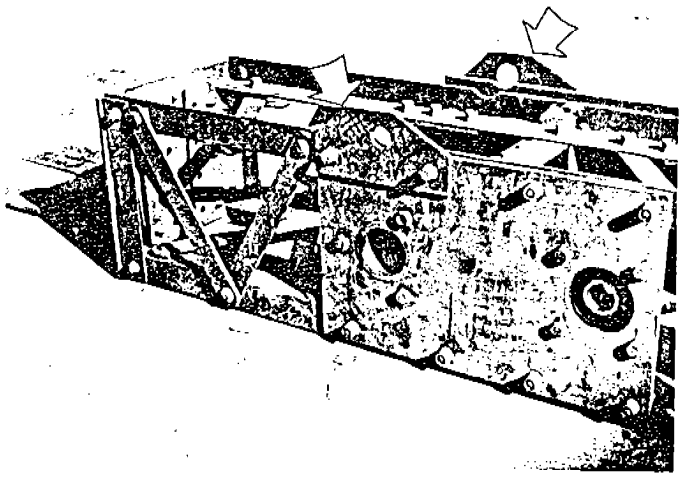

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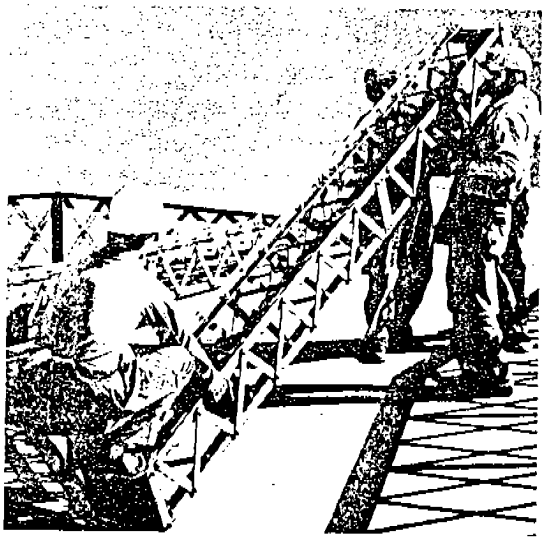

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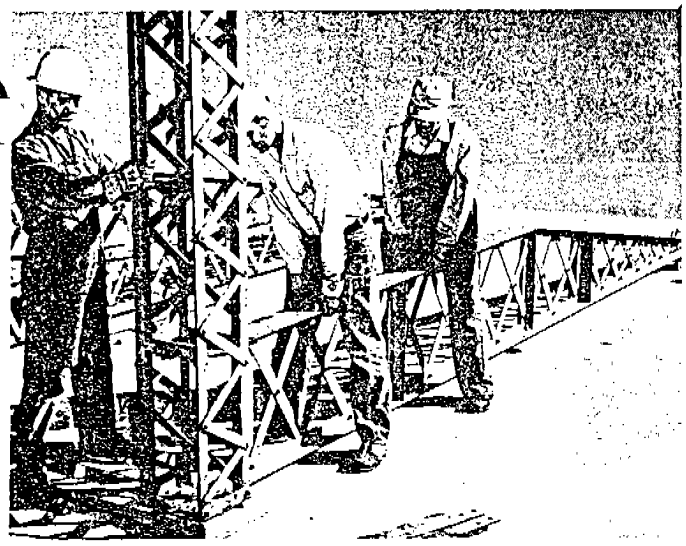

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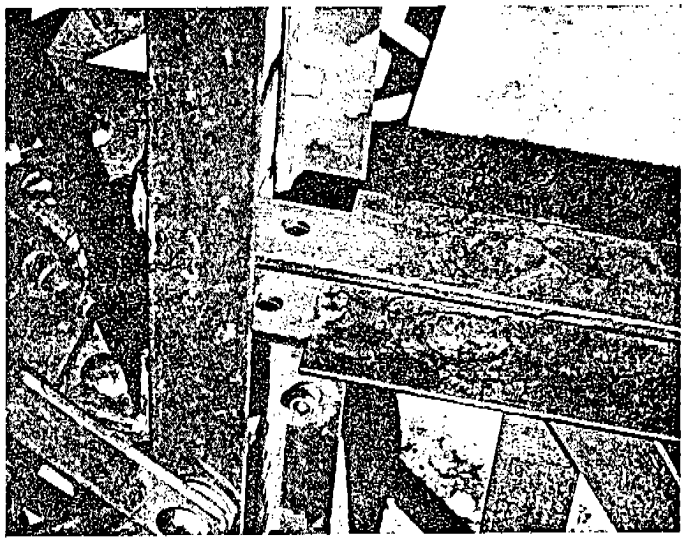

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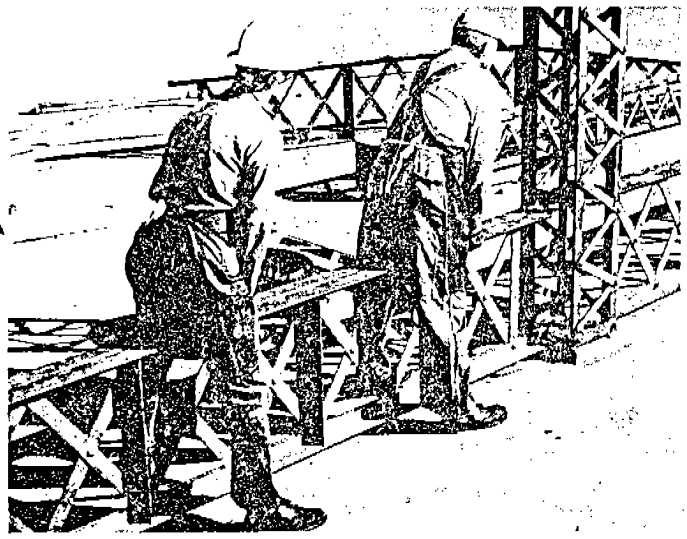

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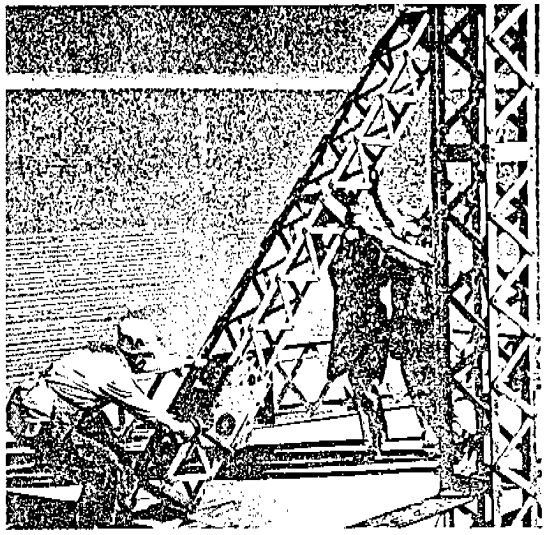

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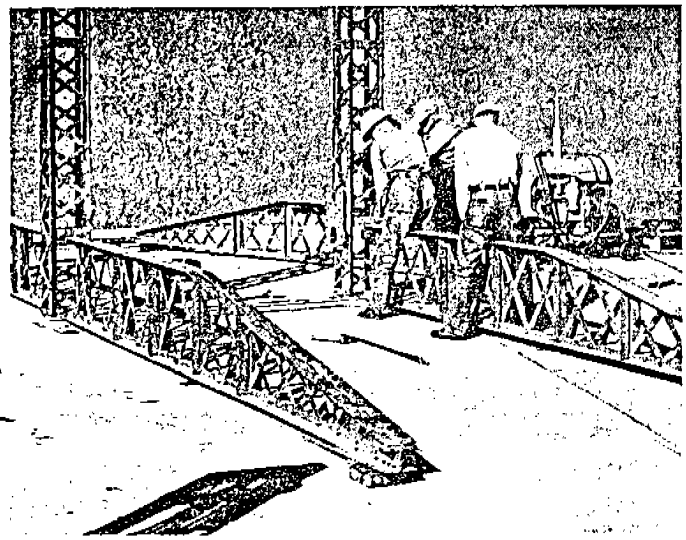

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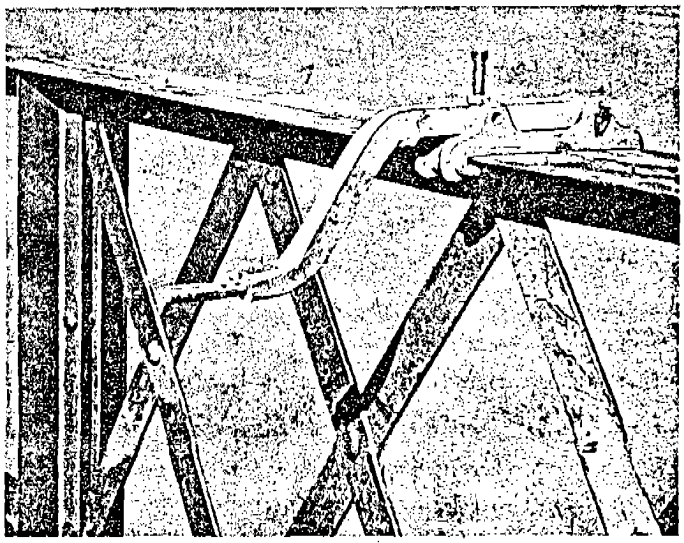

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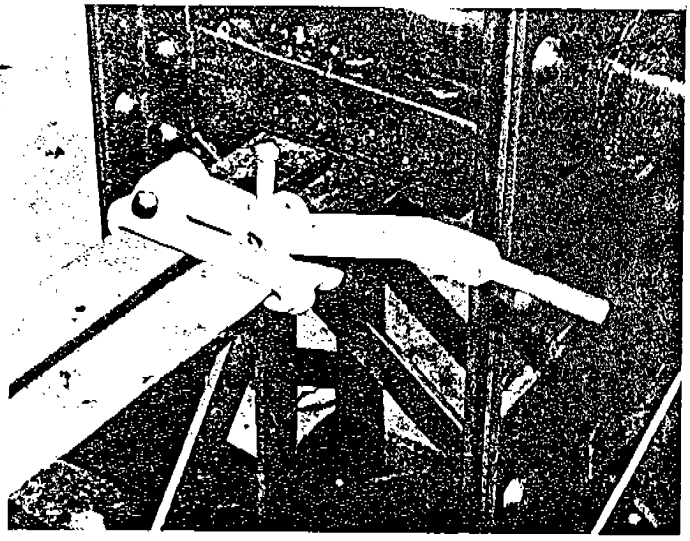

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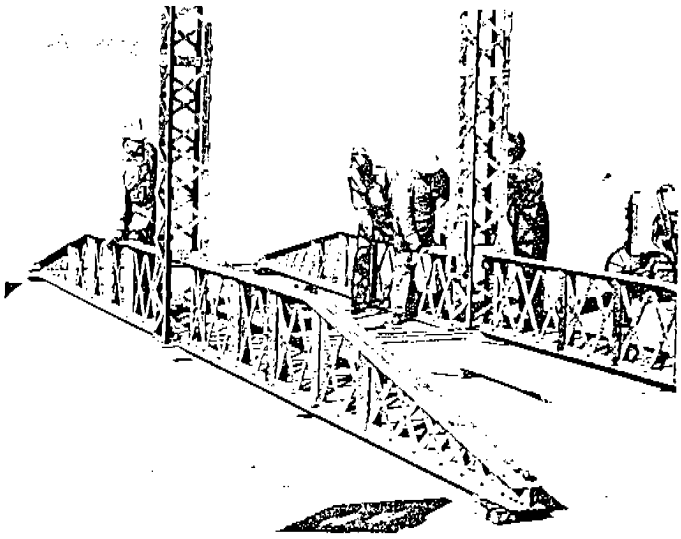

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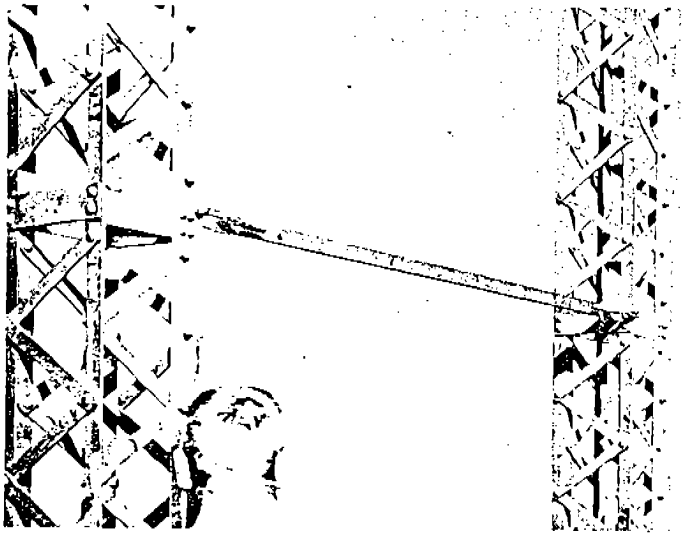

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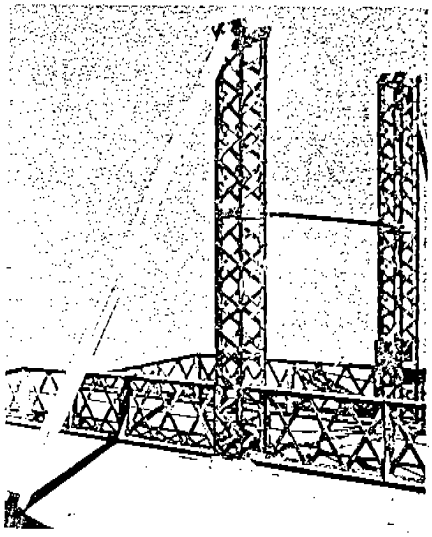

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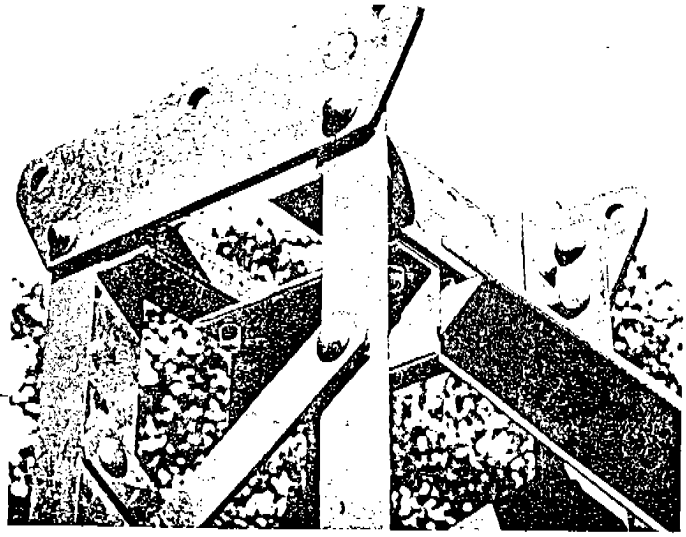

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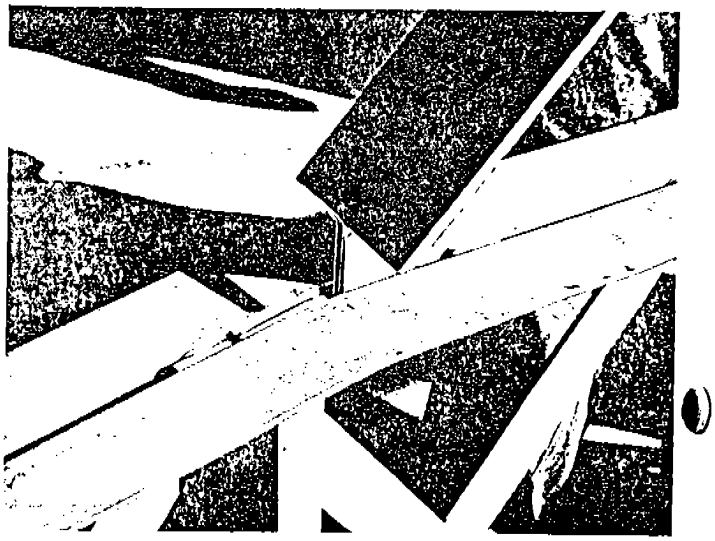


No. 18

On the No. 16 WHEEL, as soon as both towers are up install the tower spreader shown in Picture No. 15. Plumb the towers roughly and brace each tower with a prop pole. It is strongly recommended that you use this temporary bracing, because on at least one occasion a gust of wind blew over a tower at this stage. For the towers to be braced properly, the tower spreader and both of the prop poles must be used. See Picture No. 16. The No. 5 and No. 12 towers are not as tall, nor as heavy, and usually do not need this additional bracing.

Before going to the next step, check again to see if the two towers are located properly. As you stand in front and face toward the WHEEL, the "off" tower to your left should have the slot at the bottom toward the outside, and the brake bar plates on the gear tower should be on the side next to you. To check another way, the hinge pin holes at the tops of the towers are not the same size on each side of the tower. The larger pin holes in each tower should be to your left. Hinge pins are driven into the tower hinge plates from left to right. Consequently, the larger holes are on the left.

Check again to see that the brake support finger is on the right rear base and that it extends in toward the rotating WHEEL.

Assembling Kneebraces, Base Crossbars, and Windbrace Crossbars

One end of the kneebrace has two rivets (or huckbolts) close together, and it is this end which is inserted between the angles near the top of the stub tower. See Picture No. 17. The lower end drops between the angles that form the top of the base. See Picture No. 18. One man stands at the side of the tower and guides the kneebrace up into position as it is lifted and the lower end is dropped into the slot in the base, as in Picture No. 19. At this time the base is not pulled all the way into the tower and so the kneebrace will drop in easily. Next, position the second kneebrace.

