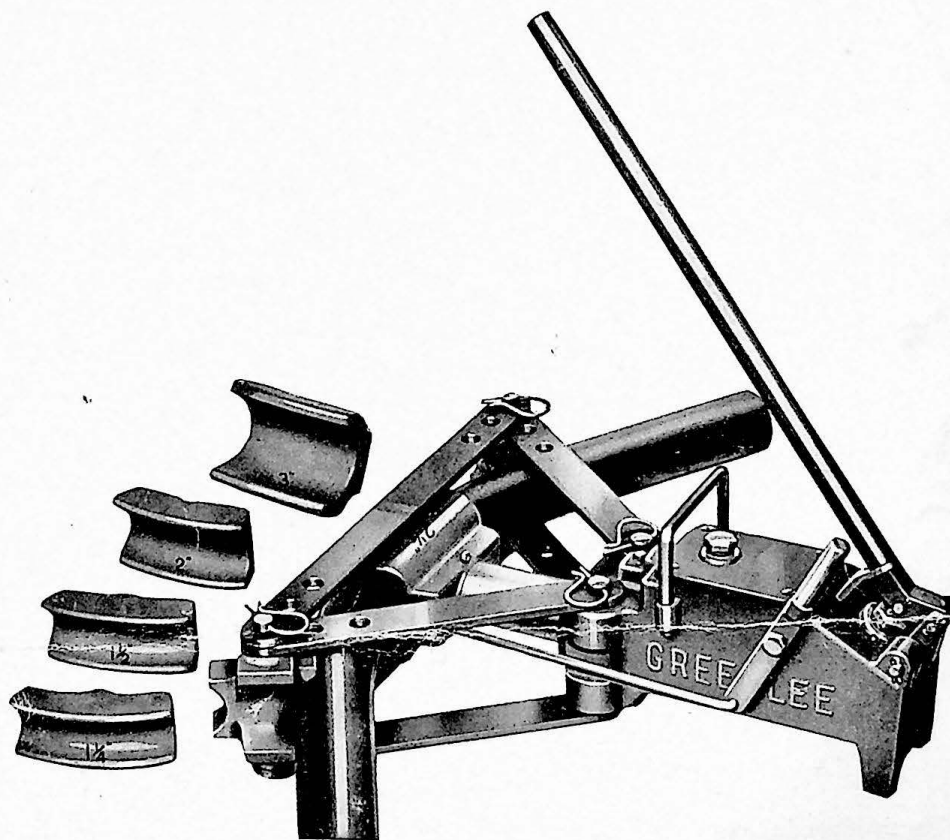


Instruction Bulletin
for **GREENLEE**
Hydraulic Conduit Benders
and Tie Squeezers



Manufactured and Guaranteed by
GREENLEE TOOL CO., Rockford, Illinois, U. S. A.
(DIVISION OF GREENLEE BROS. & CO.)

Operating Instructions

THE illustration on the front page of this folder shows an assembled Greenlee Hydraulic Conduit Bender, which will assist in placing the machine in proper condition for operation. To simplify boxing, all equipment such as bars, support castings, etc., have been packed separately from the power unit.

The No. 770 is regularly equipped to bend conduit ranging from $1\frac{1}{4}$ " to 3" and the No. 775 from 3" to $4\frac{1}{2}$ ". Each of the cross and connecting bars on both benders have a series of three holes drilled in them. Each hole is marked to indicate the position in which various sizes of conduit are to be bent. The outside holes of the bars on the No. 770 are for 3" and $2\frac{1}{2}$ " pipe, the next set of holes for 2" and $1\frac{1}{2}$ ", and the third for $1\frac{1}{4}$ ". The outside holes on the No. 775 are for $4\frac{1}{2}$ ", 4" and $3\frac{1}{2}$ " conduit, the next set for 3", also for $2\frac{1}{2}$ " if desired. The third position on the No. 775 is left unmarked and should only be used when smaller sizes of conduit are bent in this machine.

Both benders are fitted with support castings made with four concave sides, each marked with the size of conduit it will accommodate. On the No. 770 Bender, 3", $2\frac{1}{2}$ ", and 2" conduit have individual concave sides marked with these numbers, while the fourth side, marked with figures $1\frac{1}{2}$ " and $1\frac{1}{4}$ ", will take care of both of these sizes. On the No. 775 each size of conduit is supported by individual sides. When required, support castings can be furnished for the No. 775 to take $1\frac{1}{4}$ ", $1\frac{1}{2}$ ", 2" and $2\frac{1}{2}$ " conduit.

To prevent flattening and distortion of the conduit during the bending process, pressure is applied through a shoe which has the proper radius to fit the conduit. The shoes for each bender are packed in a box. Each shoe is marked for the size of conduit it is to handle. These shoes are fastened to the end of the piston by means of a cotter pin.

The release stop block is located directly below the injector lever. When the stop block is in a downward position, pumping action will force oil into the cylinder, exerting bending pressure. To release pressure give stop block a quarter turn to the right or left and force handle to its lowest possible position. This opens a valve in the injector, which permits the piston to be drawn back or extended by using the convenient return attachment located on the left-hand side of the power unit. The handle supplied fits both injector and return levers.

The No. 770 Bender has a maximum stroke of $5\frac{1}{4}$ " and the No. 775, $6\frac{1}{4}$ ". Extreme bends, therefore, cannot be made in one stroke and different settings for bending conduit are necessary. For instance, a 90 degree bend in a 3" piece requires five settings, which take about 15 minutes or less, depending upon the operator. (See page 3 for data on angles of shoes.) In resetting the conduit, be sure that the shoe is so placed that each end is equidistant from the conduit. This prevents side strain and permits pressure being evenly applied.

