MFG.: BRILL, A.K.
NAME: KIDDIE CHAIN PLANE
TYPE: KIDDIE

KIDDIE CHAIRPLANE

THIS IS A DANDY LITTLE RIDE, WITH A LARGE EARNING CAPACITY AND EXTREME PORTABILITY. IT IS LIGHT AND COMPACT AND IF NECESSARY, YOU CAN CARRY IT IN A HOUSE TRAILER.

LET'S START WITH THE TOWER. TOWER IS MADE OF 4PCS OF 2"x2" x1/4" ANGLE STEEL, EACH 8 FEET LONG. IT IS 2 FEET SQUARE AT THE BASE AND 1 FOOT SQUARE AT THE TOP. MAKE THE TOP PLATE OF 1/4" TO 1/2" STEEL PLATE AND FOUR SHORT LENGTHS OF ANGLE STEEL TO FORM A BOX. ON TWO SIDES AT THE BASE, ADD A PIECE OF 2x2x1/4" ANGLE STEEL ON THE BASE AS SHOWN IN FIGURE 1& AND ABOVE ABOUT 6" UP FROM THE BOTTOM, A BOX OF 2x2x1/4" ANGLE. TO SERVE AS A BRACE AND SUPPORT FOR THE MOTOR SHELF. DO NOT ADD THE DIAGONAL BRACES OR ANYTHING ELSE AT THIS TIME. THEY WILL GO IN AFTER THE SHAFT.

MUD SILLS

ON SHEET 2 ARE SHOWN THE MUD SILLS. HERE YOU HAVE A CHOICE. YOU CAN WELD THEM SOLID CUTTING THE SHORT PIECES AND THE ENDS AND WELDING AS SHOWIN IN THE ILLUSTRATION, THIS WOULD BE QUICK TO ERECT THE RIDE, IF YOU WERE CARRYING IT ON A TRUCK, BUT IT WOULD BE MORE PORTABLE IF YOU COULD REDUCE THE MUD SILLS TO A PILE OF CHANNELS. THAT IS THE PART WE WILL TAKE UP. USE 4 CHANNELS--3" WIDE AND 6 FEET LONG. LIGHT GAGE 3" CHANNEL IS SUFFICIENT BUT ANYTHING WILL DO.. IF YOU CAN'T FIND THE CHANNEL YOU WANT IN YOUR TOWN, YOU CAN WELD TWO PIECES OF 1-1/2"x3¾" 16" ANGLE IREON TOGETHER TO MAKE A CHANNELS&IP-WELD--WELD 4", SKIP 4" .

CUT OR BURN A 1-1/2" HOLE NEARE EACH END OF EACH CHANNEL FOR STAKES. OLD AUTO AXLES WITH GEARS ATTACHED ARE BEST, BUT ANYTHING WILL DO. ON THE TWO UPPER CHANNELS WELD SHORT LENGTHS OF SIMILAR CHANNEL AT THE END TO COMPENSATE FOR 2 LOWER CHANNELS, SO IT WILL STAND WITHOUT TIPPING. TO KEEP THE SILLS FROM SINKING, YOU CAN ALSO WELD FLAT PLATES ON THE UNDERSIDE OF THE ENDS OF THE LOWER SILLS. TRY TO SET THE RIDE ON 1" BOARDS SO IT WON'T DIG IN.

LATER, 3/4" HOLES ARE BURNED IN THE SIDE PLATES(ANGLES) OF THE TOWER AND THE CENTERS OF THE SILLS, WHERE THEY CROSS, AND BOLTS WELDED TO THE UNDERSIDE OF THE LOWER SILL TO COMPLETE A SINGLE UNIT OF TOWER AND SILLS.

THE SHAFT

THE SHAFT COMES NEXT--EVEN BEFORE THE CENTER TOWER BRACING. ABOUT 8 FEET IS A GOOD LENGTH, SO IT WILL EXTEND ABOUT 30" ABOVE THE TOWER AND REACH DOWN TO THE LOWER HALF OF THE TOWER. YOU HAVE A CHOICE OF SHAFT--2" COLD ROLLED IF FINE, BUT YOU CAN ALSO USE PIPE, WHICH IS LIGHTER. IF YOU USE TRIPLE STRENGTH(HYDRAULIC TUBING WITH 1/2" WALL) 1-1/2" PIPE O.D. OF 1-1/2" PIPE IS 1.90" AND THE NEAREST BEARING SIZE(UNLESS YOU GET INTO METRIC WOULD BE 1.87½" OR 1-7/8", SO YOU WILL FIND IT NECESSARY TO TURN OR POLISH THE TOP 30" OF THE SHAFT THAT EEXTENDS THROUGH THE TOP AND THE FEW INCHES THAT REST IN THE LOWER BEARING, TO THIS SIZE. IF YOU CAN'T GET THE HEAVY TUBING, USE 1-1/2" EXTRA HEAVY PIPE WHICH HAS AND I.D. OF 1.50" AND PUT IN A LINER OF 1" PIPE WELDED AT THE ENDS TO THE INSIDE EDGE OF 1-1/2" PIPE. EITHER ONE OF THE 3 SET-UPS WILL MAKE A GOOD SHAFT, HOWEVER THE 2" SOLID SHAFT, WILL REQUIRE A FLAT COMMUTATOR, AND OF COURSEE 2" BEARINGS.

BEARINGS

NOW WE MUST DECIDE WHETHER WE WANT THE SHAFT TO DROP DOWN THROUGH THE TOWER, WHEN BEING TRANSPORTED, OR WHETHER YOU WILL ALWAYS HAVE SPACE FOR THE FULL TOWER, WHICH CANNOT BE TRANSPORTED UPRIGHT, BUT IN MOST CASES WILL HAVE TO LAY ON THE FLOOR OF THE TRUCK .

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BEARINGS, CONTINUED:

WE WILL TAKE UP THE TELESCOPING SHAFT FIRST. THE 30" END OF THE SHAFT THAT EXTENDS FROM THE TOWER TOP, SHOULD BE POLISHED WITH EMERY CLOTH OR TURNED IN A LATHE, UNTIL IT WILL FIT THROUGH THE 1-7/8" BEARING. THE SIMPLEST BEARING TO BUY IS A COMBINATION RADIAL AND THRUST BEARING. IT IS NOT EXPENSIVE IF YOU BUY AN "UNGROUND" BEARING. "GROUND" OR "HIGH SPEED" BEARINGS ARE NOT REQUIRED. THE THRUST SUPPORTS THE COLLAR CARRYING THE CROWN--IN FACT YOU CAN WELD THE COLLAR TO THE CROWN. THE BEARING IS SHOWN ON SHEET 2. IT CONSISTS OF A COLLAR-LIKE ARRANGEMENT WITH A SHOULDER RIDING ON A BALL BEARING RACE. BE SURE AND MOUNT IT RIGHT SIDE UP. BEARING IS SLIPPED INTO A SPECIALLY TURNED COLLAR--SOMETIMES YOU CAN FIND A PIECE OF PIPE THAT IS A TIGHT FIT, AND YOU CAN HACKSAW A PIECE OF OF IT, OR YOU MAY HAVE TO TURN A CUP. ANYWAY A CUP OR PIPE IS WELDED TO THE TOWERR TOP.