At this point both of the kneebraces are loosely positioned. Using the crowbar and a chain or hook, as in Picture Nos. 20 and 21, pull the bottom of the base all the way into the tower. At the same time, lift and guide the top of the kneebrace into the tower kneebrace socket. When the base is positioned in the tower, drive in two No. 68 double head short base pins in the bottom of the base. These pins are made with a double head so that they can be pulled easily with the split end crowbar pin puller when taking down the WHEEL. See Picture No. 22.

Pin the second base in the same way. Occasionally it is necessary to move the base back and forth until the pin holes line up. If you sight along the tops of the bases you can tell which way to move the end of the base to line up the pin holes.

- Next install two pins in the tops of the bases. Use a crowbar to pry up under the outer end of the base, as in Picture No. 23. The base will pivot about the bottom pins and swing up so you can drive in two of the top pins. See Picture No. 24. When you do this, be sure the kneebrace is fitting into position properly on both upper and lower ends (Picture No. 25). This operation forces the kneebrace into its final position, locking it in place, as shown in Picture No. 26. The No. 16 towers may have a tendency to tip over at this time if they are not braced, so be sure the tower spreader and prop poles are in position. Pin the top angles of the other base to the tower.

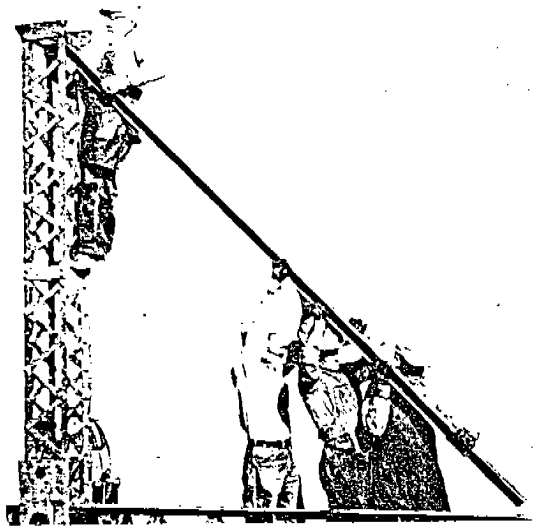
Now the entire weight is carried on the foundation plate and the outer end of each base is standing free of the ground. It would be wise to insert some temporary blocking under each end. After connecting the bases to the second tower, remaining pins can then be driven in. The same No. 68 double head base pins are used throughout the assembly of the bases to the towers.

Connect the bases on opposite sides to each other with the two base crossbars, which are located some distance in from the ends of the bases. The front base crossbar has two holes punched toward the center of the angle for connection to the loading platform. The rear base crossbar has two holes punched near one end for connection of the idler stand. Use the No. 68 double head base pins for connecting crossbars to bases. The vertical legs of the crossbar angles should be up and the horizontal legs of the two base crossbars should be turned toward each other. See Picture No. 27.

Insert windbrace crossbars in the outer slot on the bottom of each tower, so that the flat plates on the ends of the windbrace crossbars are down. Pin them to the towers with No. 68 double head base pins.

Next, plumb the towers from front to rear, as shown in Picture No. 28. Shim under the ends of the bases until the towers are plumb. Hold the level against the edge of the tower angle, as in Picture No. 29. Shim tightly under the ends of the bases until the towers are plumb, but under no circumstances should they be shimmed so much that the towers are raised off the foundation plate. Occasionally after the WHEEL is in operation, the blocking under the ends of the bases will become loose enough to require additional blocking or shimming. The WHEEL should not be operated unless the blocking is tight, and at all times the towers must be kept plumb.

At this point the stationary frame of the WHEEL is well stabilized from front to back, but it still lacks side to side bracing, so you should keep the tower spreader and prop poles in place against the towers.



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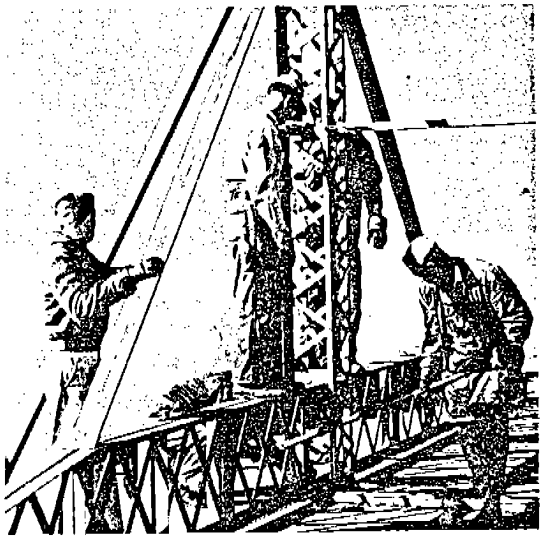

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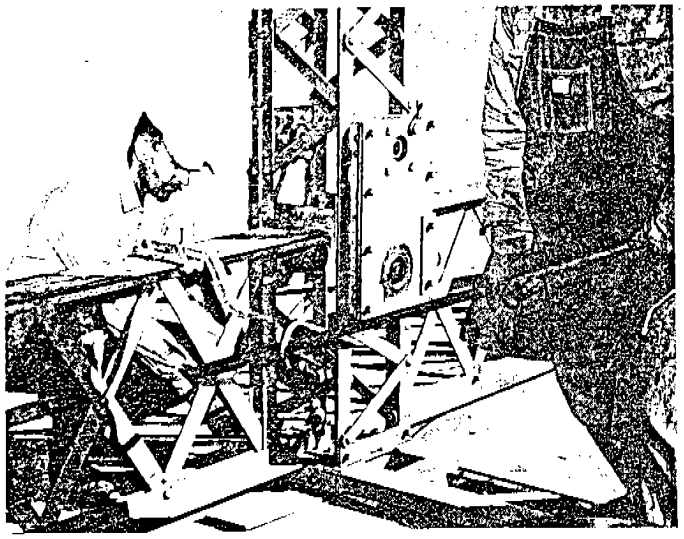

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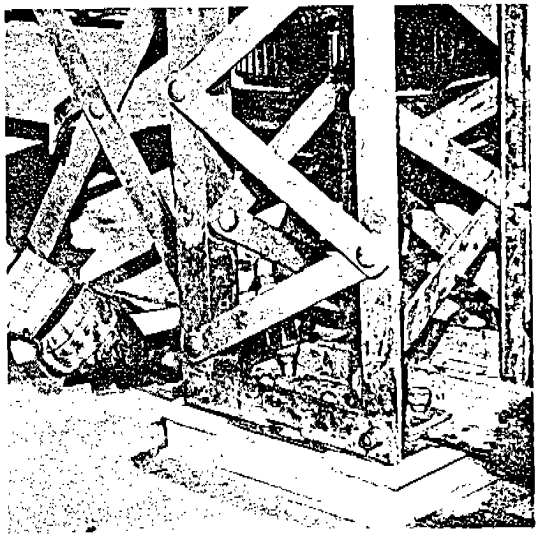

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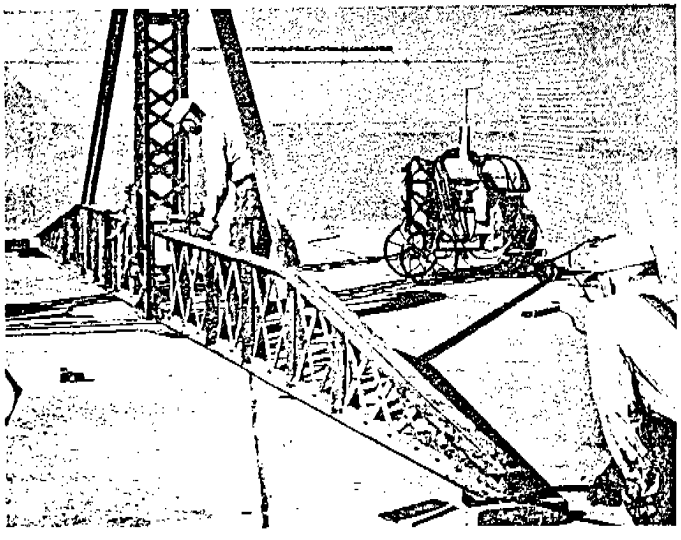

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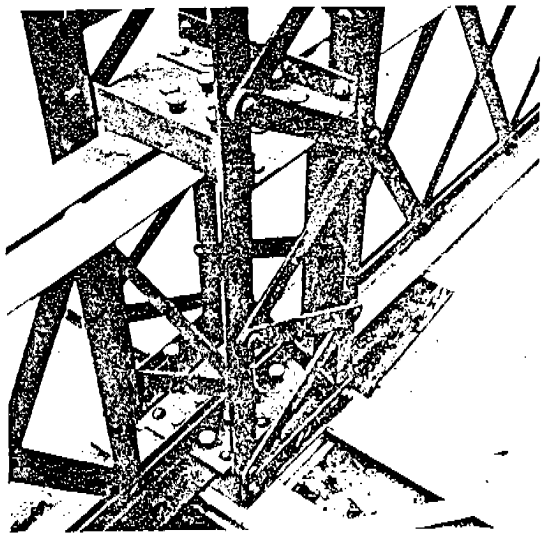

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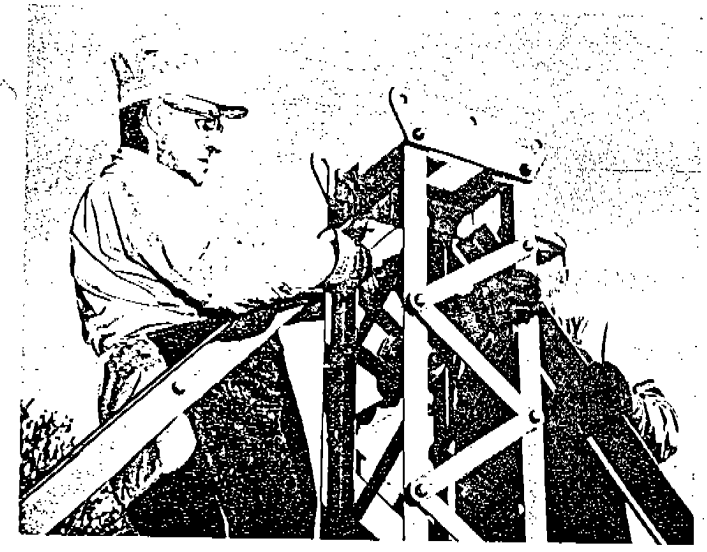

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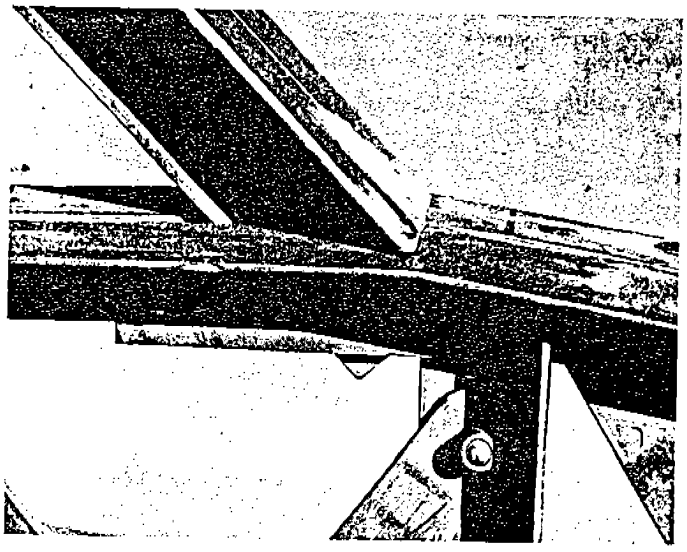

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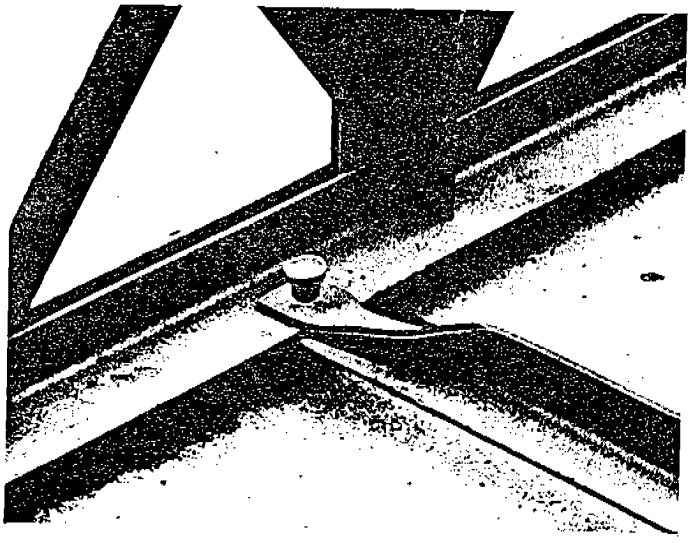

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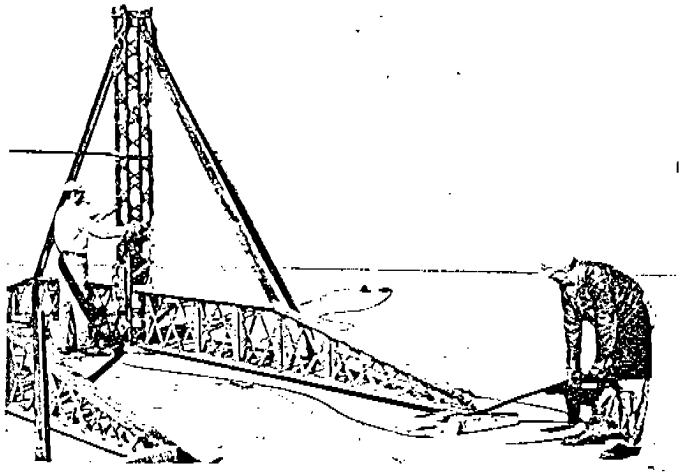

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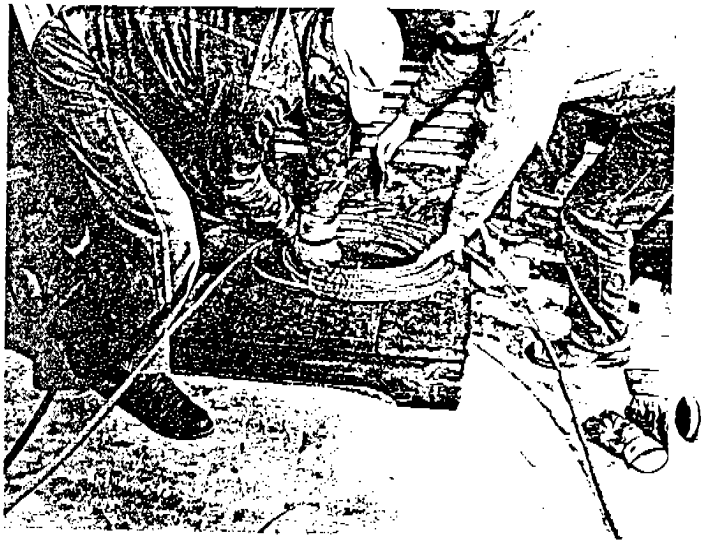


No. 30

Next, as shown in Picture No. 30, set your drive cable off to the right beyond the gear tower and uncoil enough of it to go over the gear tower and lie on the ground around the two bases on the right side (or drive side) of the WHEEL. When the WHEEL is all assembled then the drive cable will be in position for you to install it on the WHEEL. You will make a lot of work for yourself if you do not position the drive cable at this time.

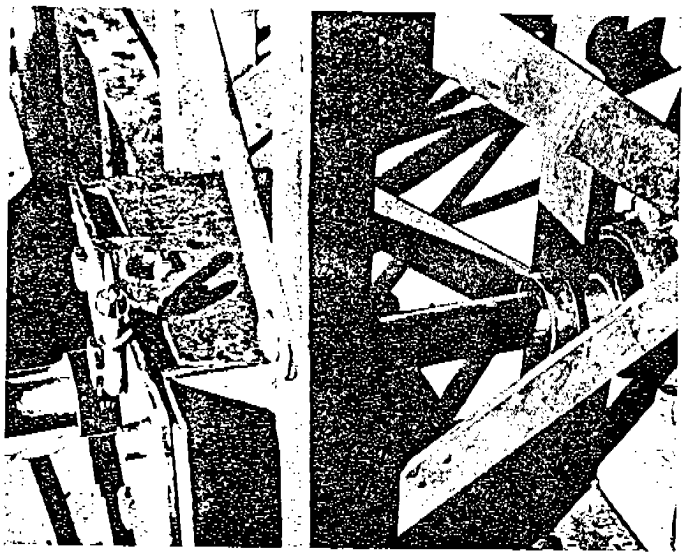
DO NOT FORGET IT.

DIRECTION FOR CONNECTING THE DRIVING GEARS, CLUTCH, BRAKE, AND ELECTRIC MOTOR OR POWER UNIT.

The first step is the installation of the clutch, which is delivered and carried assembled in its own crate. Examining the clutch, you will find that one end of the countershaft has two keyways for the 36-XX Fiber Pinion, while the other end is smooth. There are two sets of holes in the tower plates. The clutch goes in the top set. No. 5 and No. 12 WHEELS have a single bearing No. 57, on the inside tower plate; a No. 16 has two bearings.