The reservoir of each bender, located at the top of the power unit, is filled with the proper amount of oil at time of shipment. The capacity of the No. 770 is one quart, the No. 775 two quarts, and either reservoir should never be less than half full. When replacement of oil becomes necessary, purchase a high grade hydraulic oil. If this is not obtainable, it can be supplied by us in gallon containers.

The plug in the reservoir cover has a double vent to permit intake of air when pressure is being developed and to allow escape of air as pressure is released. Two holes in the sides of this plug leading to the intake and exhaust valves should always be kept clean.

Bending Data for No. 770 and No. 775 Machines

The table printed on the opposite page will enable the operator of Greenlee Hydraulic Conduit Benders to determine the length of conduit required for various offsets as well as the number of degrees of bend required for certain clearances. The piston travel given above is, of course, computed after the shoe has come in contact with the conduit.

For example, to secure a 10-inch offset with $1\frac{1}{4}$ -inch conduit, $17\frac{5}{8}$ inches of conduit will be required. To determine this, figure as follows: Dimension "C" is constant, remaining always $6\frac{3}{8}$ inches for this size conduit. Add to this the conduit required to make the

two bends "D." $1\frac{1}{8}$ inches of this size conduit is required for each 10 degrees of bend, and in making a 10-inch offset the two bends will be at an angle of 50 degrees. On this basis, $55\frac{5}{8}$ inches will be required for each bend "D" or $11\frac{1}{4}$ inches for both, which added to $6\frac{3}{8}$ inches gives $17\frac{5}{8}$ inches.

The table also gives the angles of the shoes. For example, take the 2 inch size which has a 40 degree shoe angle. After the shoe has come in contact with the conduit and the piston has traveled $2\frac{1}{8}$ inches, the shoe is completely filled with conduit, the result being a bend of 40 degrees. In making a 45 degree

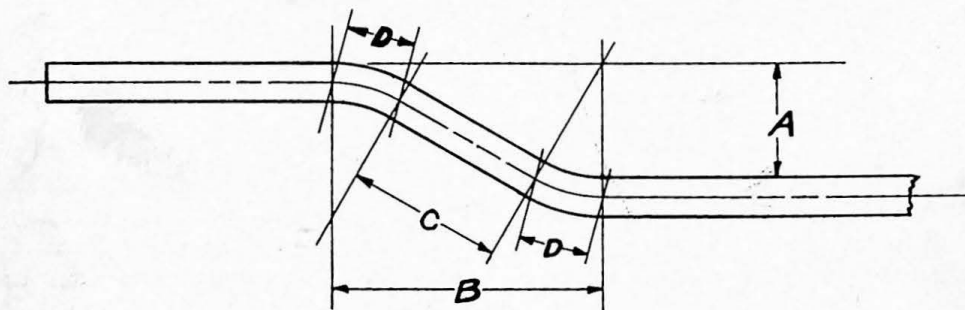
bend, the conduit must be shifted to the right the width of the shoe, then another piston stroke of $\frac{5}{16}$ inches made to give the additional 5 degrees. To make a 90 degree bend, two extra shifts of conduit are necessary, three in all. The second shift with a $2\frac{1}{8}$ inch piston travel will give an additional 40 degrees or a total of 80 degrees. After the next shift, a $\frac{5}{8}$ inch travel of the piston will give the 10 degrees required to make a full 90 degree bend.

The above holds true as far as the other sizes are concerned also. Please note that the $1\frac{1}{4}$ -inch shoe has an angle of 56 degrees. Two settings of this size are necessary to secure a 90 degree bend, using a $2\frac{1}{16}$ -inch stroke to secure 50 degrees, and on the second shift, a $1\frac{3}{4}$ -inch stroke to give the additional 40 degrees. The $1\frac{1}{2}$ -inch size requires three settings, bending 30 degrees each time, using $1\frac{7}{8}$ -inch piston

stroke; the $2\frac{1}{2}$ -inch requires three settings, bending 30 degrees each time, using $2\frac{3}{16}$ -inch stroke; the 3-inch, $3\frac{1}{2}$ -inch, 4-inch and $4\frac{1}{2}$ -inch require five settings, making four bends at 20 degrees and the fifth at 10 degrees using the piston travels given above.

The safety valve provided in the under side of the power unit will blow out at a pressure exceeding 50,000 pounds on the No. 770 and 80,000 pounds on the No. 775. When this occurs, unscrew the plug and insert a new copper disk the same diameter and thickness of a penny. Be sure and tighten plug securely to eliminate leakage of oil at this point.

DO NOT OPERATE MACHINE AFTER THE SHOE HAS BEEN COMPLETELY FILLED WITH CONDUIT AS KINKING AND DISTORTION WILL RESULT.