THERE ARE OTHER TYPES OF BEARINGS THAT CAN BE USED. A SIMPLE THRUST BEARING, CONSISTING OF 3 PARTS--2 DEEPLY GROOVED HARD WASHER LIKE PIECES AND A RING OF BALL OR ROLLER BEARINGS. THIS SET-UP CAN REST LOOSELY ON THE TOWER TOP, THE BORE BEING LARGER THAN THE SHAFT, AS IT MUST MAKE CONTACT HORIZONTALLY FOR THE THRUST THAT IS VERTICAL. IN OTHER WORDS, IT CARRIES THE WEIGHT OF THE CROWN--THE ONLY THING BETWEEN THE CROWN AND THE TOWER TOP. NOW DIRECTLY BELOW THE TOWER TOP IS A CUP OR SLEEVE BEARING. THE THRUST BEARING CANNOT BE USED ALONE AS IT HAS MUCH PLAY--IT MUST BE LOOSE TO OPERATE. A FLANGE BEARING IS USED FOR RADIAL THRUST, THIS SHOULD BE MOUNTED UNDER THE TOWER TOP. IT KEEPS THE SHAFT ALIGNED. BE SURE THE BOLT HEADS CLEAR THE THRUST BEARING ON TOP OF THE TOWERR

ANOTHER ARRANGEMENT CAN BE USED, WHERE ONLY THE RADIAL BEARING IS USED AT THE TOWER TOP, WITH A THRUST BEARING USED ON THE SUPPORT BELOW THE GEARS. EITHER FLANGE, BALL OR BRONZE BEARING CAN BE USED AND THEY CAN BE PLACED ABOVE OR BELOW THE TOP AS DESIRE

THE CROWN

WE ARE NOW READY FOR THE CROWN. A STEEL COLLAR--REGULAR STOCK JOUB--DO NOT BUY THE CAST IRON COLLAR, IF YOU ARE USING THE THRUST BEARING ON TOP OF THE TOWER--AND A 1/2" PLATE OF STEEL, ABOUT 10" OR 12" IN DIAMETER. THE PLATE SHOULD HAVE A HOLE TO SLIP OVER THE SHAFT, A PIPE FLANGE WITH THE THREADS TURNED OFF, FOR A SLIDING FIT, GOES ON TOP OF PLATE, BUT BEFORE ANY PERMANENT ASSEMBLY IS DONE, THE THREE ARE LINED UP WITH THE FLANGE ON TOP, THE PLATE BELOW AND THE COLLAR AT THE BOTTOM. THE COLLAR IS DRILLED FOR A HARD STEEL PIN TO GO THROUGH THE PIPES AND OUT THE OTHER SIDE OF THE COLLAR. THE THREE ARE WELDED TOGETHER FOR A SLIDING FIT ON THE SHAFT.

NOW SHORT LENGTHS--2 OR 3" LONG OF 1-1/4" PIPE ARE PLACED EQUADISTANT AROUND THE EDGE OF THE CROWN--SIX OF THEM. THEY CAN EXTEND FROM THE EDGE OF PIPE FLOOR FLANGE TO THE EDGE OF THE CROWN, OR CAN PROTRUDE OVER THE EDGE OF THE PLATE IF NECESSARY. IT WILL ALSO BE EASIER TO WELD THESE PIPES TO THE PLATE, BEFORE ATTACHING THE CROWN TO THE SHAFT. THE SAME SET-UP IS USED FOR THE 2" COLD ROLLED SHAFT, BUT A PIECE OF 2" PIPE IS PLACED INSIDE THE 2" PIPE FLANGE. FOR THE 1-1/2" PIPE, A 2" PIPE FLANGE WITH 2" EXTRA HEAVY PIPE IN THE FLANGE, THROUGH THE PLATE, ADDS GREATER STRENGTH.

THE UPPER CROWN

UPPER CROWN IS HALF INCH THICK PLATE, ABOUT SIX INCHES IN DIAMTETER WITH SIX EQUADISTANT (EVENLY SPACED) HOLES AROUND THE EDGE. 5/8" IS A GOOD DIAMETER FOR THE HOLES. IF YOU CUT A TIGHT HOLE AROUND TH SHAFT, YOU CAN DO IT WITHOUT ADDITIONALL SUPPORT, BUT MOST LIKE TO MAKE THE RIDE STRONGER AND ADD ANOTHER HALF INCH PLATE, ABOUT 4" IN DIAMTER, AND A COLLARR BENEATH IT. FOR PRACTABILTITY; IT IS NOT NECESSARY, THE HALF INCH PLATE WITH A TIGHT HOLE, WELDED TO THE SHAFT WILL WITHSTAND ANY USE A SMALL RIDE LIKE THIS WILL GIVE IT. DO NOT FINSH WELDING AT THIS TIME HOWEVER, UNTILL ALL THE WORK ON THE LOWER CROWN, THE COMMUTATOR AND LOWERR BEAINGS AND GEARS ARE IN PLACE ON TRIAL FIT.

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GEARS

THE DIFFERENTIAL GEARS—THE RING GEAR, AND PINION AND CARRIER, YOU DON'T NEED THE SPIDER GEARS—OF A CAR OR PICK-UP TRUCK ARE USED. IF YOU WANT YOU CAN USE THE WHOLE REAR END, BUT IT WILL BE HEAVIER. YOU WILL HAVE TO WELD THE SPIDER GEARS SHUT .. THE CARRIER WILL HAVE TO BE BORED TO ACCOMODATE THE PIPE SHAFT, OR IF YOU USE A SOLID SHAFT, YOU CAN HAVE THE END TURNED DOWN TO ACCOMODATE THE CARRIER. YOU CAN ALSO USE AS PIECE OF SHAFT IN THE CARRIER, AND WELD IT TO THE PIPE SHAFT. IF YOU DO NOT WANT TO USE AUTO GEARS(THEY ARE CHEAP AT ANY JUNKED CAR YARD), WNY CROWN GEAR AND PINION WILL DO. A COLAR ALSO GOE S ON THE SHAFT AS SHOWN ON SHEET 2, BUT DO NOT WELD IT AT THIS TIME.

SUPPORT BRACES

FIGURE 33 SHOWS THE SUPPORT BRACE. IT IS MOUNTED IN THE TOWER, BELOW THE CENTER TO ACCOMODATE SHAFT 4, CARRYING THE PINION GEAR. IT IS MADE OF 2" ANGLE AND HAS A BEARING SEAT, A HEAVY WASHER AS SHOWN, WELDED IN PLACE. THIS CAN ALSO CARRY THE THRUST BEARING IF NONE WAS USED AT THE TOP, AND IT SHOULD ALSO CARR Y A RADIAL BEARING TO TIE THE SHAFT BETWEEN TWO RADIAL BEARINGS FOR SMOOTH OPERATION. ANOTHER COMBINATION RADIAL AND THRUST UNIT COULD BE USED HERE. HOWEVER, ITS CHIEF FUNCTION IS TO KEEP THE PINION GEA R IN MESH WITH THE RING OR BEVEL GEAR. THE RING GEAR AND CARRIER SHOULD BE SO M MOUNTED THAT THEY POINT DOWN ON THE PINION. THE FIT IS CRITICAL--SHIM IT UP UNTIL PERFECT MESH IS OBTAINED.. BE SURE THE SHAFT GOES INTO THE RADIAL BEARING 33, AT LEAST 2", MORE IS BETTER, BUT NOT SO MUCH SO THE COMMUTATOR BELOW THE TOWER TOP IS INJURED WHEN THE SHAFT IS RAISED TO THE TOP TO TELESCOPE IT. THE SET-UP IS THAT THE PIN IN THE LOWER CROWN IS PULLED AS SHAFT IS RAISED TO GET OUT THE LOWER BEARING, THEN SHAFTI IS LOWERED BESIDE THE BEARING AS IT SLIPS DOWN INTO TOWER. THE SHAFT CARRIES A 12" DOUBLE GROOVE "V" BELT PULLEY ON THE OUTSIDE OF THE TOWER.