Remove the clutch assembly from the crate and make sure the countershaft is free from dirt, grit, sand, or dirty grease. For a No. 5 or No. 12 WHEEL, slide the clutch assembly, keyways first, through the tower bearing from the outside, so that the keyway end extends out between the towers. For a No. 16 WHEEL, remove the No. 133 Set Collar and No. 16-47S Spacer, slide the clutch assembly, keyways first, through the outer bearing, and slip the set collar back on the countershaft. See Picture No. 31. Slide the clutch assembly on through the inner bearing, and put the No. 16-47S Spacer over the end of the countershaft against the tower bearing.

Slip the No. 36-XX Fiber Pinion on the countershaft and install the two keys. Insert the keys with the "sled runners" first, matching the keyways milled into the countershaft. Keep the pinion flush with the end of the countershaft. See Picture No. 32. With the keys in place, fasten the No. 47B bevel edge washer to the end of the countershaft with the No. 47C capscrew. Slide the countershaft outward until the pinion butts against the bearing, in the case of the No. 5 or No. 12 models, or the spacing sleeve on the No. 16 WHEEL. Then slide the set collar (inside the tower on the countershaft) up against the bearing that is next to the pinion. The set collar and the No. 47C capscrew lock the countershaft so that it cannot move in toward the WHEEL, or out. This is necessary to keep the pinion properly lined up with the gear fastened to the drive sheave.



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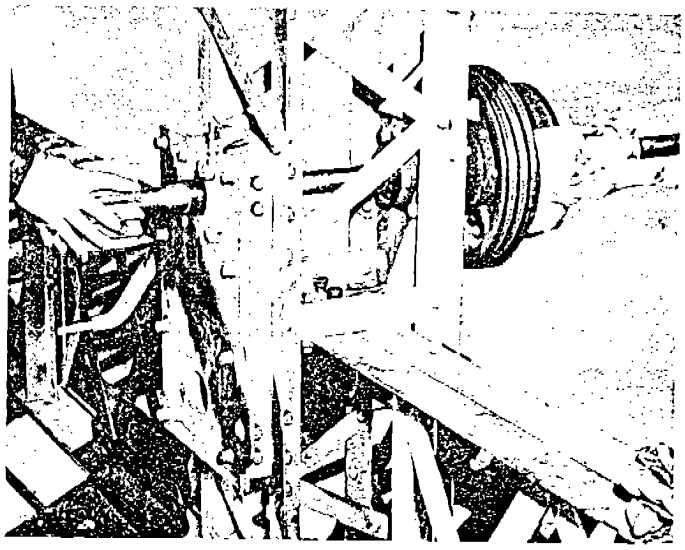

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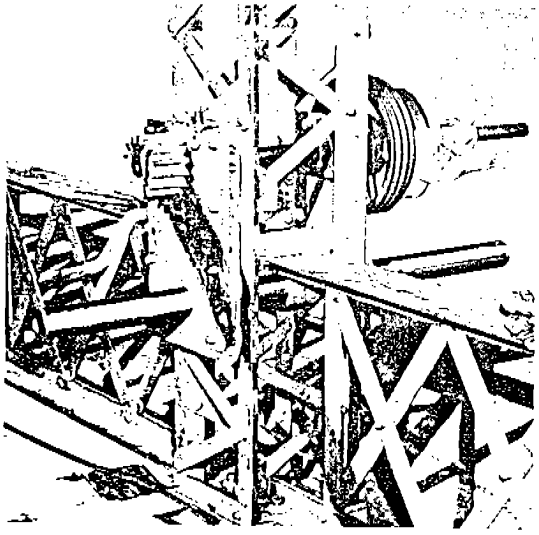

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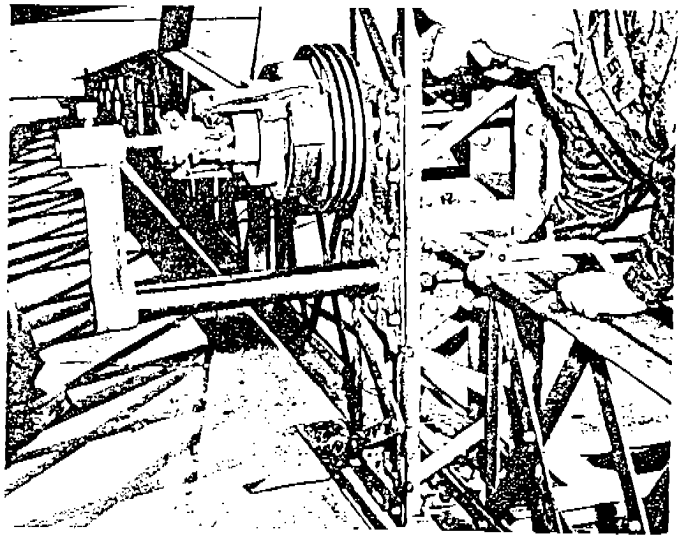

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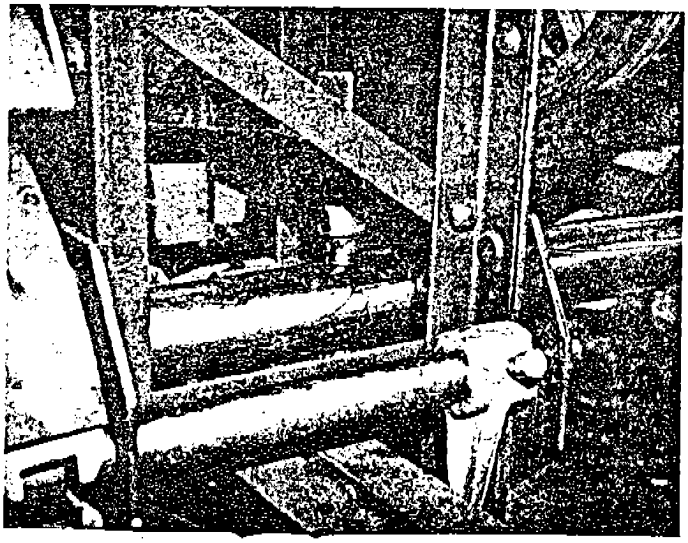

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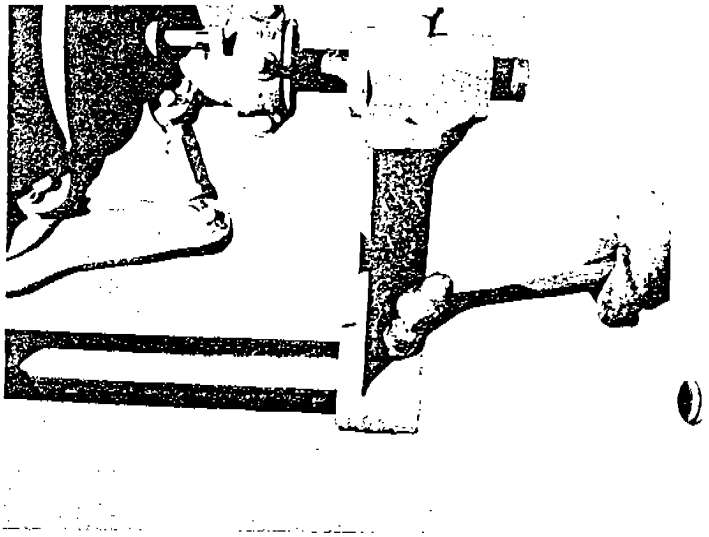


No. 36

Next, assemble the sheave axle to the gear tower, as shown in Picture No. 33. The sheave axle has a hole through each end and one in the middle. Insert the sheave axle in the bottom set of holes in the tower plates. This axle is completely interchangeable, top and bottom, and end for end. It is recommended that it be used in one position for a week, turned over and operated in that position for a week, turned end for end and operated there for a week, and finally turned over for another week. In this way, wear will develop uniformly over the whole shaft so that it can be used interchangeably to achieve maximum service life. This kind of rotation is easy to accomplish on portable rides, but is perhaps not as practical for a fixed location. In a park, it would be advisable to change the position of the sheave axle once or twice a season.

With the sheave axle in the tower, anchor it in position with the No. 96 sheave axle double head center pin. On the No. 16 WHEEL the pin goes through the center of the sheave axle. See Picture No. 34. On the No. 5 and No. 12 WHEELS the pin goes through the sheave axle and into the plate beneath it. See Picture No. 35. This pin keeps the sheave axle from revolving or sliding one way or the other.

Hang the three V-belts (or five, in the case of the No. 16) loosely around the sheave on the clutch. Then slide the No. 46 standjack on the outer end of the countershaft, and after that on the sheave axle. Anchor the standjack to the sheave axle with a No. 95 sheave axle end pin, as shown in Picture No. 36. Notice that this pin does not go all the way through the sheave axle. The countershaft turns freely in the babbitted bearing in the top of the standjack. Next, add the No. 52 standjack brace. Pin the end with two holes to the lug at the top of the standjack, using a No. 70 frame pin, (Picture No. 37), and fasten the other end to the base in front of the gear tower, using a No. 117 shoulder bolt and nut. However, a No. 116-B bent toggle, which is an "L" shaped flat bar, must be fitted on the shoulder before the bolt goes through the standjack brace and into the base. The bend in this piece must be toward the front of the WHEEL.

The No. 116-L clutch lever is the next to go on. See Picture No. 38. This is the piece with the fork on one end. The fork is held together by one rivet and one bolt. The small bolt extends up from the bottom through a slotted hole. The bolt head is elongated. DO NOT TAKE THIS BOLT OUT. Loosen the nut and turn the bolt one-quarter turn, so that the head will come through and permit the forks to be expanded enough to go over the pins of the No. 85 slide collar yoke on the clutch. The clutch lever lies across the top of the standjack brace. Squeeze the forks together, turn the bolt one-quarter turn, and screw down the wing nut securely to hold the forks together. Then connect the clutch lever to the standjack brace with a No. 211 combination clutch lever special bolt.

Do not assemble the clutch operating mechanism any further than this until after the top towers have been raised, and the spokes and rims have been installed. The clutch can still be operated at this stage by pulling the No. 116-L clutch lever toward the base. This will engage the clutch, and pushing the lever away from the base will disengage the clutch.

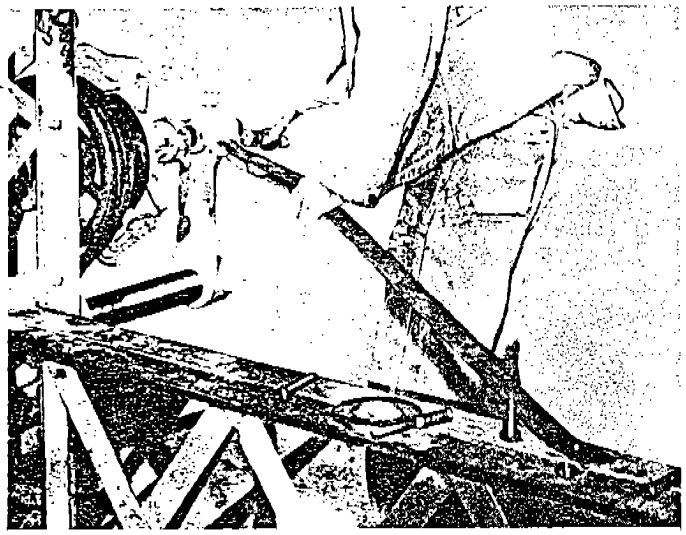
Moving now to the inner ends of the countershaft and sheave axle, assemble the two No. A-54X brake shoes, using the No. 54-XS spring with the head of the No. 1055X brake expander bar inside. See Picture No. 39. There are two plates on the front side of the gear tower for the brake expander bar to slip through. After the bar has passed through the tower plate next to the rotating WHEEL, slip on the No. 56 malleable lever for the brake bar and pin it with a No. 97 brake bar pin as shown in Picture No. 40. Slide the brake bar on through the outer tower plate, and as you do, guide the hinge ends of the brake shoes onto the No. 107-108X brake support finger (see Picture No. 41).

When the brake shoes and brake bar are back against the tower as far as they will go, then the next part to install is the No. 35 drive sheave, as shown in Picture No. 42. Guide the drive sheave on the sheave axle after first making sure that the sheave axle and the bore of the drive sheave are clean and coated with clean grease. Push the drive sheave all the way against the tower until the brake shoes are all the way inside the gear attached to the back side of the drive sheave. Then adjust the set screw on the No. 107-108X brake finger up or down until the brake shoes are riding clear of the brake surface inside the gear when the brake is off. See Picture No. 43. Connect the No. 53-A brake rod to the brake bar lever. Pulling on the brake rod rotates the brake bar lever, which in turn rotates the head of the brake expander bar, which then applies force to the brake shoes.

With the drive sheave seated all the way, slip the large No. 94 sheave axle washer over the end of the hollow sheave axle and secure it with the No. 95 sheave axle end pin, which has a flat on one side of the pin head. This holds the drive sheave in position. This No. 95 sheave axle end pin is identical to the one that pins the No. 46 standjack to the outer end of the sheave axle. These two pins should be exchanged prequently for extending the wearing life of both pins.

The drive sheave revolves freely on the sheave axle, and it has a No. 34 winding spool mounted on it. While the spool can be taken off after the WHEEL is assembled it will not be in the way and can be left on at all times. The reason for assembling the clutch and gearing at this point is so that the winding spool can be used to pull up the towers and spokes.

Next, put on the No. 113 gear guard, as shown in Picture No. 44. This is a malleable casting. There is a No. 131 gear guard hook bolt mounted on the inside plate of the gear tower. Remove the wing nut and lock washer. Drop the gear guard down so the flange fits over the tower plate with the bolt through the hole at the top of the gear guard. Then put on the lock washer, and screw the wing nut down tightly. The gear guard is easily put in place or taken off. It is a safety device to keep everyone and everything away from the meshing gears and should always be used.



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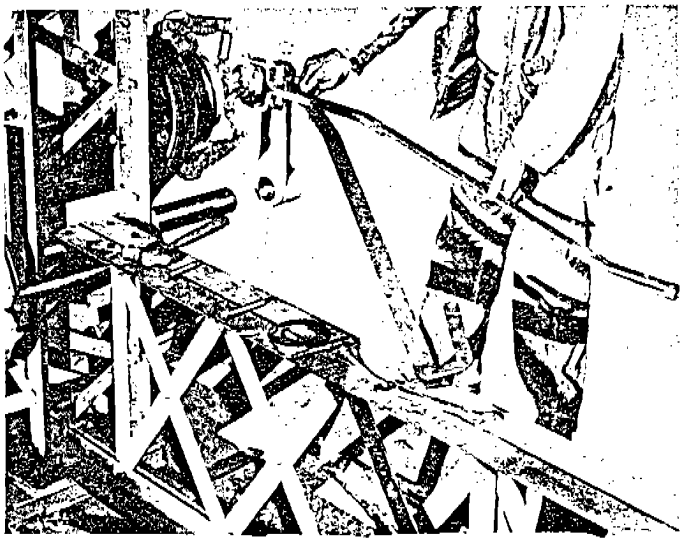

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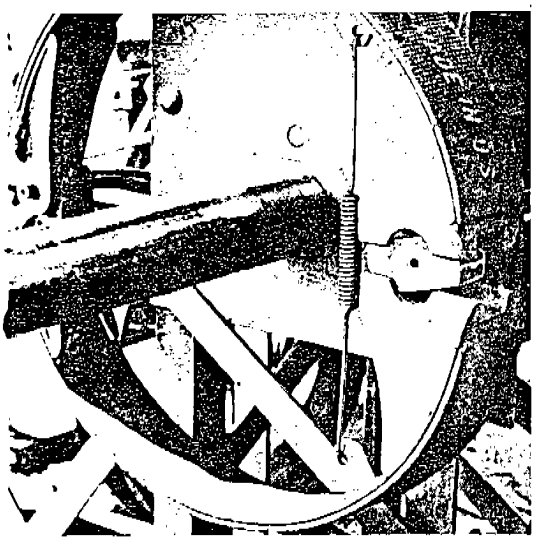

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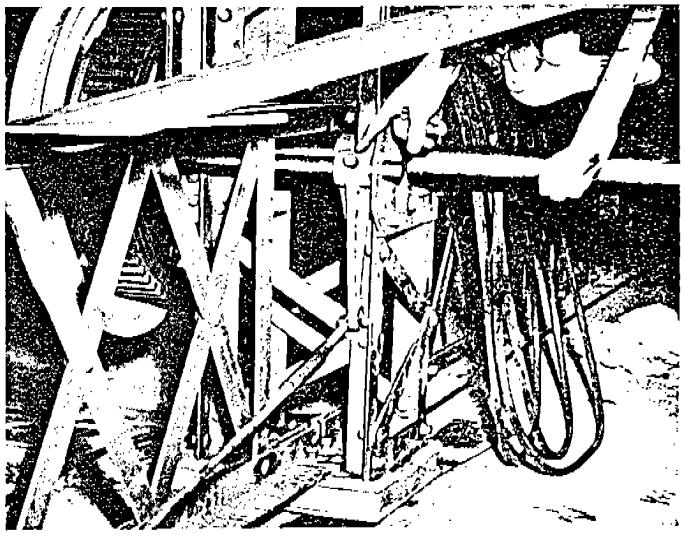