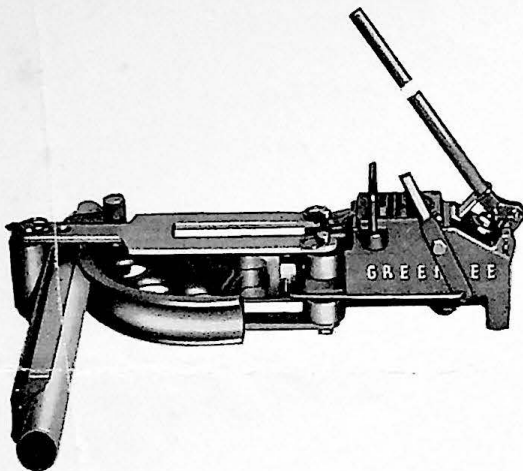
OFFSETS OBTAINABLE

SIZE	1 1/4"			1 1/2"			2"			2 1/2"			3"			3 1/2"			4"			4 1/2"		
SHOE RADIUS	6 1/4"			7 3/4"			8 5/8"			10 1/2"			13"			15"			16"			17"		
SHOE ANGLE	56°			45°			40°			32°			26°			22°			20°			19°		
ANGLE OF BEND	A	B	PISTON TRAVEL	A	B	PISTON TRAVEL	A	B	PISTON TRAVEL	A	B	PISTON TRAVEL	A	B	PISTON TRAVEL	A	B	PISTON TRAVEL	A	B	PISTON TRAVEL	A	B	PISTON TRAVEL
10°	1 1/2	9	17/32	1 3/4	11 1/4	1 1/16	1 3/4	11 1/2	5/8	2	14	13/16	2 1/4	15	13/16	2 1/2	17 1/4	15/16	2 3/4	18	15/16	2 3/4	18 1/4	15/16
20°	3	11	1	4	13 1/4	1 5/16	4	14 1/2	1 1/4	5	17 1/2	1 9/16	5 1/4	19 1/2	1 1/2	6	22 1/2	1 3/4	6 1/4	23 1/2	1 3/4	6 1/2	24 1/4	1 1/16
30°	5	12 1/2	1 3/8	6 1/2	16	1 7/8	6 3/4	17	1 3/4	8 1/4	20 1/2	2 3/16	9	23 1/4		10 1/2	27		10 3/4	28 1/4		11	29 1/2	
40°	7 1/2	14	1 3/4	9 1/2	17 1/2	2 5/16	9 3/4	19	2 1/8	12	23		13 1/4	26 3/4		15 1/2	30 3/4		16	32 1/4		16 1/2	34	
50°	10	15	2 1/16	12 1/2	18 3/4		13 1/4	20 1/4		16	24 1/2		18	29		21	33 1/2		22	35 1/2		22 3/4	37 1/4	
60°	12 1/2	15 1/2		15 3/4	19 1/4		16 3/4	21		20 1/2	25 1/2		23 1/4	31 1/2		27	35 1/4		28 1/2	37 1/2		29 1/2	39 1/2	
70°	15	15 1/2		19 1/4	19 1/4		20 1/2	21 1/4		25	26		28 1/2	31 1/4		33 1/2	36		35	38 1/4		36 1/2	40 1/2	
80°	18	15		22 1/2	18 1/2		24 1/4	20 3/4		29 1/2	25 1/4		34	30 3/4		39 1/2	35 1/2		41 1/2	38		43 1/2	40 1/2	
90°	20 1/2	14		25 3/4	17 1/2		27 3/4	19 1/2		33 1/2	23 3/4		39 1/2	29 1/2		45 1/2	34		48	36 1/2		50 1/2	39	
C	6 3/8"			8 1/8"			8 1/8"			9 7/8"			9 7/8"			11 5/8"			11 5/8"			11 5/8"		

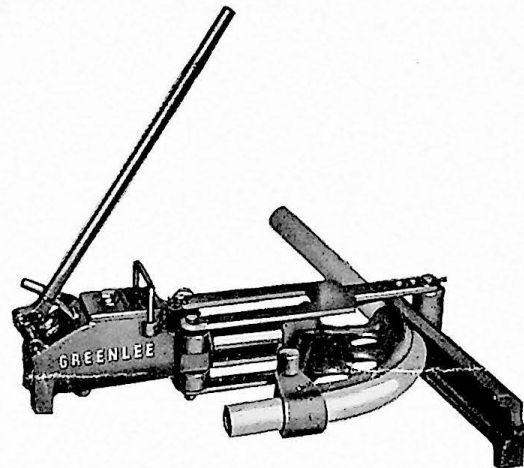
LENGTH OF CONDUIT REQUIRED FOR EACH 10° OF BEND.

D	1 1/8"	1 3/8"	1 1/2"	1 7/8"	2 1/4"	2 5/8"	2 3/4"	3"
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Assembly and Operating Instructions for No. 770-T Greenlee Hydraulic Thin-Wall Steel Conduit Bender



No. 770-T showing the position of the shoe, conduit and follow bar at the beginning of the bend.



No. 770-T showing the position of the shoe, conduit and follow bar when the bend has been completed.

The illustrations above show the No. 770-T Hydraulic Thin-Wall Conduit Bender properly assembled. Fittings, which are packed loose in shipping container, should be attached to the power unit in accordance with the illustrations to permit the proper operation of the machine.