LOWER SHAFT

FIGURE 5 IS AN ADDITIONA L SHAFT TO CUT DOWN THE SPEED. THIS MOUNTS ON THE OUTSIDE OF THE TWOER ON SUITABLE BEARINGS AND THE SMALL 2" PULLEY LINES UP WITH THE LARGE PULLEYO ON SHAFT 4. THE 12 " PULLEY ON SHAFT 5 CAN BE A SINGLE GROOVE, BE SURE AND USE SHAFTS AT LEASST 3/4" IN DIAMETER FOR BOTH SHAFTS 4 AND 5.

M OTOR

THIS RIDE WAS BUILT RIGHT AFTER WORLD WAR II AND THE ONLY MOTOR AVAILABLE WAS A HALF HORSE. IF YOU WANT TO USE A HALF-HORSE TO CUT DOWN THE COST, YOU W ILL HAVE TO MAKE PROVISIONS FOR STARTING. THE HALF-HORSE EASILY PULLS TWELVE CHILDREN AROUND, BUT IT WON'T START WITH THEM. IN THE ORIGINAL, THE OPERATOR STOOD NEXT TO THE TOWER AND PULLED ON THE BELT, AS HE TURNED ON THE SWITCH. IF YOU WOULD USE A MERCURY, FARM EASY OR ANY OTHER CHEAP(ABOUT $10) CENTRIFUGAL CLUTCH, YOU MAY GET JBY WITH THE HALF HORSE, BUA A 3/ 4 HORS OR I HP WILL START IT WITHOUT A CLUTCH. IF YOU WANT TO USE THE SMALL MOTOR AND NOT BUY A CLUTCH, MAKE A SLIDING MOTOR AS SHOWN ON BOTTOM OF SHEET 3. THE MOTOR IS MOUNTED ON A PLATE, THE PLATE SLIDES BETWEEN SIX ANGLES(STEEL) 1x1x1/8" IS HEAVY ENOUGH. WHEN MOTOR HAS REVVED UP TO PROPER SPEED, THE LEVER IS PULLED, DRAWING THE MOTOR BACK, TIGHTENING THE BELT. IT STARTS WITHOUT A LOAD AND GRADUALLY SHOULDERS THE LOAD--LIKE HELPING PULL ON THE BELT.

OF COURSE THE MOST SIMPLE WAY TO SOLVE THE PROBLEM IS THE BIGGER MOTOR. USE A CAPACITOR TYPE MOTOR IS YOU USE A CENTRIFUGAL CLUTCH..A REPULSION-INDUCTION IF YOU DRIVE WITHOUT A CLUTCH OR SLIDING BELT. DO NOT USE SPLIT PHASE MOTORS, THEY REQQIRE TOO MUCH ELECTRICIT Y TO START.

A 2" PULLEY ON THE MOTOR, AND A 12" PULLEY ON END OF SHAFT 5, TO A 2" TO 12" ON SHAFT 4, WILL DRIVE THE RIDE AT A LITTLE OVER 8 RPM FROM 1725 RPM MOTOR. CENTRIFUGAL CLUTCH PULLEYS ARE LARGE R THAN 2" SO YOU MUST USE A LARGER THAN 12" OR A SMALLER THAN 2" ELSEWHER. IF A TRUCK GEAR IS USED, IT HAS GREATER REDUCTIONS THAN AUTO GEARS AND YOU NEED LESS PULLEY REDUCTION. MOUNTING THE MOTOR LOW, ADDS STABILTIY TO THE RIDE -BUT IT SHOULD BE HIGH ENOUGH TO AVOID A WATER SOAKED FIELD.

SWITCH

THE SWITCH SHOULD BE ON A FENCE POST, OUTSIDE THE RIDE, OR ON BACK OF THE TICKET BOX, UNLESS YOU ARE USING MANUALLY OPERATED CLUTCH, A SLIDING MOTOR OR PULLING THE BELT. IN THIS CASE IT MUST BE MOUNTED ON THE TOWER. HAVE YOUR MOTOR WIRE END IN A PRONGED OR BAYONET PLUG CONNECTION, SO THE TOWERR CAN BE MOVED WITHOUT THE SWITCH. A FEMALE PLUG ON THE END OF THE WIRES FROM THE SWITCH FITS THE MOTOR PLUG. USE A REGULAR FUSED ENCLOSED SWICH LIKE A "SQUAR D" IN WEATHER PROOF BOX. THESE CAN BE PURCHASED DOUBBE POLE SINGLE THROW. A LOW PRICED SEARS ROEBUCK ONE WORKS AS WELL AS THE HIGHER PRICED

LIGHTS AND C OMMUTATOR

WHILE WE STILL ARE ON THE SUBJECT OF SHAFT AND TOWER--AND OF COURSE BEFORE BUILDING IT, WE SHOULD DISCUSS THE COMMUTATOR AND LIGHTS. IF YOU USE THE SHAFT MADE OF PIPE, YOU CAN MOUNT IT UNDER THE TOWER TOP. IT SHOULD BE FAR ENOUGH DOWN, SO WHEN YOU PULL THE SHAFT UP TO TELESCOPE IT, IT WILL NOT INTERFEER UNTIL SHAFT IS SAFELY OUT OF THE LOWER BEARING.

FIGURE 23 ON SHEET 3 SHOWS THE ASSEMBLED COMMUTATOR. IT IS MOUNTED DIRECTLY UNDER THE TOWER, WHICH OF COURSE CAN BE DONE ONLY ON THE NON-TELESCOPING UNIT. YOU WILL HAVE TO MOUNT IT A FEW INCHES LOWER FOR THE TELESCOPEL A WOODEN CYLINDER--IT CAN BE SOLID WITH A HOLE THAT IS A SNUG FIT ON THE SHAFT, OR IT CAN BE MADE IN TWO PIECES TO BE PUT ON AFTER THE RIDE IS BUILT. IT SHOULD BE ABOUT 8" TALL AND ABOUT 5 OR 6 INCHES IN DIAMETER. OAK IS GOOD TO TURN IT FROM. IT SHOULD BE BUILT OF GLUED UP STOCK, SO IT WONT SPLIT. COPPER RINGS SHOULD BE MADE OF 1/8" STOCK. MAYBE YOU CAN CUT SOME BANDS FRO M A LARGE COPPER TUBE, OR A COPPER COFFEY POT. IF NOT JUST BEND A STRAP OF 1/2 TO 1" BY 1/8" STOCK TO FORM A RING. SET IT ON THE CYLINDER AS SHOWN, ABOUT 2" FROM THE OTHER END. GIVING ABOUT 4" SPACE BETWEEN THE TWO BANDS. USE FLAT HEAD COUNTERSUNK SCREWS. NOOW SOLDER INSULATED WIRE--WITH ENDS BARED OF COURSE, WHERE THEY TOUCH THE RINGS, PARALLEL TO EACH RING. IT CAN BE ON THE INSIDE OR OUTSIDE, BUT MUST BE SO PLACED THAT IT WILL NOT INTERFERE WITH THE "FINGERS". HOLES ARE DRILLED AND THE WIRE GOES THROUGH THE WOODEN CYLINDER INTO THE PIPE SHAFT. THE WIRES SHOULD BE LONG ENOU GH TO REACH THE UPPER CROWN. IF IT IS A TELESCOPING SHAFT, AND ENDS IN AN OUTLET, THE WIRE SHOULD BE LONG ENOUGH FOR THE LOWER CROWN IN A RIGID SHAFT.