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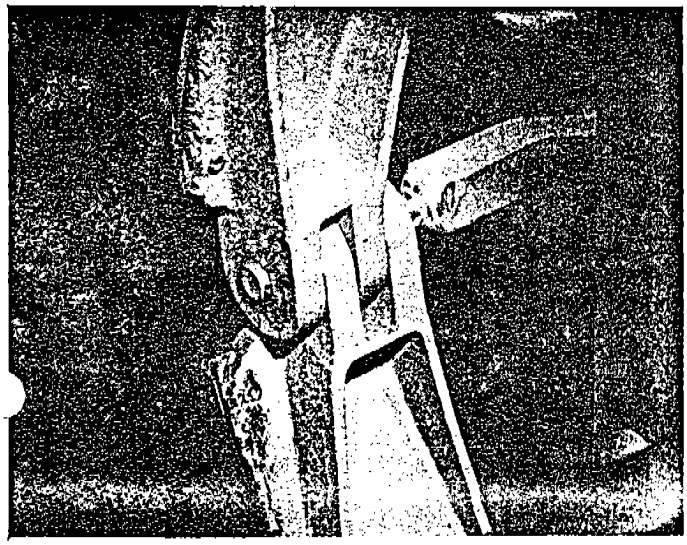

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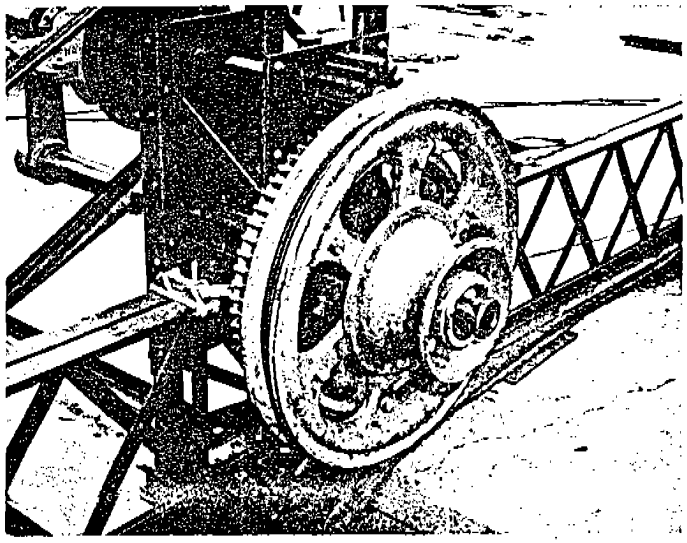

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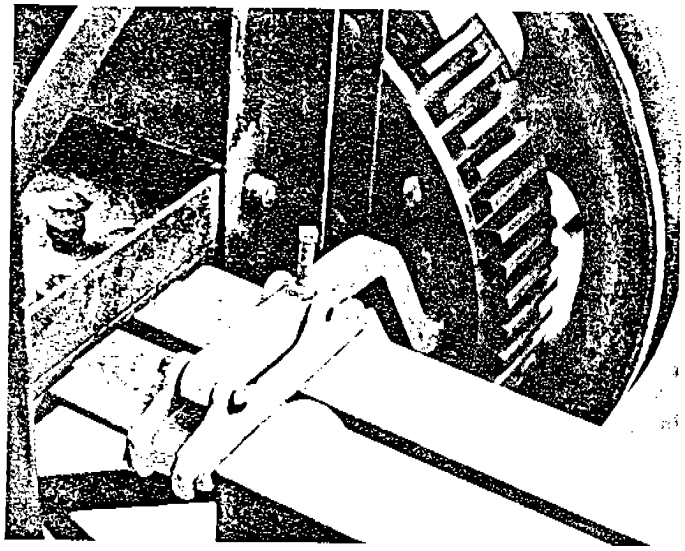

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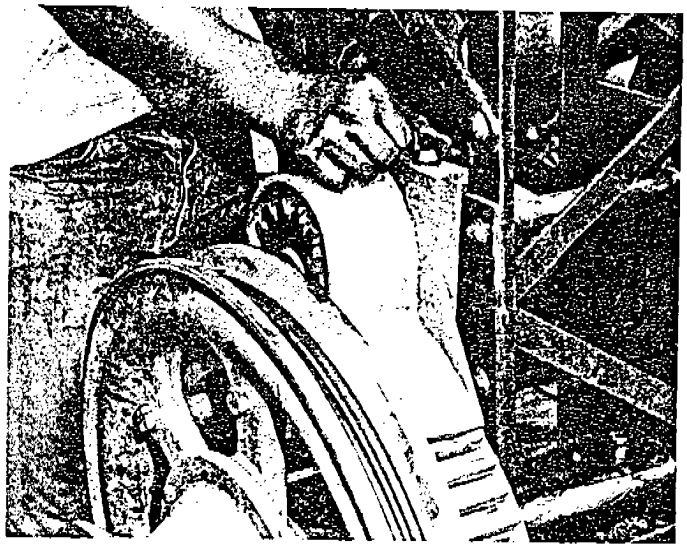

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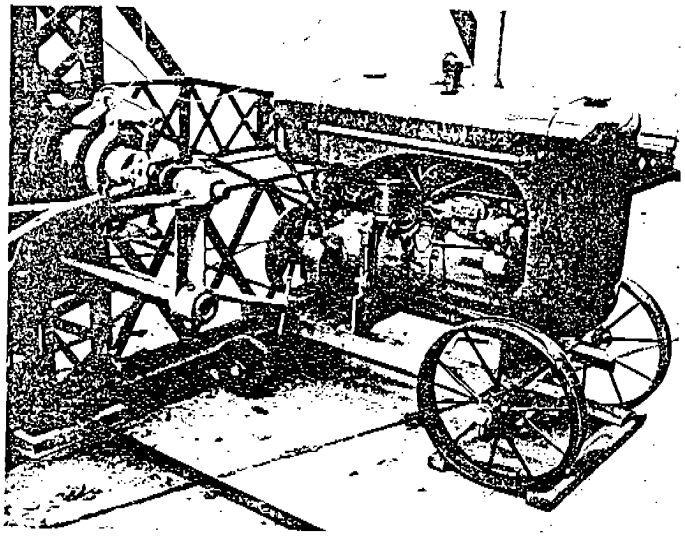

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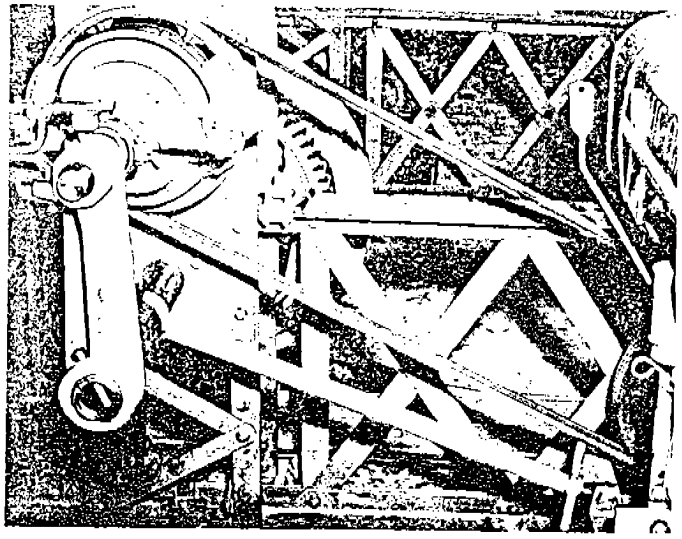

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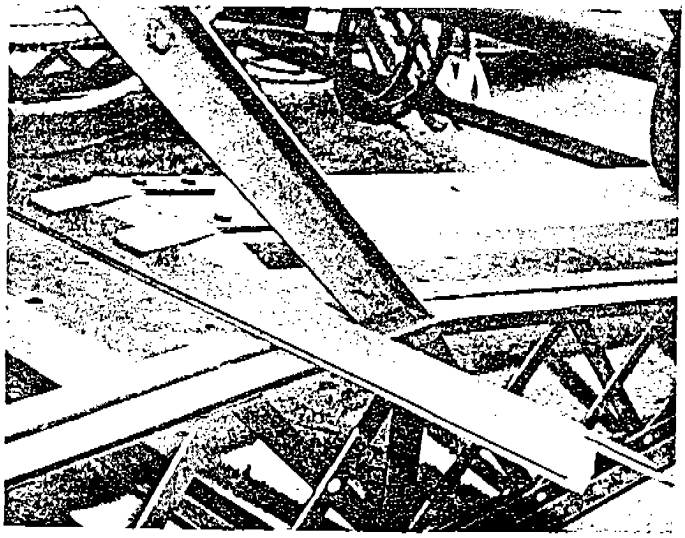

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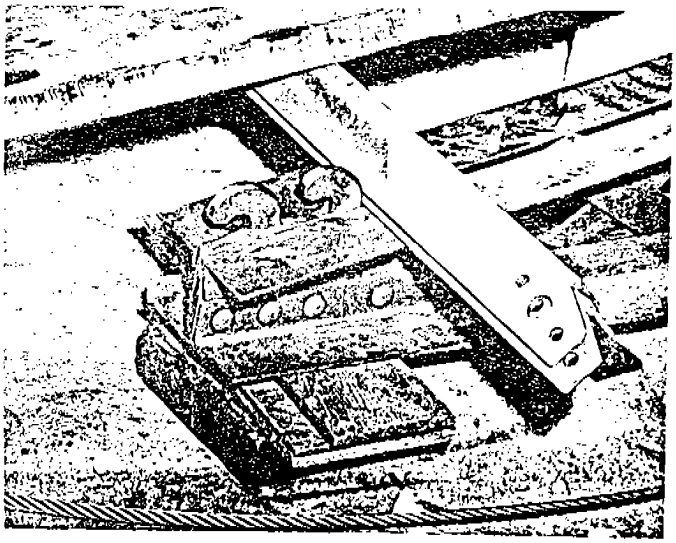


No. 48

If your BIG ELI WHEEL is powered with an electric motor, fasten the motor base to the pier and tighten the V-belts by adjusting the position of the motor with the adjusting screws in the motor base.

If your WHEEL is powered by a gasoline engine, bring your power unit into position to the rear of the clutch, with the sheave on the end of the power unit lined up with the sheave on the countershaft, and far enough to the rear to take up the slack in the V-belts. Be sure that the sheaves are in line and that the belts run true without binding on the sides of the V-grooves in either sheave. See Picture No. 45. Then install the No. 111-112V jackscrew assembly for tightening the belts, as shown in Picture No. 46. There is a small angle with a square hole in it on the side of the engine truck in which the screw end of the jack fits. The yoke end fits over the sheave axle on the WHEEL. By using the jackscrew handle you can readily adjust the position of the engine and truck, keeping the belts just snug. If you continue tightening the belts beyond what is necessary to drive the WHEEL, the countershaft will flex out of line and this will wear out the babbitted bearings in a short time. Do not tighten the belts any more than just enough to drive the WHEEL. After the engine is in position turn the front wheels all the way around so that the tongue will be under the engine and not in the way.

The top of the clutch must turn toward the operator when he is at the control lever. With the engine in position and with the V-belts connected, start the engine and observe the operation of the clutch and brake until you understand the operation thoroughly.

The clutch and brake surfaces should always be kept clean. Do not let dirt, gum, or grease accumulate. Keep the surfaces polished if you want to get the most clutching and braking action. Dirt, gum, or grease will decrease your clutching and braking power and might cause the clutch or brake shoes to jump and shimmy. The clutch and brake are simple in design but ruggedly built, and will give very effective clutching and braking power with smooth action and long life, with a minimum of adjustment, provided they are given reasonable care.

Proper lubrication of the bearings is very important. When first starting to turn the clutch and drive sheave under power, do not run more than a few moments before stopping and forcing more grease into the drive sheave bearing by turning down the cap of the grease fitting in the drive sheave. Also, keep an oil can handy for oiling the oil cup in the No. 85 yoke on the clutch slide collar. The bearing inside the V-belt sheave hub is an oil-less bushing which never needs oiling or greasing.

DIRECTIONS FOR ERECTING THE TOP TOWERS, AXLE, HUBS, AND WIND BRACES

With the bases and stub towers positioned, and the drive connected, the next step is to raise the top towers, axle, hubs, and wind braces. The procedures used with all three models of BIG ELI WHEELS are quite similar, although the erecting equipment in some instances is quite different.

Doubletree

Each base has two hooks sticking out of the top on the small end. The doubletree has links on each end, and one end of the doubletree has some extra links on it. This end goes on the gear tower side. The doubletree extends across between the bases at the rear of the WHEEL and engages the hooks closest to the towers. When setting up the WHEEL, some prefer to use the other hooks. Either set of hooks will work for set up, but regardless of which set you use, it is important that you secure the links of the doubletree so that they cannot jump off the hooks. Some fill the gap between the hooks with a bar or piece of wood tied down to the base. Perhaps the most satisfactory method is to slip a seat pin in between the hooks and run the nut on. There have been instances where the doubletree has jumped these hooks during erection when slack happened to occur in the block and tackle, so be sure that the doubletree is securely fastened to the base hooks.

At this point the drive cable should still be on the ground and should be underneath the doubletree.

Top Towers, Axle, Hubs, and Rings

With the bases, stub towers, and gearing all completed the next step is to put up the top towers. First, position the two runboards. To do this you must first lay four rim angles across the tops of the two bases on the front side of the WHEEL. Two of the rim angles go in behind the bottom corner of the front kneebraces as in Picture No. 47, and the other two lie just behind the hooks sticking up out of the two bases as in Picture No. 48. The open sides of the rim angles should be down and the short legs of the angles should be to the rear. When you place the two rim angles in behind the kneebraces pull one rim angle out to one side and the other out the other way, and be sure that each angle extends completely across the tops of both bases. You will need these rim angles sticking out later on. The two rim angles behind the base hooks do not need to extend out beyond each base.

Each 2 x 10 runboard has two steel bars fastened to one end. Lay these bars over the rim angles behind the kneebraces and let the runboard rest on both sets of rim angles. On the No. 16 WHEEL you will need to supply additional ramping to bring the ramp all the way to the ground, as shown in Picture No. 49. No additional ramping is required on the No. 5 and No. 12 models. Next, on the No. 16 you must block up under the runboards (not on the No. 5 or No. 12). The runboards are not strong enough to carry the No. 16 load without sagging excessively. If it sags the tower pin holes will not line up. It is recommended that

you block solidly under each runboard in two places between the two sets of rim angles on the No. 16 WHEEL.

Next, bring out the two top towers and lay one beside each base. The larger 7/8" holes in the tower hinge plates must be to your left as you stand in front and face the WHEEL. Also, each top tower has a plate with two holes in it on one side at the top. This plate is used to pin the windbrace to the top of the tower, and so this plate MUST be to the outside. The dolly wheels must be underneath the towers.

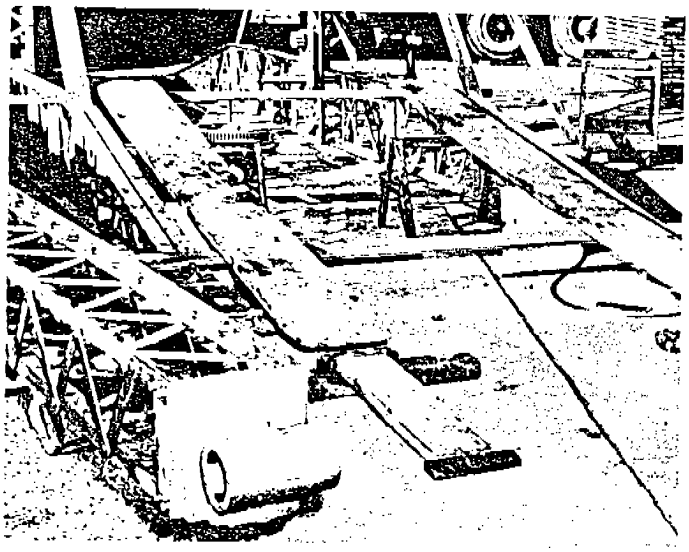
Assemble the hubs to the main axle next. There is no right or left hand to the main axle. Both hubs are the same. However, if only one hub is fitted with electric rings, then this hub is to go on the side closest to your electrical supply. Before sliding the hubs on the axle, a hub ring, which is the spring-loaded ring that holds the hub pins in the hub, should be on each hub. On a No. 16 hub ring there are four holes counterbored on one side only (there are three such holes on No. 5 and No. 12 hub rings). See Picture No. 50. With the ring fastened to the hub, the counterbore allows the ring to spring up around the head of each hub bolt, which locks the hub ring in position and prevents it from coming off.

Wipe out the insides of the hubs and clean off the main axle. Coat the mating surfaces with clean grease, and then slip the hubs on the axle, making sure that the hub rings on both hubs face toward each other. After the hub is started on you can get it to go the rest of the way much easier if you will rotate the hub slightly as you push. A pin on the axle keys the hub to the axle when the hub is all the way on. Tighten the set screws in the hubs to lock the hubs securely to the main axle.

You should never have to remove the electric rings except to replace them when they are worn out, but be sure that they are on before you insert the main axle in the top tower bearings. Clean out the top tower bearing on each tower as shown in Picture No. 51, coat it with clean grease, and then slip the tower bearing on the end of the axle. See Picture No. 52. To do this, the hinge end of the tower should be picked up, raised to clear the base, and walked toward the WHEEL until the dolly wheels on the tower can rest on top of the base. Then bring the other tower into position on the axle and on the base.

With the tower bearings all the way on the axle, then slip the set collars on the axle and tighten the set screws. See Picture No. 53. Be sure that the set screws fit in the recess in the axle. This prevents the bearing boxes from sliding off the main axle.