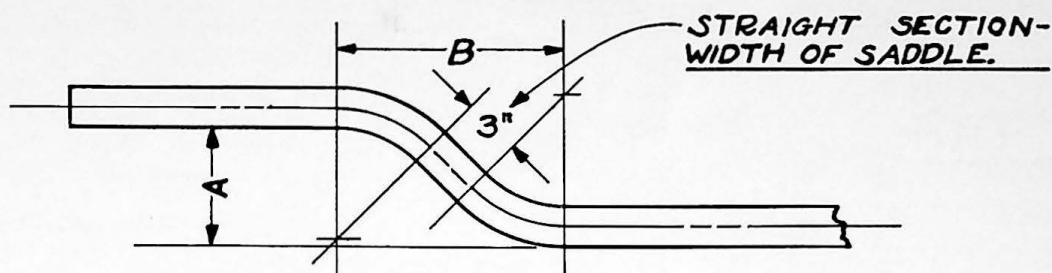
This machine will handle $1\frac{1}{4}$ ", $1\frac{1}{2}$ ", and 2" thin-wall steel tube conduit. One roller supports the follow bar and shoe in the bending operation, and this roller must be placed properly for the various sizes. The connecting bars have three holes in each for insertion of a pin to hold the roller. To bend $1\frac{1}{4}$ ", the roller should be held by the pin inserted in the holes nearest the body; to bend $1\frac{1}{2}$ ", use the middle holes; and to bend 2", use the holes farthest from the body.

To set up the machine for bending, first place roller (AA937) in the proper position, as explained in preceding paragraph. Next place proper follow bar (AV753 for $1\frac{1}{4}$ ", AV752 for $1\frac{1}{2}$ ", AV744 for 2") against the roller. The follow bars have lugs at each end for contact with the floor, permitting proper line-up with balance of machine. The shoe (AV750 for $1\frac{1}{4}$ inch, AV749 for $1\frac{1}{2}$ inch, AV742 for 2 inch) should then be attached to the large piston by means of the cast yoke (AV801), which is fastened with a knurled-head pin.

Next place steel tube conduit in groove of shoe and attach proper saddle (AV777 for $1\frac{1}{4}$ inch, AV775 for $1\frac{1}{2}$ inch, AV778 for 2 inch), fastening with knurled-head saddle pin. The saddle forces the conduit to follow the contour of the shoe when undergoing the bending operation. By means of the return attachment on the left-hand side of power unit, bring the conduit in the shoe in contact with follow bar, being sure that edges of the shoe fit into grooves of the follow bar. A proper set-up results in the saddle being adjacent to the right end of the follow bar, but not in contact with the roller.

After the set-up has been made, the appearance of the machine will be in accordance with the illustration shown to the left above. The bending operation can then be started, and as power is applied, the shoe and follow bar will swing to the right. The follow bar always supports the conduit at the point of pressure, preventing kinking and distortion. When the contour of the shoe has been completely filled with the conduit, a 90 degree bend has been made, and pressure should then be released. (See right-hand illustration shown above.) If additional pressure is applied after the contour of the shoe has been completely filled, kinking will result. After releasing the pressure, return the piston by using the return attachment and remove the saddle, which will permit the conduit to be taken from the machine.

Bending Data for No. 770-T



OFFSETS OBTAINABLE					
TRAVEL OF PISTON.		1"	2"	3"	4"
DIMENSION "A" FOR	1 1/4"	2 3/8"	6 1/2"	10 7/8"	16 3/4"
	1 1/2"	2 1/2"	7"	11 3/4"	17 1/2"
	2"	2 5/8"	7 3/4"	12 1/8"	19"
DIMENSION "B" FOR	1 1/4"	10 1/2"	13 1/2"	15 1/2"	15 3/4"
	1 1/2"	12"	16 1/4"	17 3/4"	18"
	2"	13"	17 1/2"	20 1/4"	22 1/4"
ANGLE OF BEND.		20°	40°	60°	80°

The piston of the No. 770-T has a maximum stroke of about 5 1/4 inches, although in bending thin-wall steel conduit, a stroke longer than 4 1/2 inches is unnecessary. Every 1/2-inch movement of the piston results in a 10 degree bend for this type of conduit, and applies to all three sizes handled by this bender, namely 1 1/4, 1 1/2 and 2-inch. In other words, a piston movement of 2 1/4 inches results in a 45 degree bend, and a 4 1/2 inch movement in a 90 degree bend.

The radius of the 1 1/4-inch shoe is 6 1/2 inches, the 1 1/2-inch is 7 1/4 inches and the 2-inch is 8 1/4 inches.

The drawing and table printed above give information regarding offsets which can be made with the No. 770-T machine. In giving exam-

ples of offsets, we have used piston strokes of 1, 2, 3, and 4-inch, resulting in bends of 20, 40, 60 and 80 degrees respectively. This table will enable the operator to determine the piston movement necessary for various offsets, eliminating experiments and waste of conduit.

In making an offset in this machine, two settings of the conduit are necessary. For example, to make a 6-inch offset in 1 1/2-inch thin-wall steel conduit, a piston movement of 2 inches will be required. This will result in a bend as per illustration "A" given below. After the first bend has been completed, the machine should be reset, and the conduit revolved as per illustration "B." Then extend piston 2 inches again which completes the second bend of the offset.