A SUITABLE PIECE OF MARINE PLYWOOD, PLASTIC, OR MASONITE IS SUPPLIED WITH A COUPLE STRIPS OF 1/2"x1/8" COPPER IN SUCH A WAY THAT THE METAL TOUCHES ONLY THE INSULATED BOARD. THIS IS HINGED TO ANOTHER PIECE OF PLYWOOD THAT IS MOUNTED ON A BRACKET THAT GOES TO THE SIDE OF THE TOWER IF IT IS A TELESCOPING SHAFT, OR TO THE LOWER SIDE OF THE TOWER TOP, IF IT IS A PERMANENT SHAFT. WIRES ARE RUN TO THE FINGERS. BE SURE THEY ARE INSULATED, EXCEPT WHERE THEY TOUCH THE FINGERS. THEY SHOULD BE SOLDERED WELL. NOW SPRING IS ARRANGED TO DRAW THE FINGERS IN CONTACT WITH THE BANDS ON THE CYLINDER. THUS CURRENT FED INTO THE THE WIRE WILL BE CARRIED UP THE INSIDE OF THE SHAFT TO AN OUTLET PLUG MAKING NEAR THE UPPER CRWON., OR LOWERR CROWN AS THE CASE MAY BE. A CHEAPER WAY OF MAKING IT IS TO USE SEVERAL LAYERS OF AUTO OR TRUCK RADIATOR HOSE, OVER EACH OTHER, INSTEAD OF THE WOODEN CYLEINDER. IF KEPT DRY, IT INSULATES JUST AS WELL.

DISC COMMUTATOR

NOW IN CASE YOU ARE USING A SOLID SHAFT, YOU MUST MAKE A DISC COMMUTATOR. THIS FITS UNDER THE LOWER CROWN. IT CONSISTS OF ABOUT AN EIGHT INCH DISC OF HEAVY PRESSED BOARD, PLASTIC OR PLYWOOD. TO WHICH TWO THIN FLAT RINGS OF COPPET. HAVE BEEN AFFEXED TO THE UNDERSIDE. YOU CAN CUT THSES FROM AN AN OLD COPPER BOTTOMED COOKING VESSEL, OR FROM A COPPER PLATE. THEY SHOULD BE AT LEAST AN INCH WIDE AND ABOUT TWO INCHES APART. THE ENTIRE PLATE IS MOUNTED ON THE UNDERSIDE OF THE LOWER CROWN, WHICH MUST BE HIGH ENOUGH ABOVE TOWE R TOP TO CLEAR SET-UP. GET SOME COPPER WEATHER STRIP, SPRING VARIETY SUCH AS USED UNDER DOORS, FROM WHICH TO MAKE THE FINGERS. M OUNT THEM ON A WELL INUSLATED BLOCK OF INSULATED MATERIAL IN SUCH A MA NNER THAT THE FINGERS TOUCH THE BANDS. ELECYRICITY FED TO THE FINGERS, IT CARRIES IT TO THE BANDS, WHICH HAS WIRES LEADING TO A PLUG ON TOP THE LOWERR CROWN.. HANDLE CAREFULLY WHILE TELESCOPING THE SHAFT IF SUCH A SET-UP IS USED.

[illegible] LINE

FUSE [illegible]ICH FUSE SWITCH

IT WOULD BE EXTRAVAGENT TO PURCHASE ANOTHER SWITCH TO OPERATE THE LIGHTS, YET THEY MUST BE FUSED FOR SAFETY AND IT MUST BE POSSSIBLE TO TURN THEM ON AND OFF. A PIGTAIL PLASTIC OR RUBBER SOCKET, THAT IS A SOCKET WITH TWO WIRES PROTRUDING, IS WIRED INTO ONE SIDE OF THE LINE. THERE SHOULD BE A BRANCH LINE OF TWO WIRES GOING TO THE LIGHTS TAPPED INTO THE MAIN LINE, AHEAD OF THE RIDE SWITCH. IT SHOULD END IN A FEMALE PLUG, AND A PRONGED OR BAYONET PLUG LED TO LIGHTS. NOW IT'S ON ONE WIRE OF THE LEAD LIN THAT THE PIGTAIL SOCKET SHOULD BE CUT IN. USE A GLASS FUSE. TURNING THE FUSE IN, MAKES CONTACT—TURNING IT OUT, BREAKS THE CIRCUIT. REMOVE THE FUSE AND PUT IN A DEAD ONE. WHEN YOU WANT TO LEAVE THE RIDE, AND THE LIGHTS WILL BE TAMPER PROOF. SHEET 3 SHOWS THE PIGTAIL SOCKET SET-UP.

DIAGONAL BRACES

D IAGONAL BRACES CAN BE MADE FROM 1 INCH BY ONE-EIGHTH OF THREE -SIXTEENTH INCH BAR STOCK. THIS COMPLETES THE TOWER.

SWEEPS

SWEEPS ARE SHOWN IN DETAIL ON SHEET 3. FIGURES 10 AND 11. THEY ARE MADE OF 1" EXTRA-STRONG PIPE AND RE 7-1/2 FEET LONG. THEY ARE DRILLED FOR 3 HALF-INCH EYE-BOLTS. ONE ABOUT FOUR INCHES FROM THE OUTSIDE END, ONE FOR HANGING BRACE ABOUT 2" INSIDE THE FIRST ONE. THE THIRD ONE ABOUT 16 INCHES IN, BUT IT IS BEST TO WAIT UNTIL YOU HANG THE SEATS, UNTIL YOU DRILL FOR THE THIRD. THE SEATS SHOULD HANG 4 TO 6" APART WHICH OF COURSE REQUIRES THE EYE-BOLTS TO BE MUCH FARTHER APART.

THE 2ND EYEBOLT IS FOR THE HANGING OR SKY BRACE, SO IT IS ON THE OPPOSITE SIDE OF THE PIPE, THAN THE OTHER TWO., WHICH ARE FOR THE CHAIRS. TWO 3/4" NUTS (SQUARE ONES IF YOU CAN FIND THEM) ARE WELDED TO EITHER SIDE OF THE SWEEP, NEAR THE ENDS FOR THE SPREADER BRACES. THIS IS THE SIMPLEST AND CHEAPEST WAY. HOWEVER IF YOU PREFER, YOU CAN MAKE A BRACKET OF 1#1/2" X 3/16" BAR STOCK, BENT HALF WAY AROUND THE PIPE AS SHOWN IN FIGURE 11. SWEEP SHOULD BE NUMBERED AND REPLACED IN THE SAME SOCKET EACH TIME. SOME PREFER TO DRILL SOCKET AND SWEEP FOR A PIN, BUT IT IS NOT NECESSARY IN A SLOW MOVING RIDE LIKE THIS.