Then roll the towers and axle back until the dolly wheels are up against the lower ends of the kneebraces. Block the hubs to keep them from rolling. The flanges on the dolly wheels fit over both edges of the kneebraces and keep the tower from sliding off one way or the other. See Picture No. 54. Most



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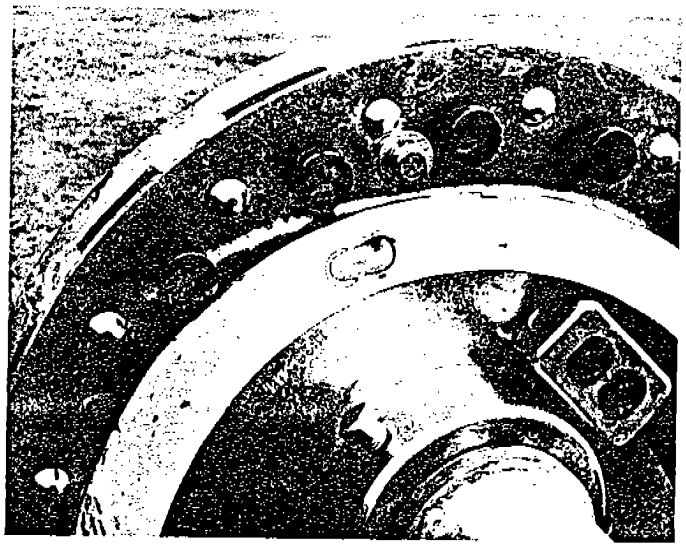

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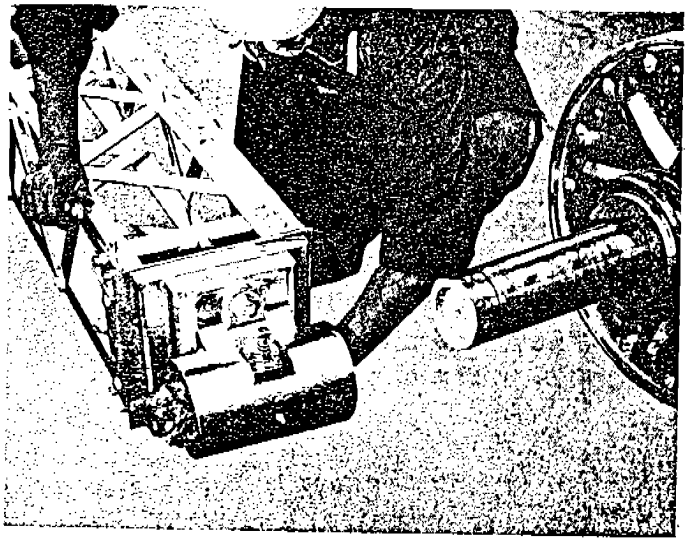

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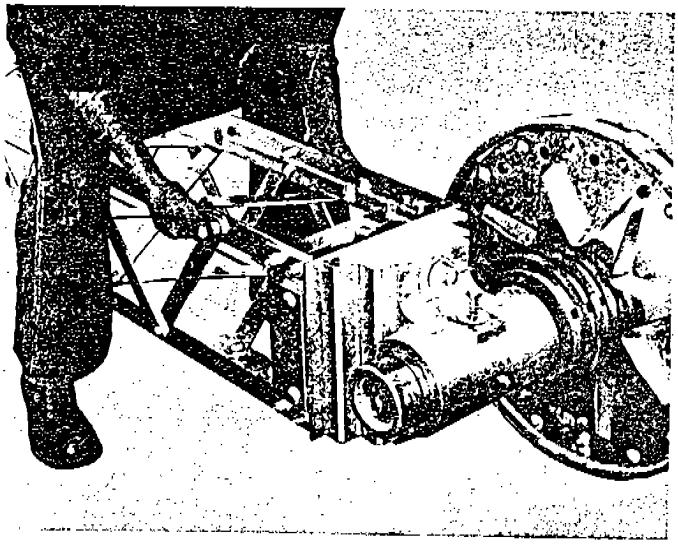

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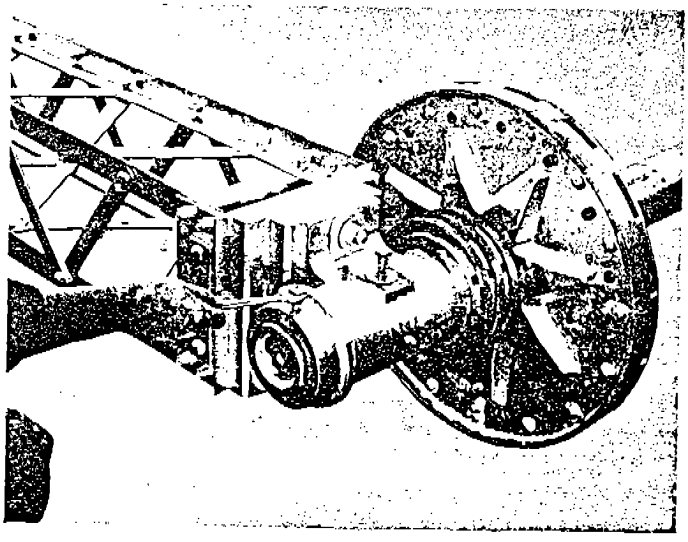

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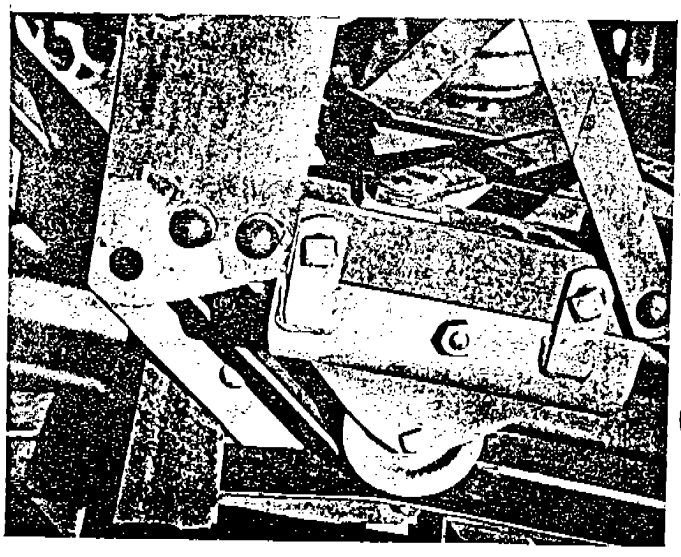

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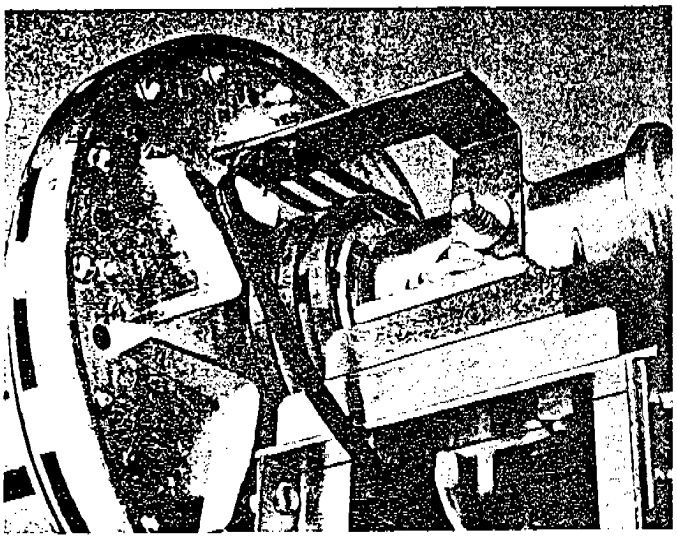

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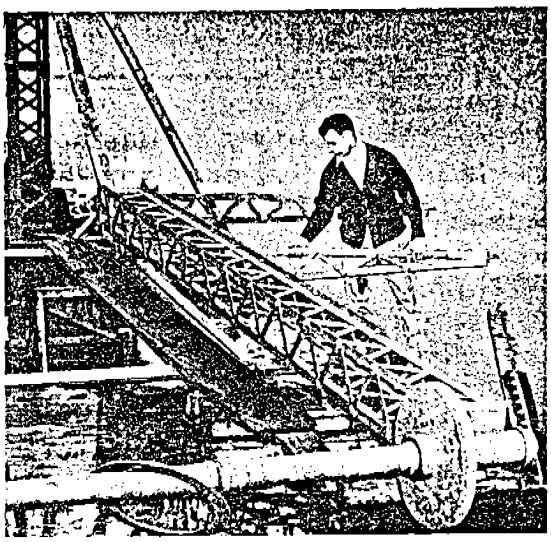

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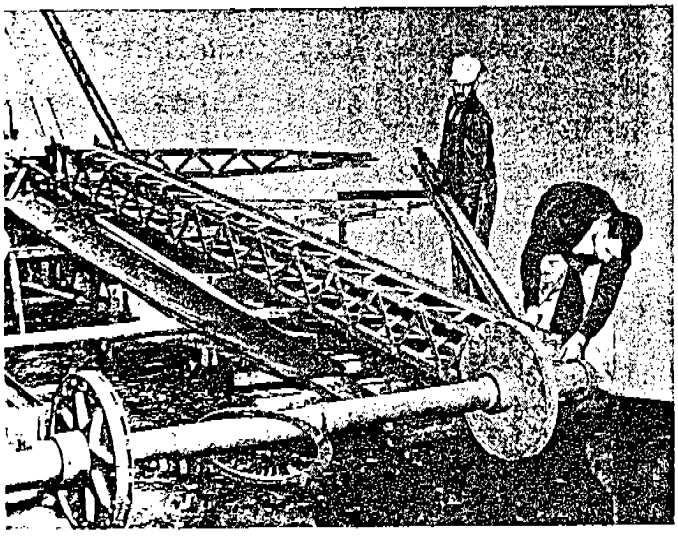

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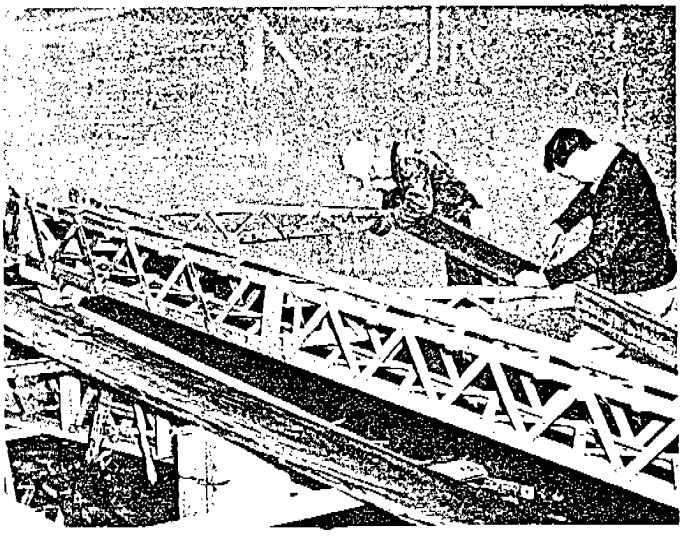

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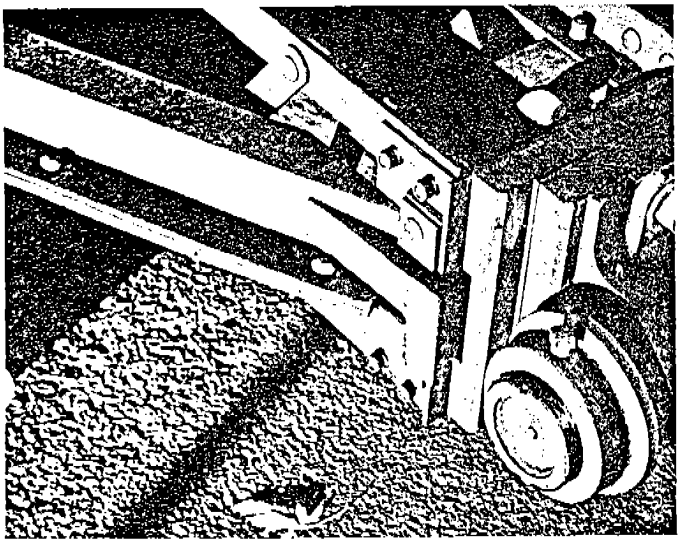

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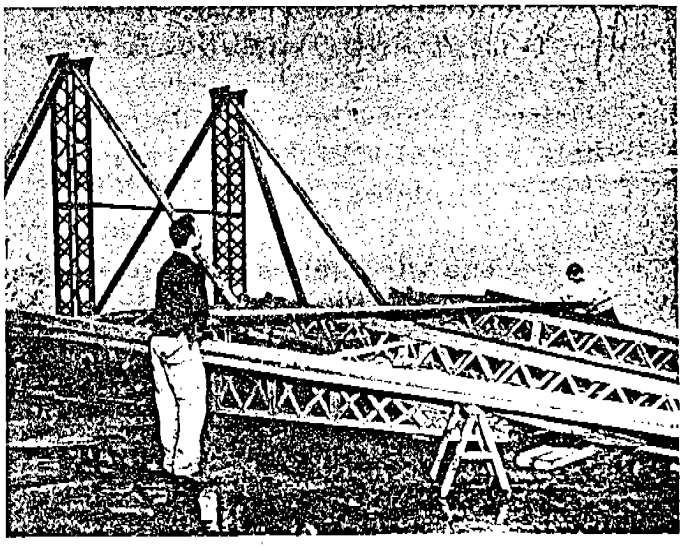


No. 60

operators never remove the dollies. The dollies are designed so that when you roll the towers to the top of the kneebraces, the hinge holes will line up. If the runboards are not supported properly to keep them from sagging the holes will not line up. As the tower dollies are rolled up the kneebraces, the hubs act as wheels for the other end, and they roll on the runboards. Do not try to do this until all of the tower erecting equipment is in position.

At this time you should install the electric brushes on the tower bearings. See Picture No. 55. They can hardly be put on wrong. The slotted piece of steel with two small pins in it slips under the washer with the spring behind it until the two pins enter the small holes in the No. 10 bearing at the top of the tower. This fastens the brush assembly thoroughly and in the proper position for the brushes to contact the rings on the hubs. The brushes fit on either tower, depending on which side of the WHEEL is closest to your source of electricity and on which side you have mounted the electric rings. If you have rings on both hubs, then of course you will need to install two sets of electric brushes.

A-Braces and Windbraces

With the towers in position ready to roll up the kneebraces, install next the A-braces.

On the No. 16 model:

> There are three different sizes of these tapered pieces that look something like the letter "A". At this point only the No. 11-T top (short) and the No. 11-M (medium) A-braces are to be installed. See Picture No. 56. The A-brace is constructed of two braced angles. When the wide end is inserted in the tower, the vertical legs of the two angles should be toward the tower hinge. These angle legs are notched and slotted so that the middle A-brace fits down over the top of the two tower hinge plates, and the top A-brace fits down on the two plates that are riveted on the tower about one-third of the distance from the hinge to the main axle. There are no pins to hold the A-braces to the towers; they hold their positions in the towers by their own weight when the towers are raised.

On the No. 5 and No. 12 models:

> There is only one size of A-brace on these two models of BIG ELI WHEELS. This A-brace fits down on top of the two tower hinge plates.

The windbraces are in two pieces: upper, No. 12-U, and lower, No. 13. Install only the upper windbraces next. This section is identified by the flat part with two holes in it which extends beyond the end of the windbrace proper. Hold

the windbrace parallel to the tower and away from the ends of the A-braces as shown in Picture No. 57, and guide this flat part at the top end of the windbrace up under the flat plate on the outside of the tower just below the main axle. Then swing the lower end of the windbrace back onto the ends of the two A-braces, align the pin holes, and drive in No. 70 frame pins. See Picture No. 58.

On the No. 16 WHEEL, before you try to pin the top end of the windbrace to the tower, block up under the outer end of the windbrace until it is lined up with both towers. Keep the blocking under the windbrace until you are ready to roll the towers up the kneebraces. Connect the top of the windbrace to the tower with two No. 68 double head base pins. Put the No. 71 pin lock, which is a slotted flat plate, over the heads of these two pins and behind the top rivet in the windbrace, as shown in Picture No. 59. This will prevent these pins from working out.

Next, assemble the A-braces and windbrace to the other side of the WHEEL and you are ready then to install the tower erecting equipment.

Tower Erecting Equipment

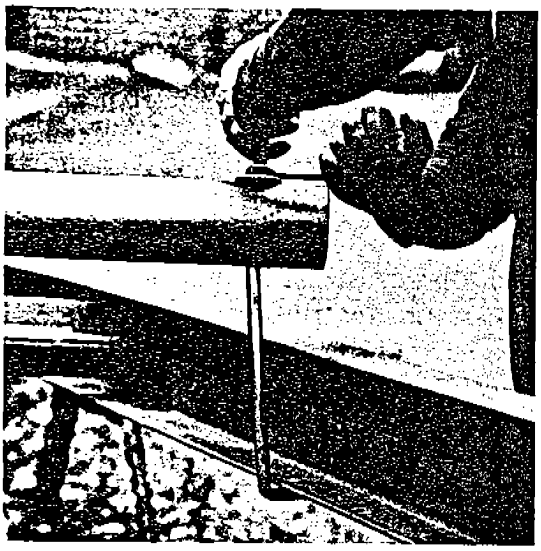
First, remove the hub ring from each hub. This is done by pushing the ring in so that it can be turned far enough to let the large part of the slot come over the head of the bolt. Then the ring will slip off easily. Bring the two hub rings together in the center of the main axle.