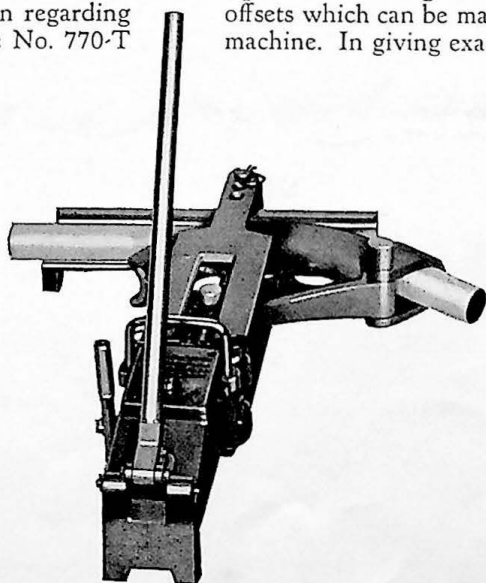


Illustration "A"

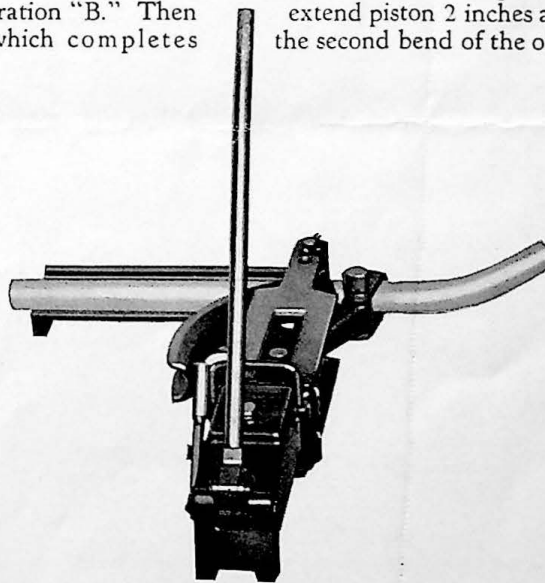
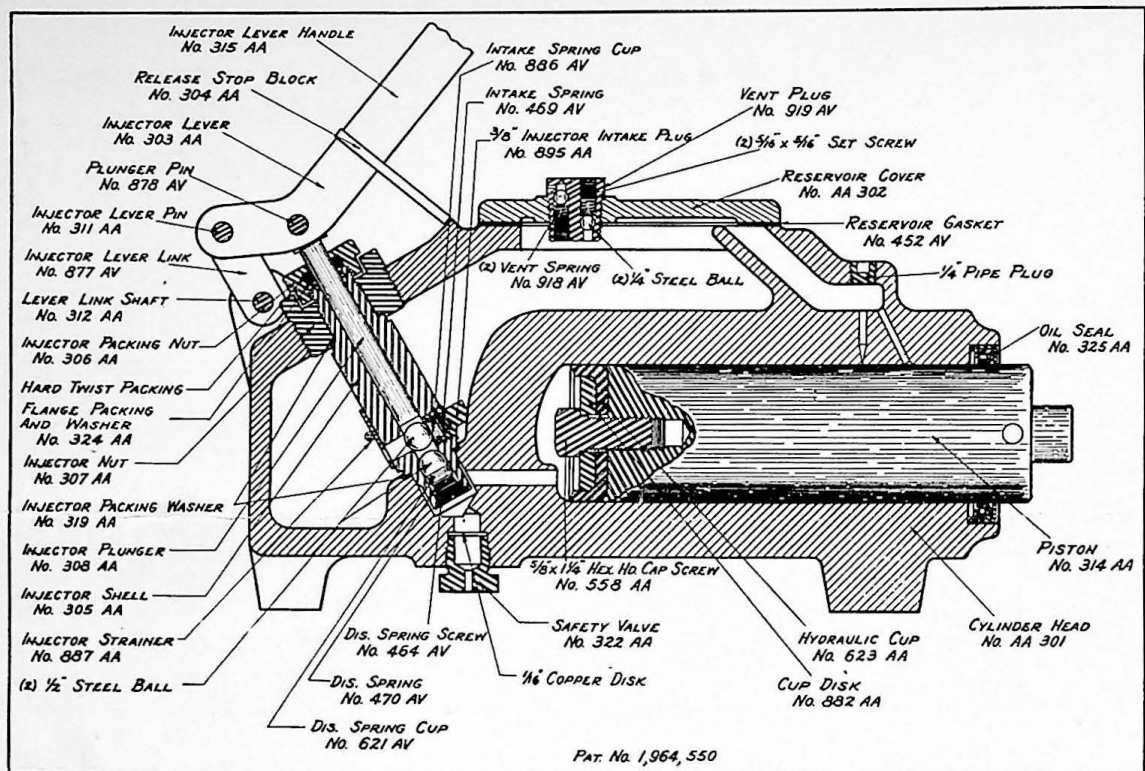
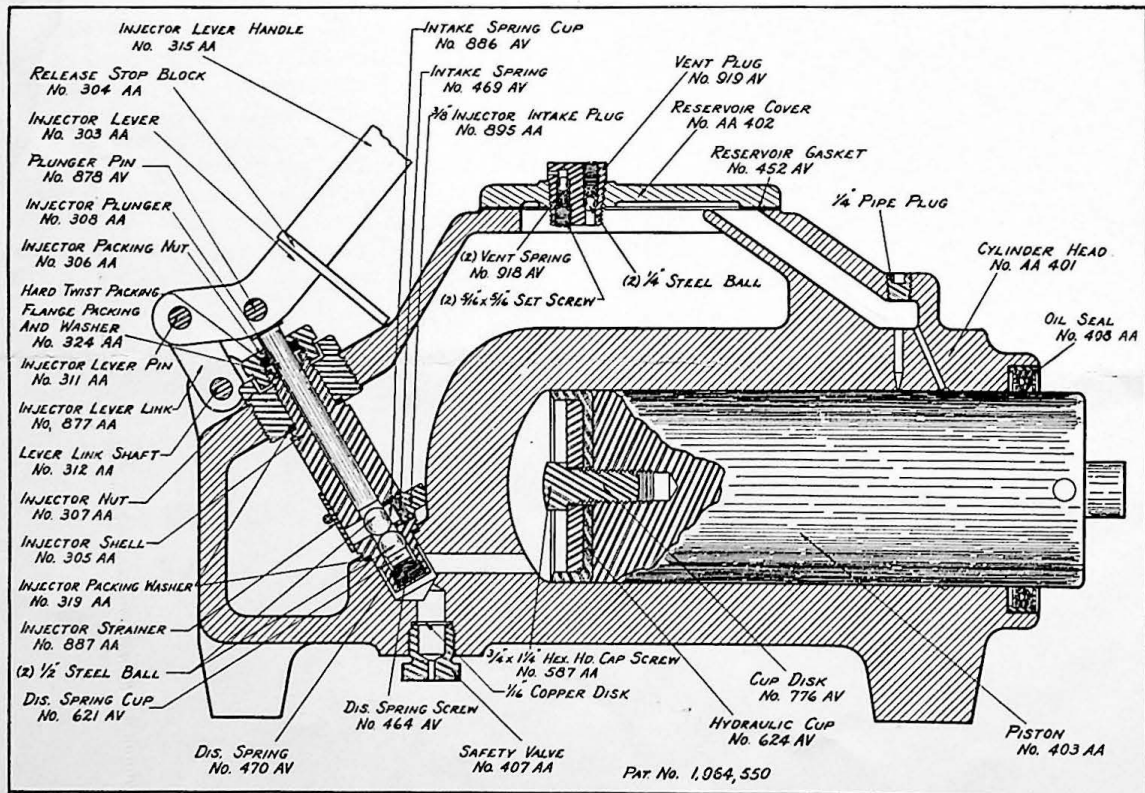