SKY BRACES

FIGURE 12 IS THE SKY OR HANGING BRACE. THIS CAN BE 1/ 2" ROUND STOCK. IT CAN BE BENT INTO AN EYE AT THE LOWERR END AND LOOPED THROUGH THE EYEBOLT ON THE SWEEO, OR YOU CAN PUT A HOOK IN IT AND PILE IT SEPARATELY WHEN TRANSPOSTING. UPPER END GOES THROUGJH THE HOLE IN THE UPPER CROWN. YOU CAN HEAT BEND WITH A TORCH TO SIMPLIFY BENDING. GET A SLIGHT SLANT ON THE TONGUE., SO YOU WILL HAVE TO BEAR DOWN WHEN IT GOES THROUGH THE UPPER CROWN--- THIS WILL KEEP IT FROM WORKING OUT.

SPREADER BRACES

FIGURE 13 IS THE SPREADER BRACE. IT IS MADE OF 1/2" BAR STOCK. BENT TO GO BETWEEN THE SWEEPS. AS THE RIDE SHOULD OPERATE COUNTER CLOCKWISE (IN USE, ENGLAND AND EUROPEAN COUNTRIES GO CLOCKWISE) YOU CAN MAKE AN EYE IN THE SPREADER BRACE ON THE [illegible]LLING SIDE. JUST INSERT STOCK THROUGH THE HOLE IN THE NUT, HEAT AND BEND. OPPOSITE END SHOULD EXTEND THROUGH THE NUT ON THE NEXT SWEEP, AT LEAST 3" ON A SLANT. WITH EYES IN SPREADER AND SKY BRACES, 3 PIECES STAY TOGETHER AND YOU HAVE ONLY SIX TO HANDLE IN-STEAD OF 18. YOU CAN FASTEN CLIPS OF SPRING METAL TO THE SWEEP TO HOLD THE SKY AND SPREADER BRACE CLOSE SO THEY WILL NOT TANGLE WHEN YOU MOVE, OR YOU CAN USE A HEAVY RUBBE BAND .

CHAINS

I USE REGULAR PORCH SWING CHAINES(TECHNICALLY KNOWN AS NUMBER 3-0) FIGURING IF THEY ARE STRONG ENOU GH TO HOLD TWO TO FOUR ADULTS AND A HEAVY SWING, IT IS SAFE ENOUGH FOR ONE LIGHT WEIGHT SEAT AND ONE CHILD. YOU CAN HAVE THEM COME TO A POINT AS IN FIGURE 18 OR HAVE FOUR CHAINS RUN TO A RING WITH A L OOP OR "S" HOOK TO GO TO THE EYE BOLT. THE SAME FOR THE BOTTOM. YOUU CAN WELD LOOPS OR EYEBOTS SHOWN IN THE SEAT ILLUSTRATION ON SHET 2, BUT SMALL CIRCLES AND THE END THE CHAINS IN "S" HOOKS. IN THIS WAY YOU GET A DOUBLE SWIVE ACTION--THE CHAIN LINKS, THEMSELVES ARE NOT RUBBING AGINST THE FIRM EYEBOLTS AND HAVE ONLY THE FRICTION IN THEIR POSITION. SEATS SHOULD BE ABOUT 15" ABOVE THE GROUND, LOWER, IF YOU CATER ONLY TO TINY TOTS.

SEATS

SEATS ARE SHOWN IN DETAIL IN FIGURES 15, 16, 17 ON SHEET 2. THEY CAN BE MADE ABOUT A FOOT SQUARE AND SIX INCHES DEEP. 1-1/2"x1/4 FLAT BAR STOCK WAS USED IN THE ORIGINALS. THE 12" SQUARE SEAT IS THE SAME SIZE AS THE ORIGINAL. IT'S PLENTY BIG FOR SMALL CHILDRENN AND THE LARGE ONES WON'T BE ATTRACTED IF THERE IS ANYTHING BIGGER ON THE LOT ANYWAY. HOWEVER IT WOULDN'T HURT TO HAVE A COUPLE OF 14" WIDE SEATS IN THE GROUP. LOOPS OR EYE-BOLTS ARE WELDED TO THE SEAT FRAME AS SHOWN BY SMALL CIRCLES IN PERSPECTIVE SEAT VIEW. BELOW, FIGURE 17. WOODEN BOARD SEATS MADE OF WEATHERPROOF PLYWOOD. THEY ARE MORE COMFORTABLE THAN METAL SEATS, AND CAN BE UPHOLSTERED WITH PLASTIC AND FOAM IF DESIRED. A METAL CHAIN FASTENED WITH A HARNESS SNAP, GOES ACROSS THE FRONT OF THE SEAT AS A SAFETY GUARD. IT CAN BE COVERED WITH RUBBER OR PLASTIC HOSE FOR GREATER BEAUTY. AN ADDITIONAL CHAIN SUSPENEDED FROM THE CENTER OF THE SAFETY CHAIN, ALSO COVERED WITH HOSE , SHOULD HAVE A CLASP TO FIT A RING AT THE BOTTOM. FOR VERY SMALL CHILDREN, HOOK THIS CHAIN FROM THE SAFETY CHAIN TO THE SEAT, BETWEEN THEIR LEGS , SO IT IS IMPOSSIBLE FOR THEM TO FALL OUT. BE SURE THE CHAINS ARE THOROUGHLY ATTACHED AND THE LOOP OR EYE-BOLTS THAT CARRY THEM ARE WELDED.

IF YOU WANT A MORE ELABORATE SETUP, ALTHOUGH IT WILL BE MORE TO CARRY, STEEL LAWN CHAIRS, KIDDIE SIZE ARE SHOWN ON SHEET 3 IN ILLUSTRATION 34 ARE IDEAL. YOU WILL HAVE TO ADD A FEW BARS ON THE SIDE, SO THEY CAN'T SLIP OUT, AND YOU WILL HAVE TO REINFORCE THEM WITH WELDING TO MAKE THEM SUITABLE FOR THIS JOB. BE SURE THE LOOPS TO CARRY THE CHAINS ARE FASSTENED TO THICK STOCK. SOME TIMES IT IS NECESSARYRTO ADD A REINFORCEMENT PLATE D SHEET METALL TO MAKE THE WELDS HOLD.

LIGHTS

IF YOURS IS A PORTABLE RIDE, FORGET ABOUT THE FLUORESEENT LIGHTS AND BE CONTENT WITH A STRINGER. USE PIG-TAIL OR PIN-ON SOCKETS. IF YOU USE PIN SOCKETS, YOU MUST USE STRANDED WIRE. IT SHOULD BE WEATHERPROOF PLASTIC OR RUBBER COVERED AND NUMBER 14 IS AS SMALL AS SHOULD BE USED. IN PIN SOCKETS, YOU LAY THE TWO SINGLE WIRES IN GROOVES, SCREW ON THE CAP, AND THE PINS PENETRATE THE INSULATION AND MAKE CONTACT. A LINE LEADING FROM THE COMMUTATOR OUTLET PLUG--BE IT AT THE UPPER OR LOWER CROWN, GOES TO THE FIRST STRINGER. THIS SHOULD BE A LITTLE LONGER THAN THE SPREADER BRACE AND HAVE A FEMALE SOCKET ON ONE END AND A BAYONET PLUG ON THE OTHER END. 3 LIGHT SOCKETS TO EACH SPREADER. IF YOU USE DETACHED SPREADER BRACES YOU CAN LEAVE THE LINES TAPED TO THEM. ANOTHER WAY IS TO TAPE THE SOCKET LINES TO THE SPREADER BRACE, EACH TIME YOU ERECT THE RIDE. SOME PREFER ALL 8 SOCKETS ON ONE STRINGER AND TAPED OR CARRIED ON HOOKS TO ALL SPREADERS (REMOVED EACH TIME IS TRANSPORTED) YOU CAN STILL GET A FLASHIER OUTFIT, USING SMOOTHE SIDE SOCKETS, THROUGH 1" BOARDS, ALMOST AS LONG AS THE SPREADERS. THESE WILL KEEP THE SOCKETS IN AN EVEN LINE. THEY CAN HANG ON THE SPREADERS WITH HOOKS.