On the No. 16 model:

> Then as shown in Picture No. 60, lay the erecting beam, which is the 20 ft. long section of 3" round pipe, across the top of the two towers where they lie. The erecting beam has a hook bolt on each end. The eyebolt in the center should be on the side next to the main axle. Slide the erecting beam toward the main axle until each hook bolt hooks under the bottom side of the windbrace and the bolt butts against the back side of the windbrace. The erecting beam should be square with the towers, so be sure that each hook is the same distance from the end of each windbrace. Then tighten the hook bolts until the weight of the windbraces is carried by the erecting beam. See Picture No. 61. The beam will bow a little as you raise the windbraces until they are straight across from each other and the towers are lined up. If you do not do this, the towers will twist outward and the tower hinge pin holes will not line up. When the weight is carried by the erecting beam you can then remove the blocking under the windbraces if you wish.

On the No. 5 and No. 12 models:

> This erecting beam is not necessary because the structural members are much lighter than on the No. 16 WHEEL, and twisting of the towers is not the problem that it is on the larger WHEEL.



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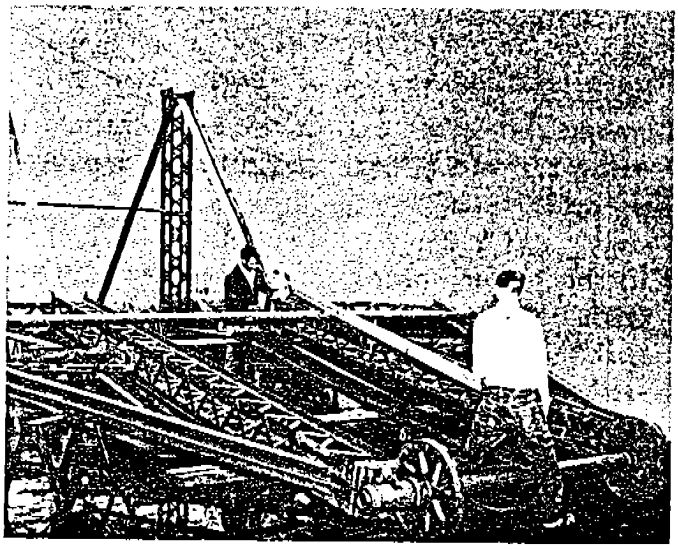

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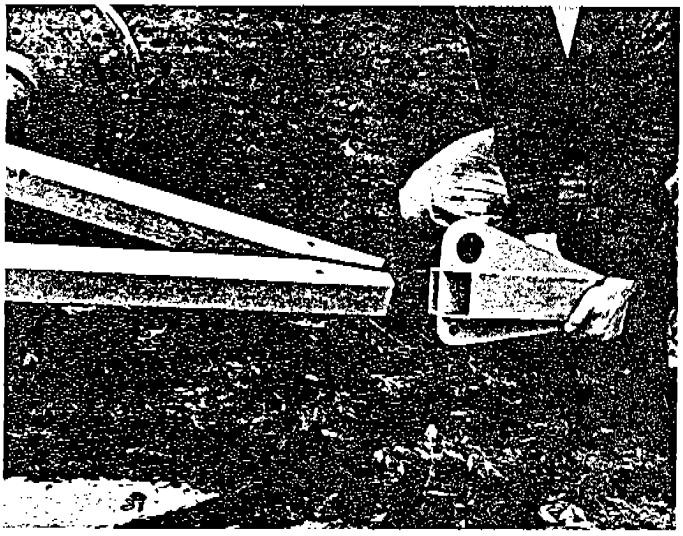

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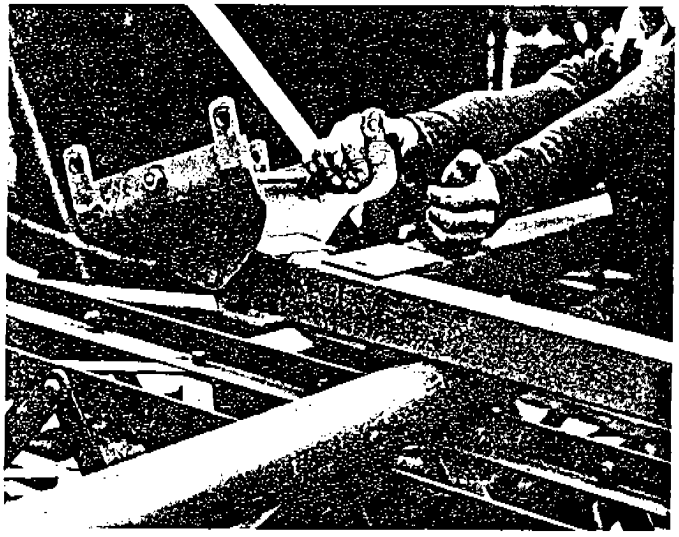

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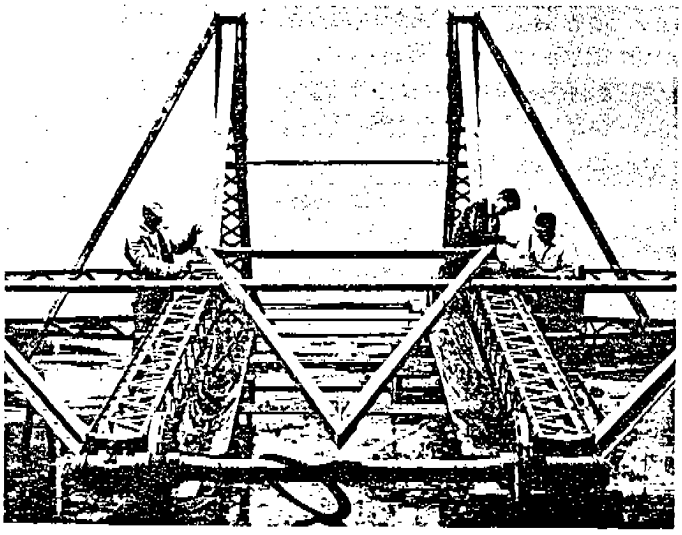

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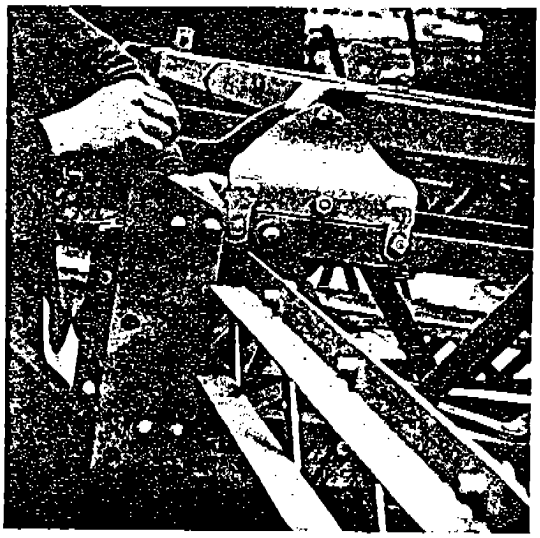


No. 66

Erecting Derrick

The erecting derrick on the No. 16 WHEEL is considerably different from the design used on the No. 5 and No. 12 WHEELS, and so it is necessary that they be considered separately.

On the No. 16 model:

The first part to assemble is the large A-frame, which consists of two long 3" square tubes, a square tube cross member, and a triangular cap. Lay the long tubes across the erecting beam and the main axle as in Picture No. 62, so that the lugs with the holes in them are sticking up, and the hinge ends are toward the tower hinges. Bring the tapered ends together and slip on the triangular cap. See Picture No. 63. The large plate in the middle of the cap has two holes in it. The side with the large hole should be on the top. Fasten the three parts together with the two bolts in the cap. The heads of the bolts should be on top and the nuts underneath.

Then install the cross member at the other end. This piece of square tubing has two angles welded on near the ends. These angles should be pointed up. The eye in the center should be away from the main axle. As shown in Picture No. 64, swing the hinge up out of the way to make it easier to slide the A-frame leg in between the plates on the end of the cross member. Otherwise, the hinge will hang up on the tower. Bolt this cross member to the two A-frame legs, but do not pull the bolts tight enough to squeeze the square tubes out of shape. A good snug fit is all that is necessary. Slide the whole A-frame up the erecting beam and bolt one of the hinges to the tower. See Picture Nos. 65 and 66. Notice that these hinge pieces are just like the dolly plates on the other sides of the towers, and they fasten to the towers in the same way. Move the point of the A-frame back and forth until the second hinge goes into place in the tower. Bolt it in place.

Next, assemble the small A-frame shown in Picture No. 67. It consists of two legs made of 2" square tubing, and a point connection. One end of the square tube has a bent plate welded to it. Position both legs so that the bent plates are spread apart and are parallel to each other. These pieces are interchangeable and can be used either on the right or on the left. Bolt the point connection to the legs as shown in Picture No. 68. Tighten these bolts also just for a snug fit.

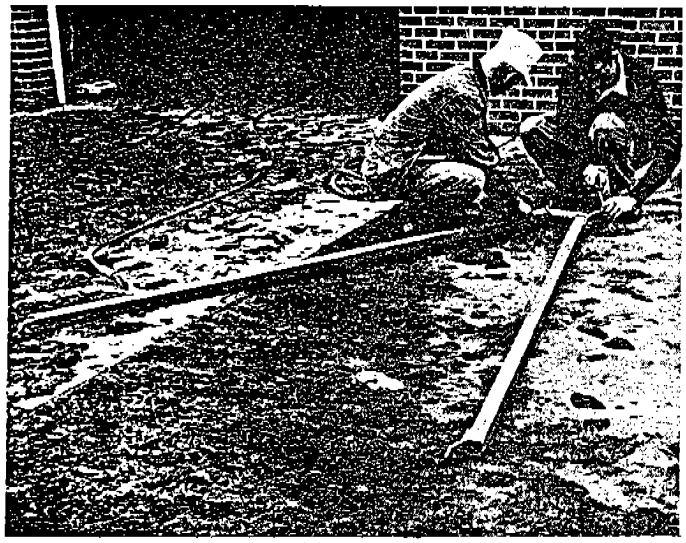
Then, lay the small A-frame across the top of the erecting beam and drop the bent plates down between the two angles welded to the large A-frame cross member. See Picture No. 69. Bolt the bent

plates to the angles with the heads of the 3/4" bolts on the outside and the nuts next to each other, as shown in Picture No. 70. The direction of the bolt will make no difference when you are setting up the WHEEL, but this can be important when you disassemble the WHEEL. Occasionally one of the ropes drops down along the side of the small A-frame, and this rope could spin off a nut if the nut were placed on the outside.

Finally, connect the cables that go from the point connection on the small A-frame to the lugs on the large A-frame legs. These are screwed clevis connections and you should be certain that as the small A-frame is raised the cable will be free and not be around one of the plates. This completes the fitting of the erecting derrick to the No. 16 WHEEL.

On the No. 5 and No. 12 models:

The first piece to assemble is the A-frame base, which consists of a section of 2" square tubing long enough to extend across both towers, and with fittings for attaching it to the towers and for the A-poles to be attached to it. Lay the A-frame base across the top sides of the towers right next to the top tower hinge plates, as shown in Picture No. 71. Secure it to each tower, as shown, with an "L" mounting pin. The A-frame base should be located so that the lugs with the bolts through them are on the side toward the main axle. Next, the two A-poles are to be added. On one end of the A-pole there is a flange sticking out of a side. This is to be passed under the bolt and between the lugs on the A-frame base. When both A-poles engage the bolts on the A-frame base, the other ends of the A-poles are brought together to a point. This locks the A-pole to the A-frame base so that it cannot jump off while the towers are being raised. See Picture No. 72. Next, slip the No. 215 (for the No. 5 WHEEL) or the No. 216 (for the No. 12 WHEEL) malleable derrick point lock over the ends of the A-poles where they come to a point. Secure them together with a No. 137-B derrick pin. See Picture No. 73. The erecting derrick should then appear as it does in Picture No. 74. This completes the fitting of the erecting derrick to the No. 5 or No. 12 WHEEL.



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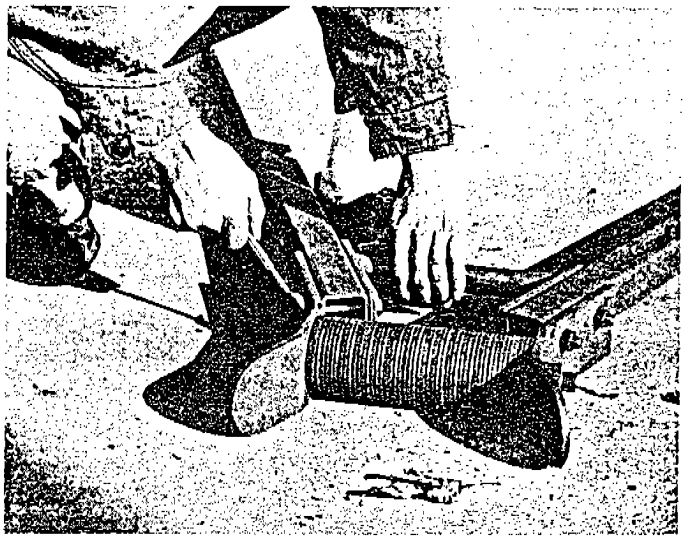

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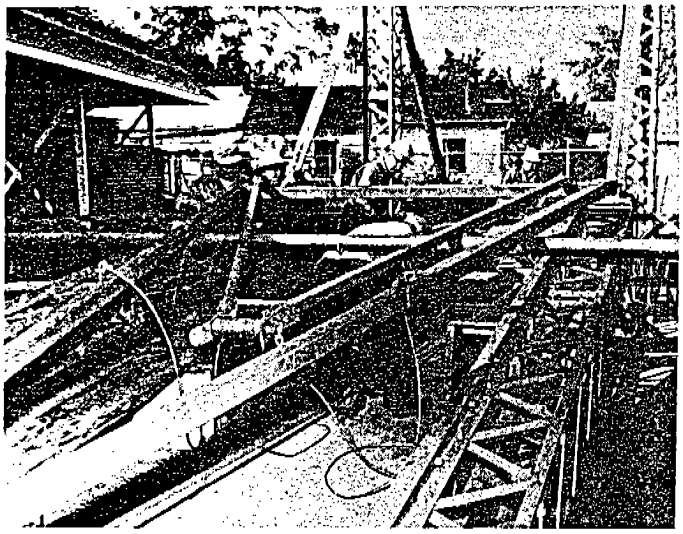

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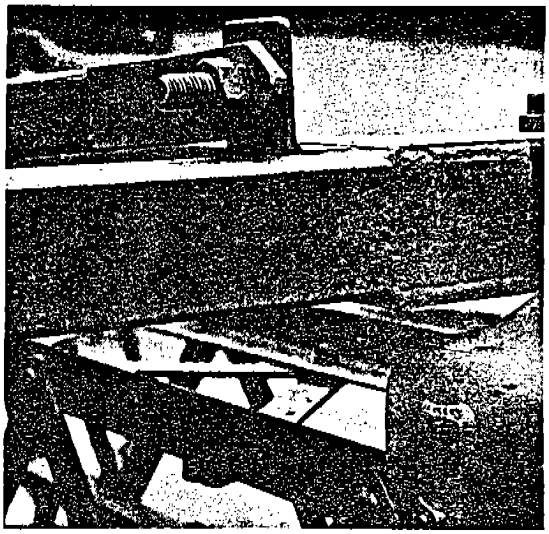

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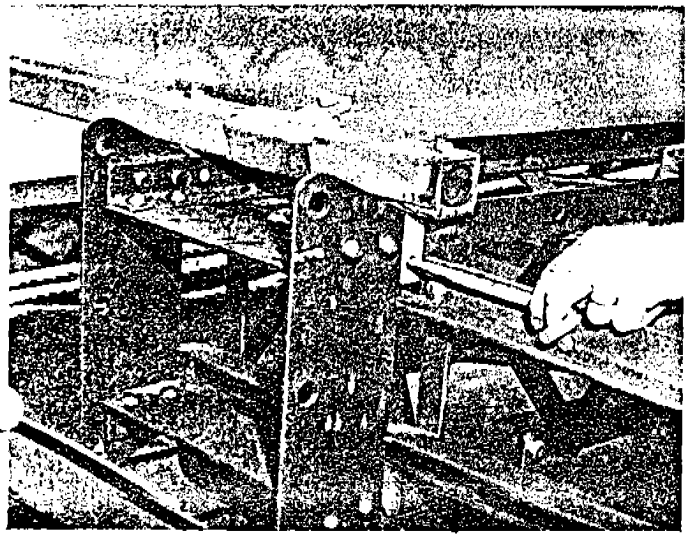

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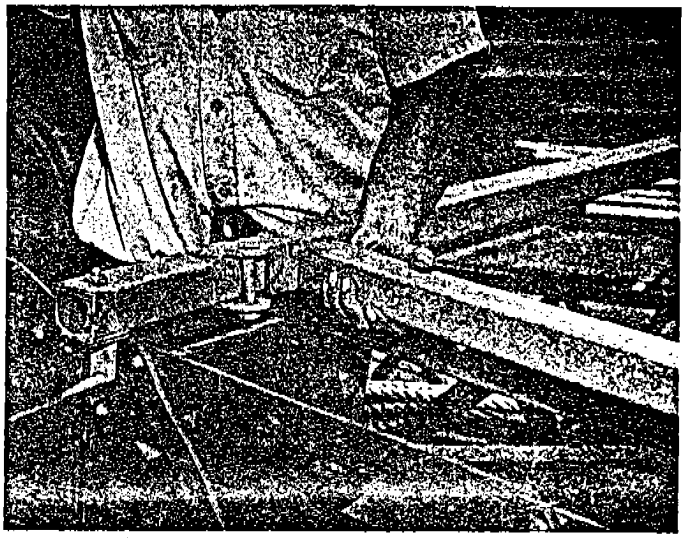