Illustration "B"



Cross section view of Power Unit for Model Nos. 770, 770-T and 771.



Cross section view of Power Unit for Model No. 775

Power Unit Servicing Instructions

Dirt or grit in the valves of the injector will prevent the proper operation of the bender. To remove the injector, take out the plunger pin (878AV), fold injector lever back, and unscrew injector nut (AA307) with spanner wrench. The injector can then be taken out of machine through opening in casting.

To clean the injector, take out the steel balls, springs and spring cups by unscrewing the exhaust spring stop screw (AV464) and the intake plug (AA895). Wash all parts and the inside of the shell thoroughly with gasoline. If seats of valves are worn do not reseat by drilling as this destroys their relative position. Reseating should be done by tapping the balls with a hammer, using a soft metal rod for reach.

When replacing the steel ball, exhaust spring cup (AV621), and exhaust spring (AV470), tighten the stop screw (AV464) enough to give the exhaust spring sufficient tension to hold the steel ball in its proper place. In replacing the intake spring (AV469), spring cup (AV886), and the steel ball, screw on intake plug (AA895) until it is tight.

The reservoir of the machine should be thoroughly cleaned before injector is inserted, which can be easily done by removing cover. Before replacing injector, place packing washers (AA319) over the

upper and lower ends. Insert the injector in the socket of the cylinder head, the intake opening facing the lower end of the reservoir. Then screw on and tighten the injector nut (AA307) securely with spanner wrench.

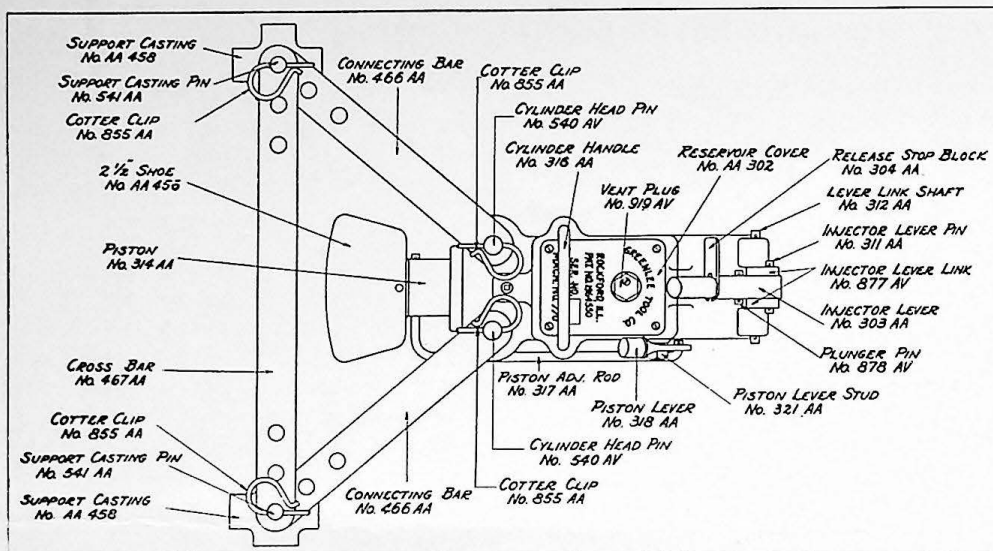
It is advisable to repack the injector plunger (AA308) after the injector has been cleaned. To do this unscrew the injector packing nut (AA306), take out plunger and remove old packing. Place one flange leather packing and washer (AA324) and three single coils of 1/8" braided packing around plunger, insert plunger into injector and screw on injector packing nut as tightly as possible. Complete the assembly by inserting plunger pin (AV878). Refill reservoir with new clean oil as outlined on page 2.