PARACHUTES

MAKE PARACHUTES OUT OF PLASTIC CLOTH ATTACHED TO WIRES LIKE AND UMBRELLA. THESE FIT BELOW THE SWEEPS AND ARDE IN GAY COLORS WHICH ADD TO THE RIDE'S ATTRACTIVENESS. THEN SO TOO, WHHE TOT WHO RIDES THE "PARACHUTE" RIDE HAS SOMETHING MORE TO TALK ABOUT THAN THE FELLOW WHO JUST RODE ON THE FLYING CHAIRS.

AALTERNATE TOP AND CRESTINGS

YOU CAN STILL ADD GREATER DECORATION TO YOUR RIDE BY ADDING A STRIPED CANVAS OR PLASTIC TOP AND SKY BOARDS. FIURE 19 THROUGH 22. FIRST MAKE THE CRESTS, FIGURE 22. THEY ARE BOX-LIKE AFFAIRS, 12" TALL AND 8" WIDE 6" DEEP. A SOLID BOARD IN THE BACK CARRIES THE PIPE FLOOR FLANGE WHICH IS REAMED OF THREADS AND DRILLED FOR A PIN TO GO IN THE SWEEP END. THE FRONT GETS A FROSTED GLASS OR WHITE PLASTIC. USE 3/4" PLYWOOD FOR THE FRONT AND YOU CAN MAKE THE ROOF AS PLAIN OR AS FANCY AS YOU DESIRE. BACK BOARD CARRIES TWO SOCKETS, WHICH CAN BE EQUIPPED WITH COLORED BULBS TO ADD VARIET TO WHITE LIGHTS.

SKYBOARDS ARE MADE OF 1"x1" FRAMES WITH MASONITE OR POLISHED ALUMINUM SPRAYED WITH CLEAR LAQUER IF YOU WANT A MIRRORED FINISH. YOU CAN USE STRAIGHT SIDE SIGN SOCKETS THROUGH 1-1/4 x2" BOARD BEHIND THE SKY BOARDS TO CARRY LIGHTS IN A STRAIGHT LINE IF DESIRED. THEY ARE JOINED WITH SOCKETS LIKE THE SPREADER BRACE LIGHTS THEY REPLACE.

KIDDIE CHAIRPLANE

FENCE

FENCE IS MADE AS SHOWN ON SHEET 5. A HARROW DISC MAKES A GOOD FOOT FOR 1" PIPE, WHICH IS SURMOUNTED BY A 30" 3/4" PIPE WITH A LOOP FOR A ROPE. YOU CAN ALSO USE 4" CHANNEL IRON FEET, 16" SQUARE FOR FEET, AND YOU CAN ALSO MAKE FENCE SECTIONS AS SHOWN IN FIGURE 3. THESE ARE MADE OF THINWALL ELECTRICAL CONDUIT AND 1/4" RCUND BAR STOCK.

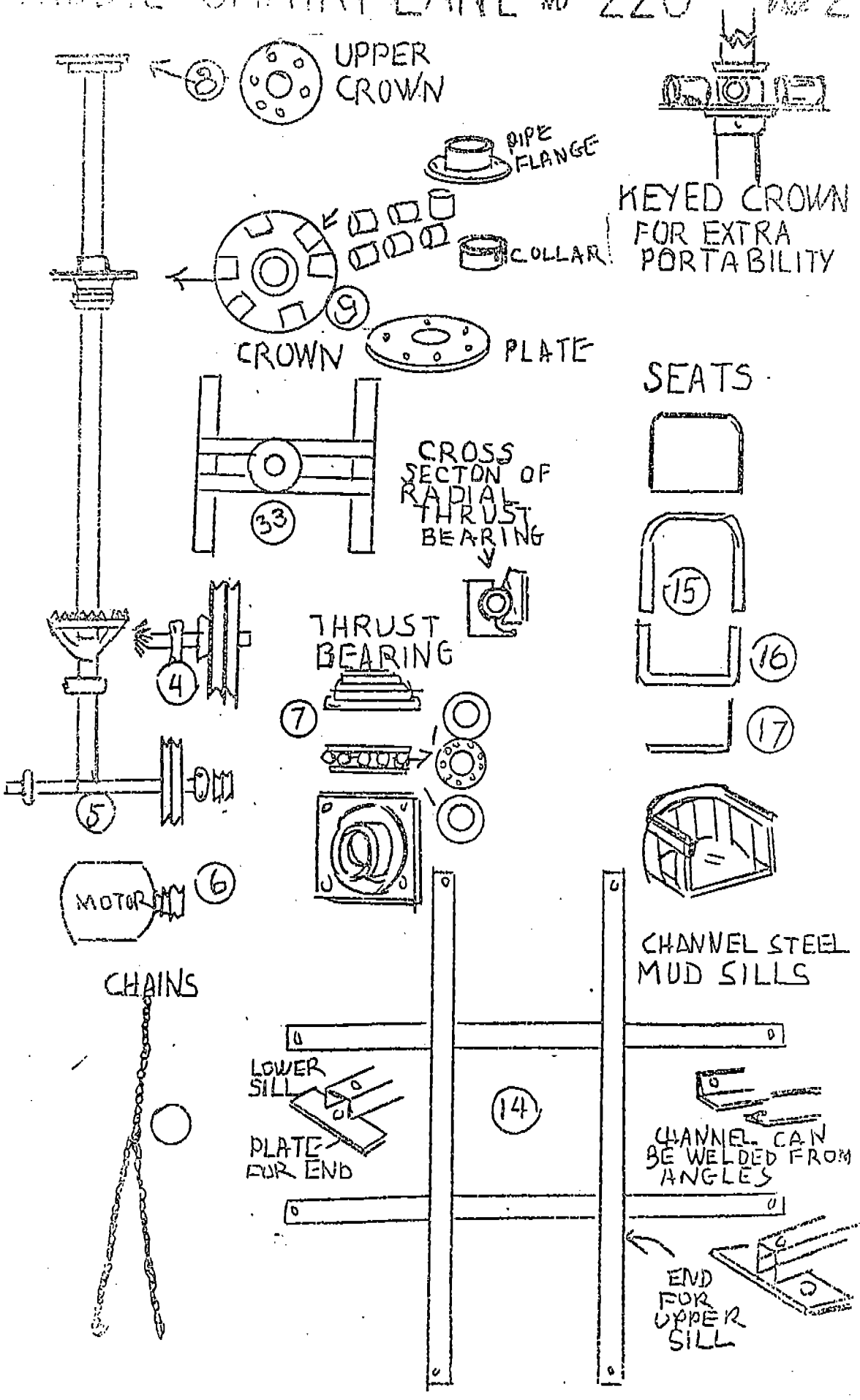
TICKET BOX

3 PANELS WITH 1x3" FRAMES MAKE UP A TICKET BOX. A SEAT CAN BE PLACED ON THE CROSS BAR, AND ANOTHER SET OF CROSS BARS CARRIES THE SHELF. TICKET BOX CAN BE 36"A TALL AND 30 " WIDE AND DEEP . FASTEN SECTIONS T OGETHER BY LOOSE PIN HINGES.