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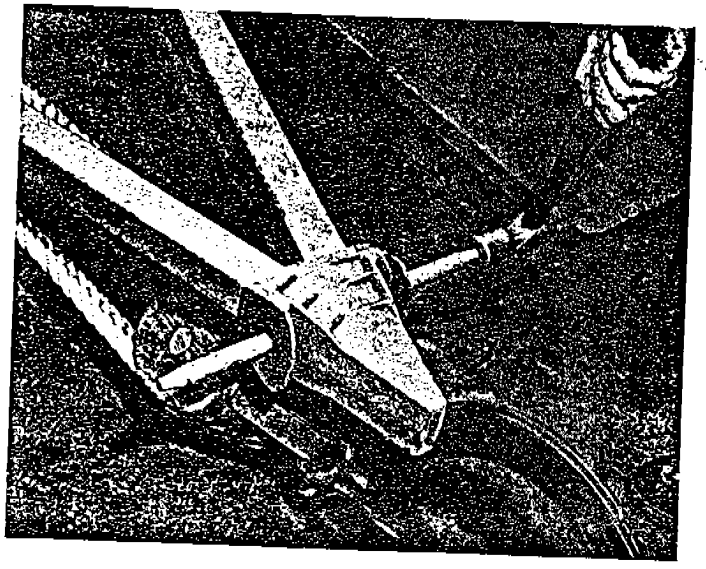

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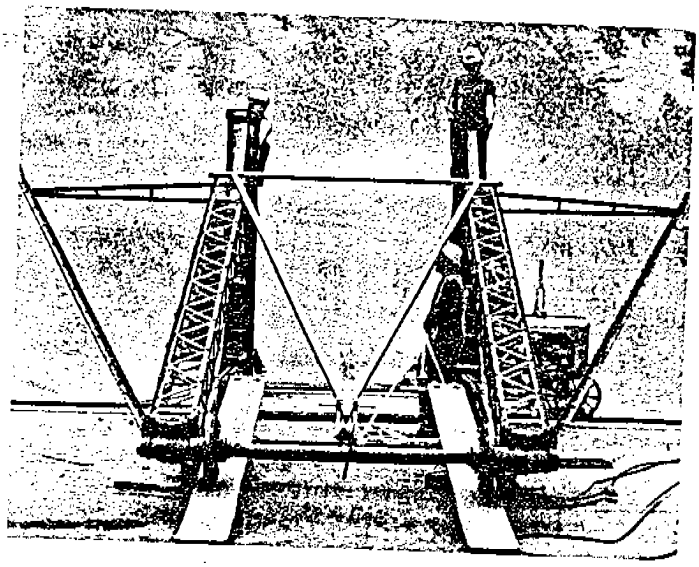

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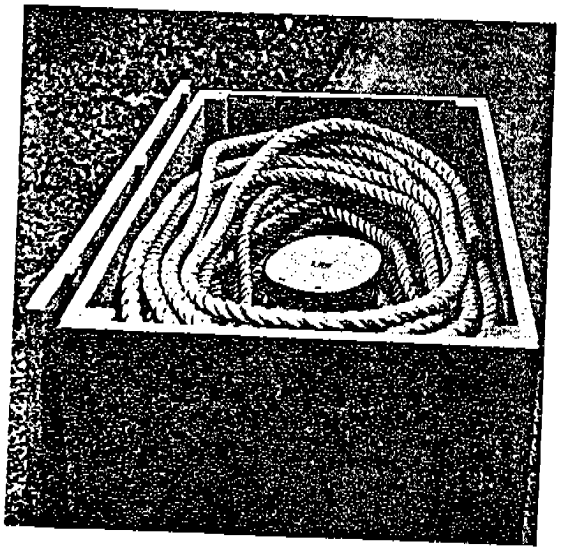

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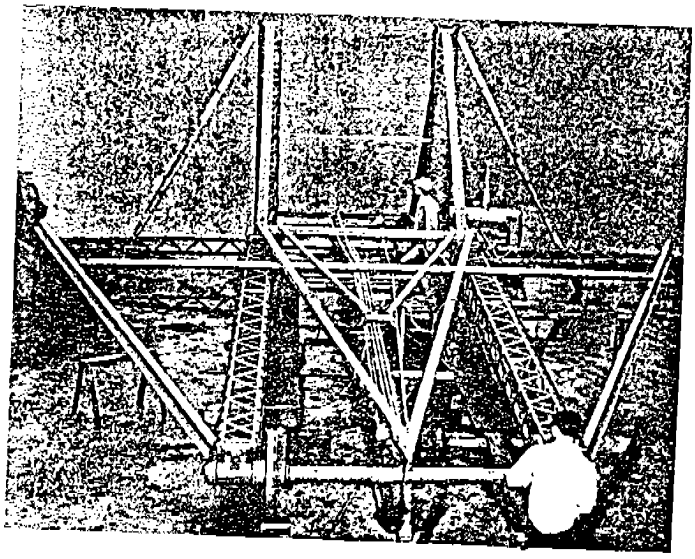

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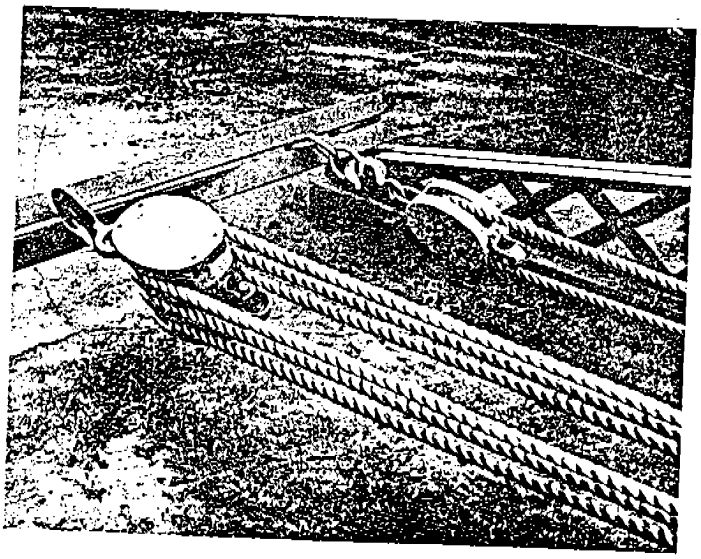

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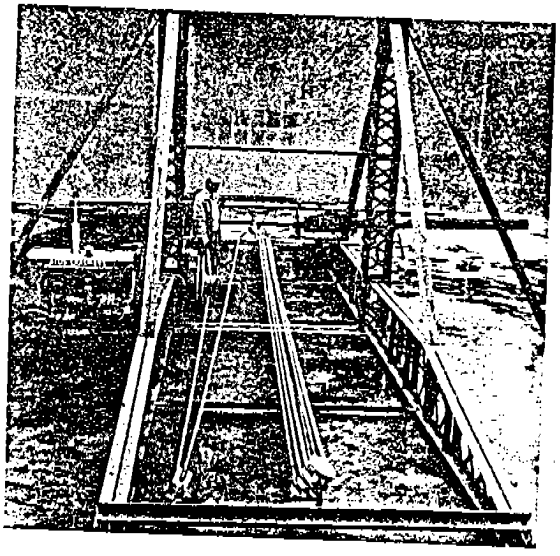


No. 78

Block and Tackle

All of the block and tackle needed for erecting the WHEEL is in the rope box shown in Picture No. 75. The spoke rope is a 7/8" diameter 3-strand Manila rope. It is used with a single block.

- On the No. 16 model it is 65 feet long.
- On the No. 12 model it is 55 feet long.
- On the No. 5 model it is 50 feet long.

The derrick rope is used to pull up the towers and is a 7/8" diameter 3-strand Manila rope on all three models, but is of differing lengths.

- On the No. 16 model it is 360 feet long.
- On the No. 12 model it is 195 feet long.
- On the No. 5 model it is 150 feet long.

The following rope blocks are used with each model of BIG ELI WHEEL:

- On the No. 16 model, two triple blocks and a single block.
- On the No. 12 model, one triple block, one double block, and one single block.
- On the No. 5 model, two double blocks and one single block.

The block and tackle used on the three models must be different from each other because of differences in size and weight of the parts that must be handled. Because of these differences, the block and tackle for each model of BIG ELI WHEEL is connected in a particular way.

When removed from the rope box, the ropes will be pulled up so that the large blocks are close to each other. The first thing to do is to feed the ropes through them until one can be hooked into the center of the doubletree at the rear of the WHEEL and the other one through the two hub rings which are together in the middle of the axle.

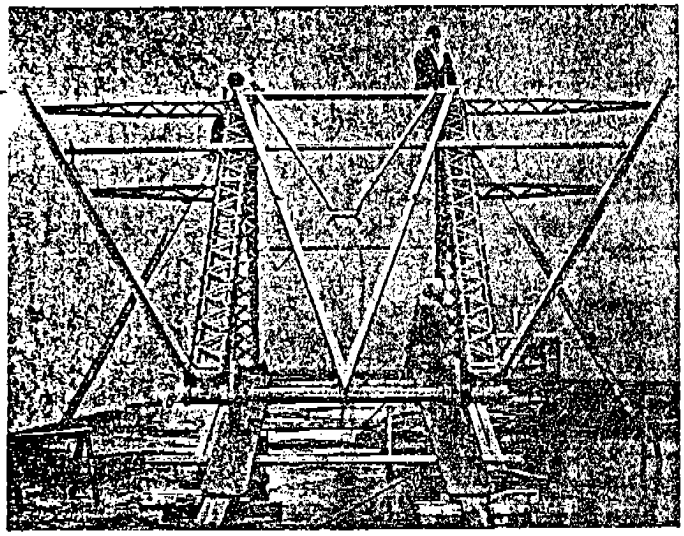
- On the No. 16 model, the rope is tied off on the triple block which hangs on the hub rings at the main axle.
- On the No. 12 model, the rope is tied off on the double block, which is then hooked into the doubletree at the rear of the WHEEL, and the triple block is hooked into the hub rings on the main axle.
- On the No. 5 model, the tope is tied off on the double block which hangs on the main axle.

The block hanging from the main axle should be positioned so that the pull rope comes off it on the gear tower side. Extend the ropes the length of the WHEEL, over the two sets of rim angles laid across between the two bases, and under all of the tower erecting equipment. See Picture No. 76. Hook the block into the doubletree with the hook pointing down. Then hook the single block into the other ring on the doubletree. See Picture No. 77. After the rope is passed through this single block it is then taken up to the winding spool. As you face the winding spool from between the towers the rope is wound around the spool in a counterclockwise direction. Hold the rope coming from the block in your left hand, and wind on the loops with your right hand, using the "free" length. The rope should feed on and off from the bottom of the spool with the "free", or pulling end of the rope, toward the center of the WHEEL and the tight part that goes back to the singletree, next to the tower. Winding spools differ in their ability to grip the rope, and it it not exactly clear why this is true. For the No. 5 and No. 12 WHEELS, two loops over the winding spool will usually be enough, but sometimes you might need three. For a No. 16 WHEEL, you will need three or four wraps on the spool. Use the same wrap for pulling spokes and towers; except that, two wraps will do for pulling No. 16 spokes. Pile the extra rope a few feet forward of the winding spool, so that as the rope comes off the spool the man working the spool can pile it all together. Picture No. 78 shows all of the block and tackle ready for pulling the towers up the kneebraces.

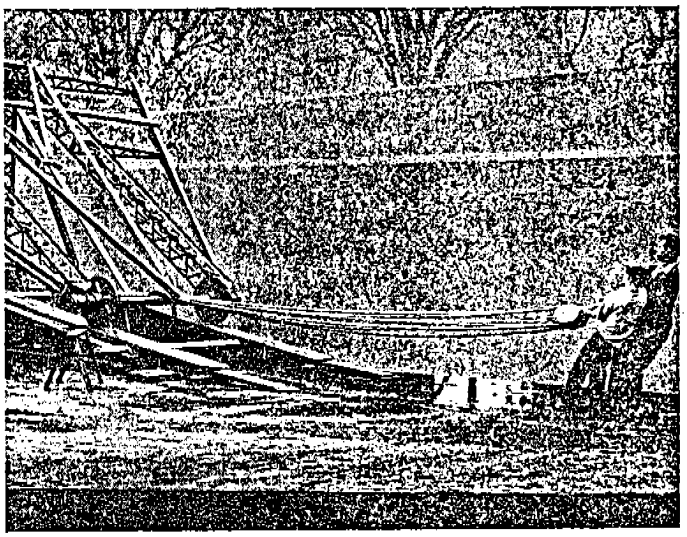
Raising the Towers

Start the engine at low speed and engage the clutch. A single wrap of the hoisting rope around the winding spool is enough to take the slack out of the ropes, but you may still need two wraps to pull the towers up the kneebraces. If you have never operated the winding spool before, try pulling the towers up the kneebraces about a foot and then easing off on the derrick rope until the towers slowly descend. You should practice using the winding spool until you are confident. Then when you have the feel of it, pull the towers all the way to the top of the kneebraces. The dollies attached to the top towers will ride up the kneebraces and the hubs will roll up the runboards. It is generally necessary to have a man at the top of each stub tower to guide the hinge plates of the top tower over the outsides of the stub tower hinge plates, by using the No. 75 hinge pin as a lever.

When the towers are at the top, hold them there with the winding spool and rope. One set of hinge pin holes should be lined up fairly well. Pull the holes in line with the No. 64 large drift pin if necessary, and then drive a No. 75 hinge pin in each tower, as shown in Picture No. 79. The pin should enter the side of the tower where the pin holes are the largest. The pin has two different diameters, and when it has been driven clear through the tower the pin will fit both sets of holes. Then drop a No. 75-A hinge pin key loosely into the slot in each tower hinge pin. Do not drive these keys in tight until after the towers are raised.



No. 79



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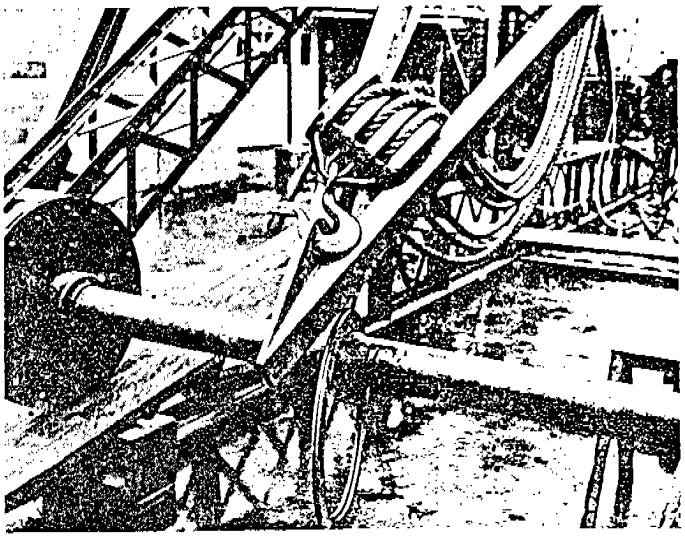
No. 81



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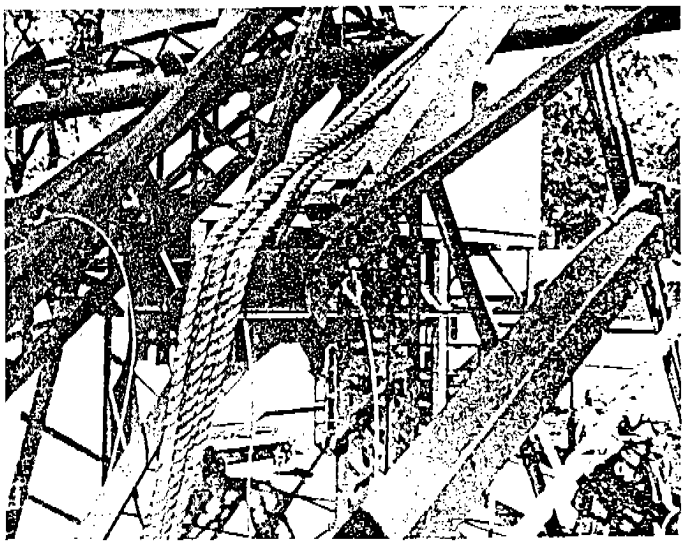

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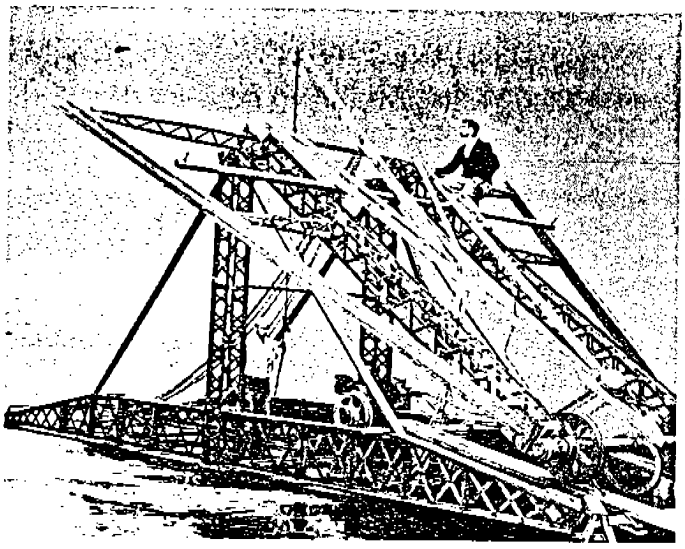