A worn Neoprene cup will cause loss of pressure. To replace it, the piston must be pulled out of the machine, and this can be done easily without disturbing the oil seal, after piston adjusting rod has been disconnected. Place the leather washer, which acts as a lubricator, between the Neoprene cup and the piston. Do not draw the holding screw too tight, as this will distort the neoprene cup. Merely tighten to keep the cup from being turned by hand. When replacing the piston, be sure that it is clean and that the wall of the cylinder is free from dirt.

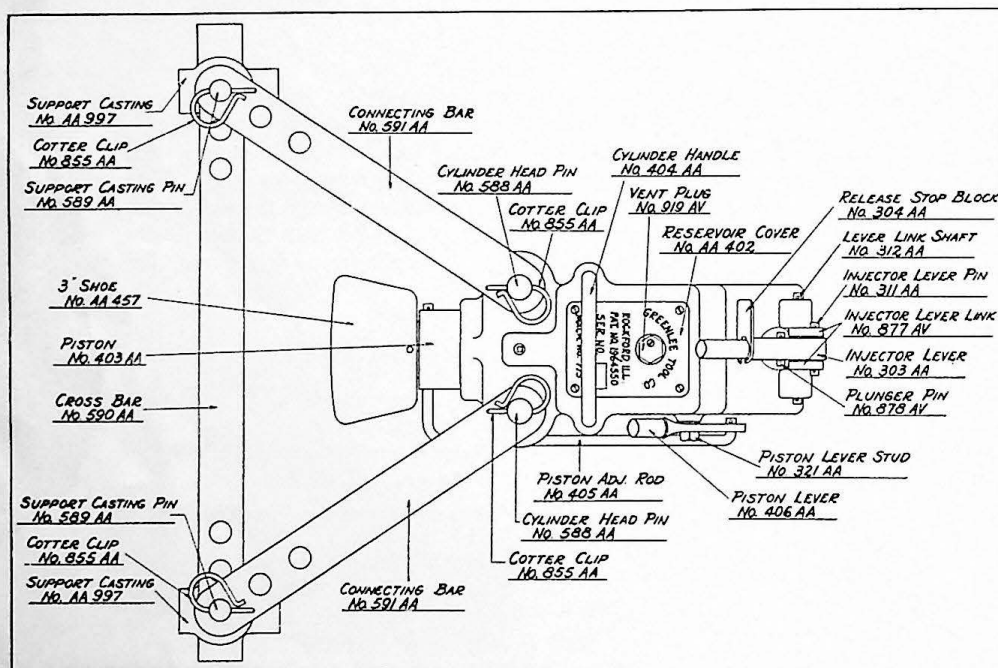
Price List of Parts for Power units

Part No.	Each	Part No.	Each
AA303 Injector Lever.....	\$ 4.00	Injector assembly complete with plunger, packing and injector nuts.....	13.50
AA304 Release Stop Block.....	.75	Above parts common for Nos. 770, 770-T, 775.	
AA305 Injector Shell.....	6.00	AA317 Piston Adjusting Rod, complete with AA318 Piston Lever and AA321 Stud for Nos. 770 and 770-T.....	3.75
AA306 Injector Packing Nut.....	1.50	AA322 Safety Valve for Nos. 770 and 770-T.....	1.00
AA307 Injector Nut.....	2.00	AA325 Oil Seal for Nos. 770 and 770-T.....	1.00
AA308 Injector Plunger.....	2.00	AA558 Cup Retaining Screw for Nos. 770 and 770-T.....	.20
AA311 Injector Lever Pin.....	.20	AA623 Neoprene Cup and Leather Washer for Nos. 770 and 770-T.....	2.00
AA312 Lever Link Shaft.....	.25	AA882 Cup Disk for Nos. 770 and 770-T.....	1.70
AA315 Injector Lever Handle.....	1.00	AA405 Piston Adjusting Rod complete with AA406 Piston Lever, and AA321 Stud for No. 775.....	4.35
AA319 Injector Packing Washers, 2 required.....	.10	AA407 Safety Valve for No. 775.....	1.00
AA324 Flange Leather Plunger Packing and Washer	.10	AA408 Oil Seal for No. 775.....	1.60
AV452 Reservoir Gasket.....	.10	AA587 Cup Retaining Screw for No. 775.....	.30
AV464 Discharge Spring Screw.....	.35	AV624 Neoprene Cup and Leather Washer for No. 775.....	3.00
AV469 Intake Spring.....	.10	AV776 Cup Disk for No. 775.....	1.80
AV470 Discharge Spring.....	.10	ALWAYS SPECIFY STYLE NUMBER AND SERIAL NUMBER OF MACHINES FOR WHICH PARTS ARE ORDERED	
AV621 Discharge Spring Cup.....	.20		
AV877 Injector Lever Links, 2 required.....	.35		
AV878 Plunger Pin.....	.20		
AV886 Intake Spring Cup.....	.20		
AA1109 Intake Spring Plunger.....	.20		
AV895 Intake Injector Plug.....	.35		
AA1110 Intake Plug with AA1112 Washer.....	.35		
AV919 Vent Plug Complete.....	2.25		