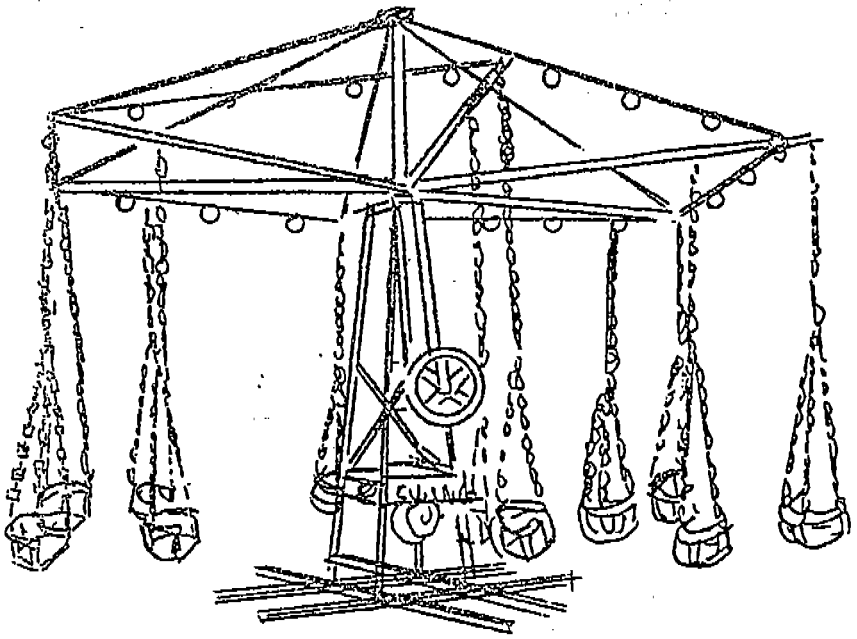
PAINT

PAINT YOUR RIDE WITH BRIGHT COLORS CONTRASTING ENAMELS. BE SURE EVERY PART IS WIPED CLEAN EACH DAY BEFORE YOU OPEN FOR BUSINESS. REMEMBER YOU ARE ONLY GIVING T: THE USE OF THE SEATS FOR THEIR MONEY. THE SURROUNDINGS SHOULB BE ATTRACTIVE.