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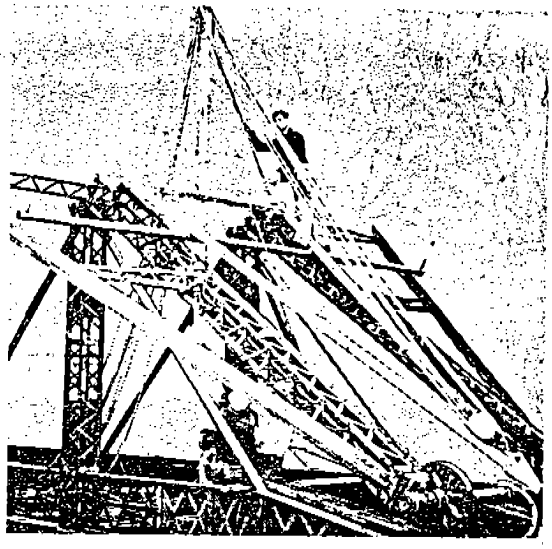

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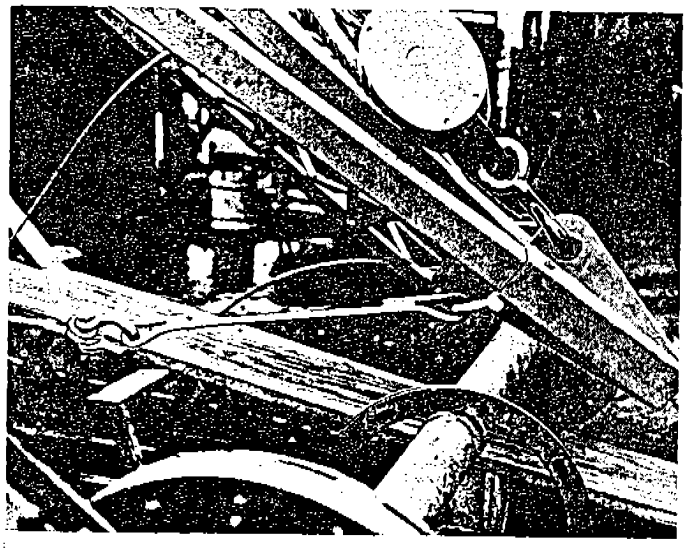

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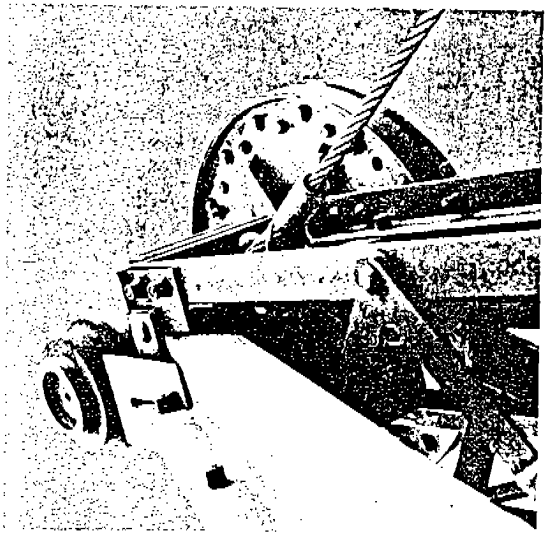

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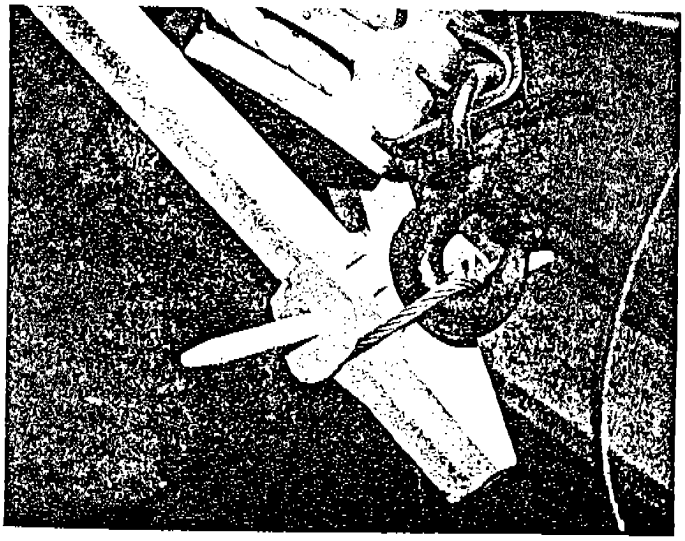

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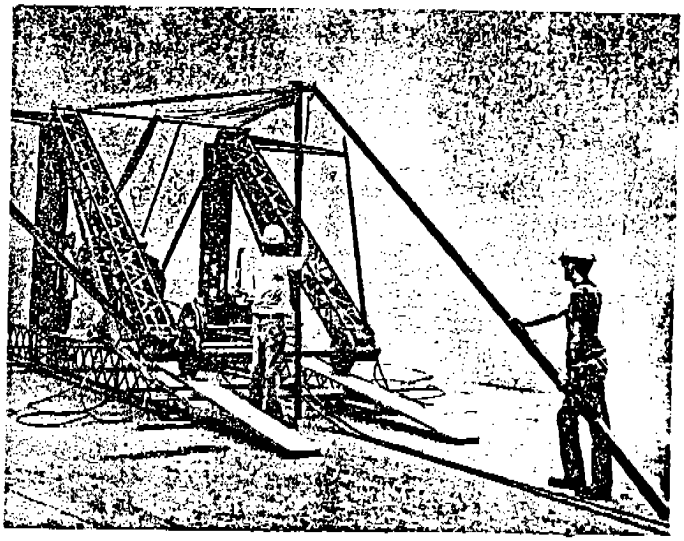


No. 90

Next, unhook the block from the hub rings and pull it out in front the length of a base. See Picture No. 80. It may be necessary to pull the ropes through the blocks by hand. Then carry the block back behind the towers, up one of the towers, and over the cross member of the A-frame, as shown in Picture No. 81. The man who does this should stay up on top of the stub tower.

On the No. 16 model:

Bring the block down to the triangular cap of the large A-frame and hook it in the large hole in the top of the plate. See Picture No. 82. With the triple block hooked into the A-frame cap, pull enough slack in the topes so that they can be pulled back as far as the towers, as shown in Picture No. 83. You need this extra slack before raising the small A-frame.

One of the prop poles has a steel bracket bolted to one end. Tie the end of the spoke rope through the eye on the other end of this prop pole. Hand up the bracket end of the prop pole to the man on top and he can hook it to the pipe welded to the point connection of the small A-frame. See Picture No. 84. Check to be sure that the two cables connecting the two A-frames are securely fastened at both ends. Then, by pulling down and toward the front on the spoke rope, the prop pole pivots, first, over the erecting beam, and then over the cross member of the large A-frame. See Picture Nos. 85 and 86. It swings the small A-frame up and over center. The man on top should steady the small A-frame when he disengages the prop pole so the men on the ground can take it away. The prop pole should immediately be braced against the tower again.

If there is slack in the topes, particularly on the back side of the WHEEL, the ropes should be tightened. A gust of wind could blow over the small A-frame if the ropes are loose. The man on top should brace the small A-frame while the ropes are tightened. The ropes are going in both directions across the top of the small A-frame and it could be pulled back over center if you are not careful. If this happens the small A-frame could drop onto the erecting beam and become bent. Be sure that someone braces it when you take the slack out of the ropes. You will need someone at each triple block to feed the ropes through where the slack is the greatest.

The next thing to do is to connect the short guy cables to the cap of the large A-frame. These two cables are first fastened to the connecting rod with a large clevis, and the connecting rod is then fastened to the bottom side of the A-frame cap with a second smaller clevis, as shown in Picture No. 87. The other end of each cable is hung over the hook just below the main bearing at the top of the tower, and is tied in place with a piece of twine to keep it from jumping off. See Picture No. 88.

On the No. 5 and No. 12 models:

The No. 27 derrick cable has thimbles on each end with a loop formed with cable clamps in the middle. Pass this loop over the point of the malleable casting cap on the A-poles, and let it rest on the flanges on the sides of the casting. See Picture No. 89. Hook the thimbles on the hooks just below the main bearing at the top of each tower in the same way as shown in Picture No. 88. Tie them in place with pieces of twine to keep them from jumping off.

Then raise the point of the derrick with the push poles. Each push pole has a hole in one end. Using first the short push pole, fit it over one end of the pin that locks the malleable casting cap to the ends of the A-poles. Raise the point of the A-frame as far as you can with this 12 foot pole. Then fit the 18 foot push pole on the other end of the pin, brace it against the ground to support the weight of the A-frame, and then remove the 12 foot push pole. See Picture No. 90. Swing the A-frame over center with the long push pole so that it is held by the derrick cable that is connected to the tops of the towers. Then remove the long push pole.

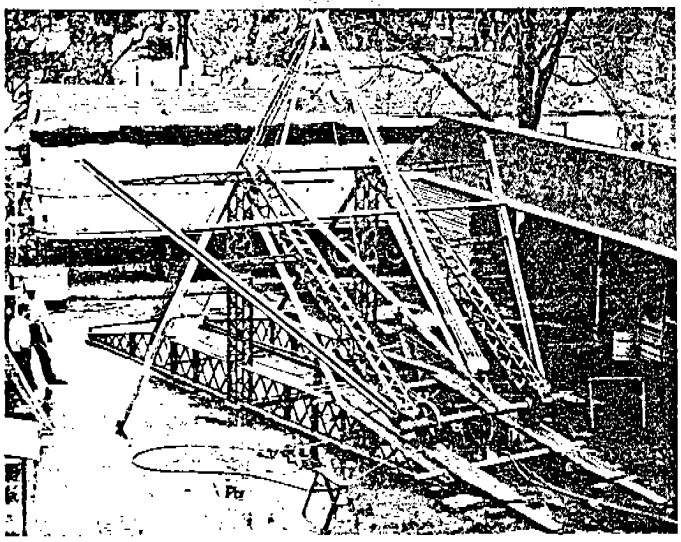
Connect a long corner guy cable to the hook on the underneath side of each tower and tie it in place. Each of the four large turnbuckles has an open hook on one end and a closed eye on the other. Hook the eye over the base hook that is closest to the end of the base on the front side of the WHEEL. Open up the turnbuckle as far as it will go and still have all of the threads holding. Then hook the eye on the end of the corner guy cable over the open hook of the turnbuckle. Hang the spoke rope on the hub rings so it will be on the main axle when it is needed. Pull the spoke rope out in front so it is out of the way.

The No. 16 towers as shown in Picture No. 91 are now ready to hinge up to the upright position. Picture No. 92 shows the appearance of the No. 5 and No. 12 models as the towers are being raised.

Hinging the Towers

Before hinging the towers up to the vertical position, check again to be sure that the cable from the A-frame cap to the top sides of the towers, and from the bottom sides of the towers to the ends of the front bases, are securely anchored.

Then, with a single wrap around the winding spool, take out any slack in the ropes. Next, put a second wrap around the spool. On the No. 16 WHEEL when the point of the large A-frame begins to rise, you may find that it moves up and down, because of friction of the ropes over the small A-frame. Let it rise slowly in stages so that the ropes can adjust themselves. Pulling down on the point of the large A-frame as shown in Picture No. 93 will help to take out the slack. When the large A-frame rises high enough, the ropes will rise above



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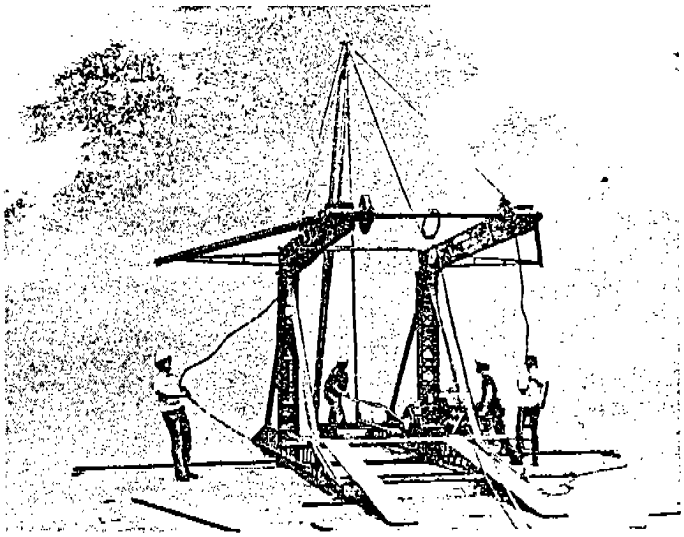

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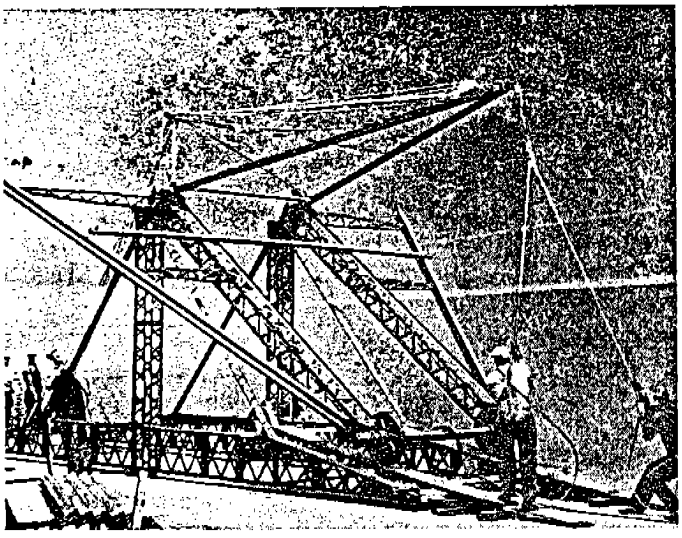

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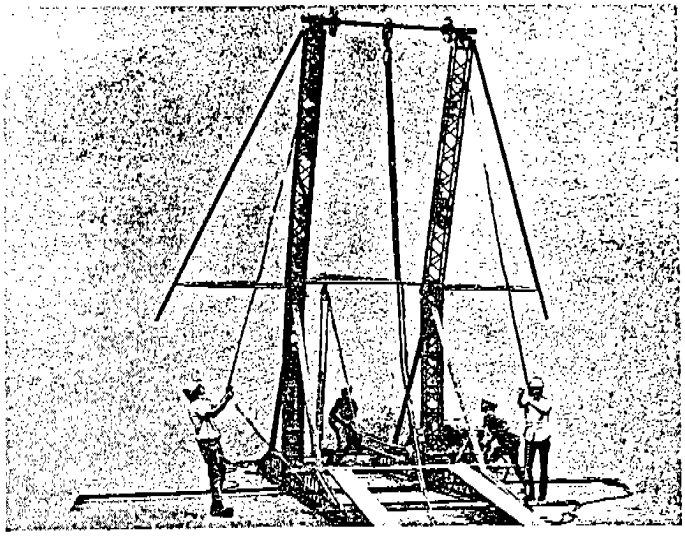

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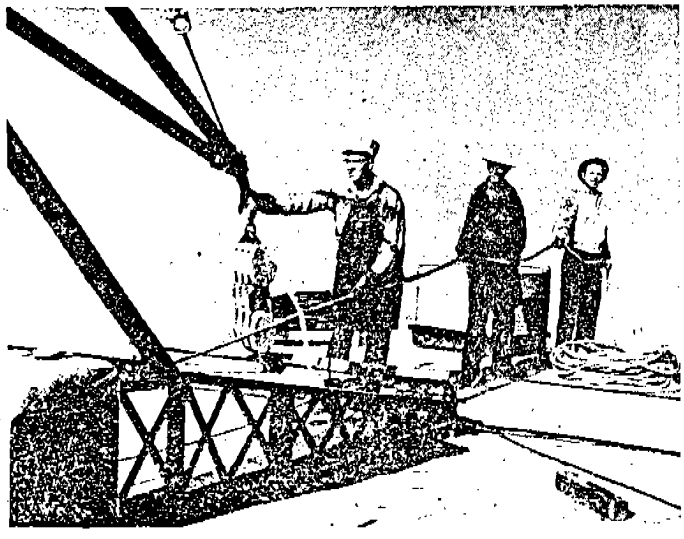

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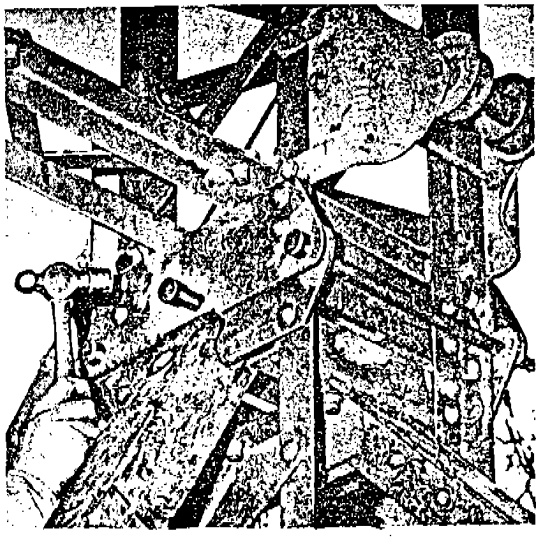

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