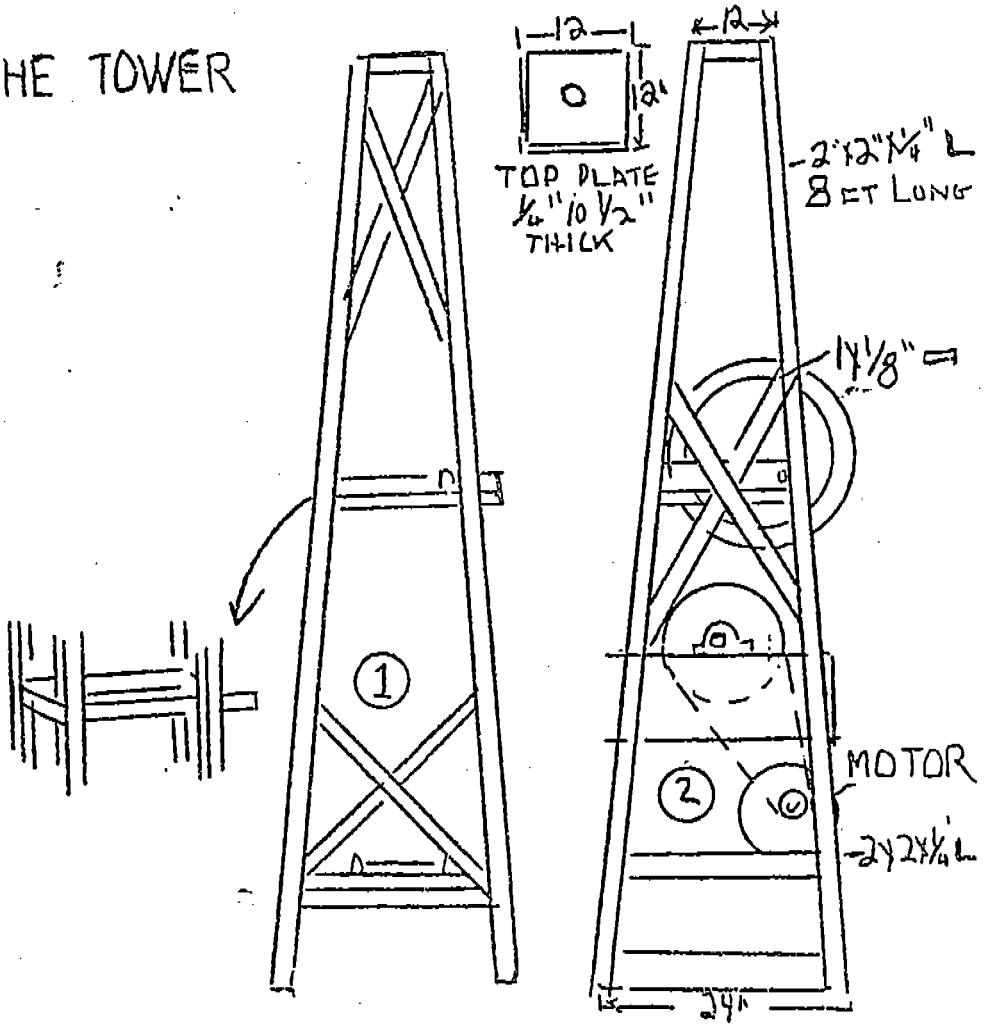
KIDDIE CHAIRPLANE CAT. NO 220



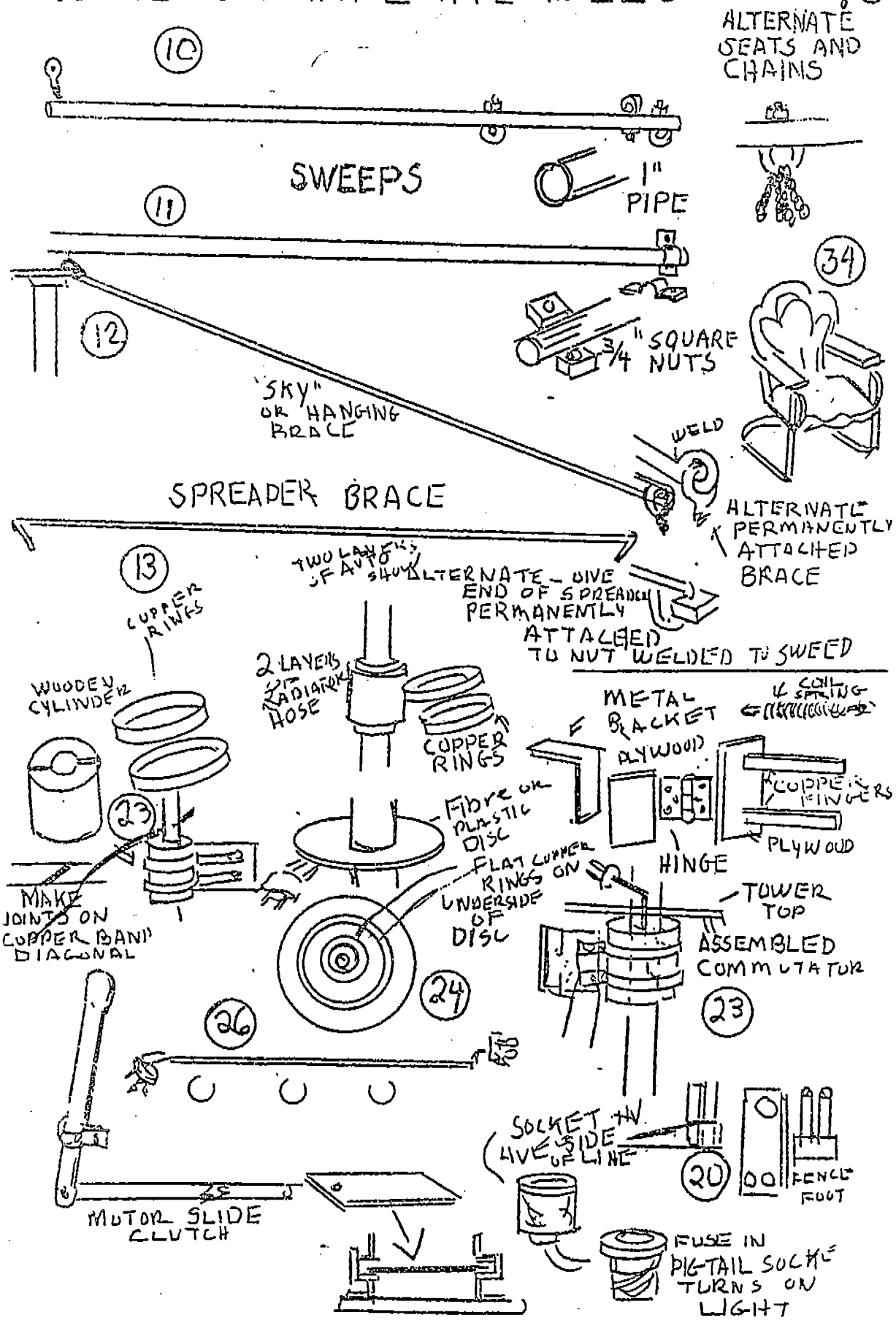
TRIPLE CHAIRPLANE-20'



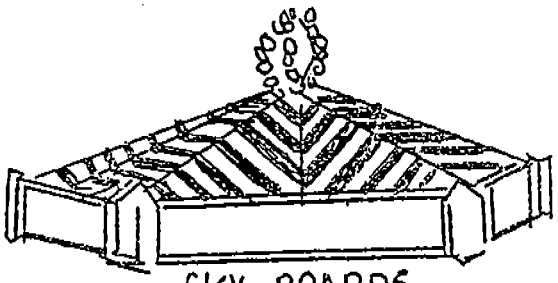
THE TOWER



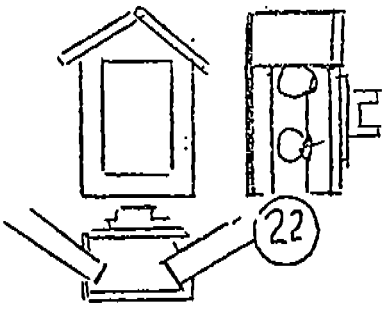
ADDIE CHAIRPLANE CAT. NO 220

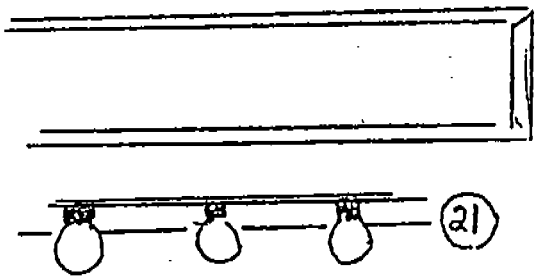


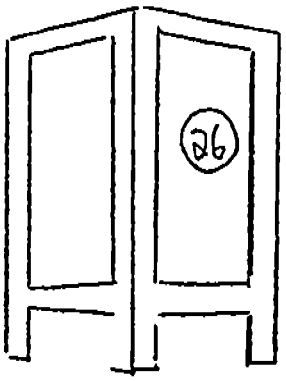
KIDDIE CHAIRPLANE CAT NO. 220



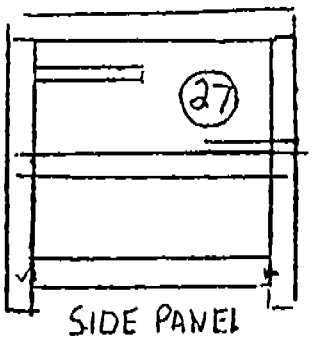
SKY BOARDS



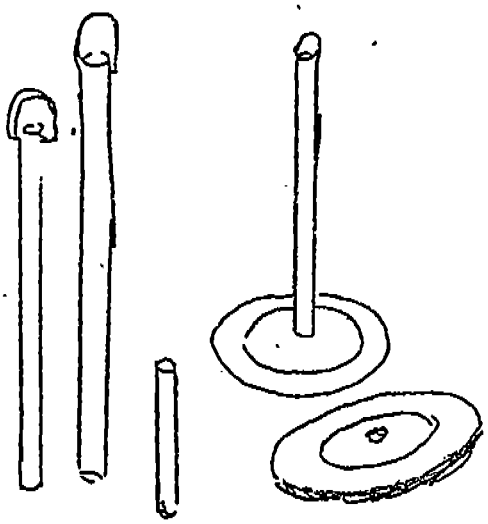


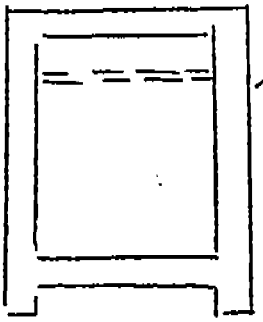


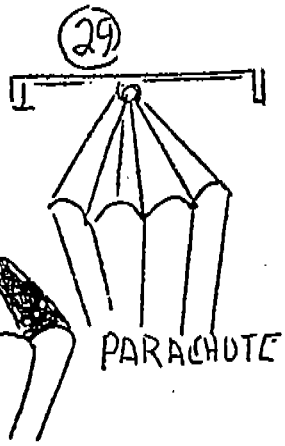
TICKET BOX



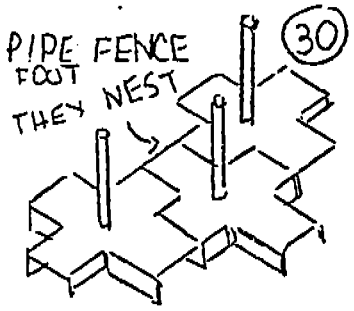
SIDE PANEL







PARACHUTE



SEE FIG 30 FOR FEET

FENCE SECTION