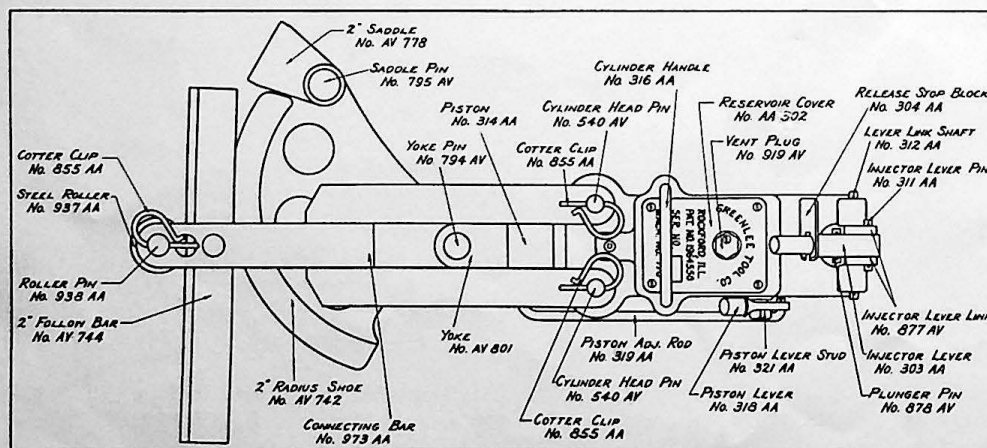
NOTE: New AA1110 Intake Plug, with AA1112 Washer, and AA1109 Intake Spring Plunger are now used on all No. 770 Benders with serial No. 2816 and up, and No. 775 Benders with serial No. 6400 and up, in place of the AV895 Intake Injector Plug and AV886 Intake Spring Cup.



Top view of No. 770
with equipment.



Top view of No. 775
with equipment.



Top view of No. 770-T
with equipment.

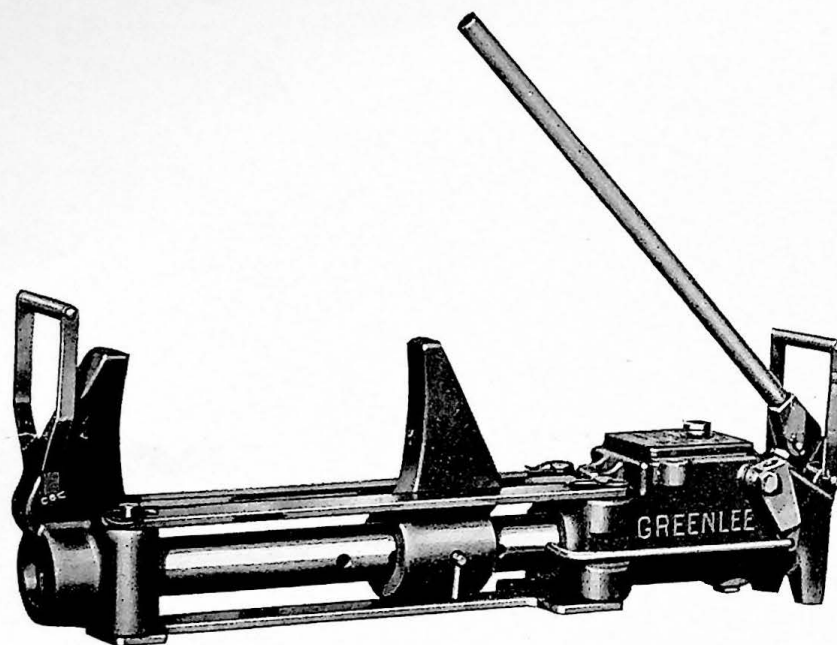
Price List of Equipment Parts

Part No.	Each
AA453 1 1/4" Shoe for No. 770.....	\$ 4.00
AA454 1 1/2" Shoe for No. 770.....	5.00
AA455 2" Shoe for No. 770.....	6.00
AA456 2 1/2" Shoe for No. 770.....	8.00
AA457 3" Shoe for Nos. 770 and 775.....	9.00
AA458 Support Castings for No. 770, 2 required.....	5.00
AA466 Connecting Bars for No. 770, 4 required.....	1.85
AA467 Cross Bars for No. 770, 2 required.....	2.40
AV540 Cylinder Head Pins for No. 770, 2 required.....	1.00
AA541 Support Casting Pins for No. 770, 2 required.....	.80
AA855 Cotter Clips for all machines.....	.10
AA997 Support Castings for No. 775, 2 required.....	7.00
AA567 3 1/2" Shoe for No. 775.....	11.50
AA568 4" Shoe for No. 775.....	14.00
AA593 4 1/2" Shoe for No. 775.....	15.00
AA588 Cylinder Head Pins for No. 775, 2 required.....	1.25
AA589 Support Casting Pins for No. 775, 2 required.....	1.00
AA590 Cross Bars for No. 775, 2 required.....	3.50
AA591 Connecting Bars for No. 775, 4 required.....	3.00
AV750 1 1/4" Shoe for No. 770-T.....	12.00
AV749 1 1/2" Shoe for No. 770-T.....	14.00
AV742 2" Shoe for No. 770-T.....	17.00
AV753 1 1/4" Follow Bar for No. 770-T.....	14.00
AV752 1 1/2" Follow Bar for No. 770-T.....	16.00
AV744 2" Follow Bar for No. 770-T.....	19.00
AV777 1 1/4" Saddle for No. 770-T.....	2.00
AV775 1 1/2" Saddle for No. 770-T.....	2.25
AV778 2" Saddle for No. 770-T.....	2.50
AV801 Yoke for No. 770-T.....	7.00
AA973 Connecting Bars for No. 770-T, 2 required.....	7.00
AA937 Steel Roller for No. 770-T.....	4.00
AV794 Yoke Pin for No. 770-T.....	1.50
AV795 Saddle Pin for No. 770-T.....	2.00
AA938 Roller Pin for No. 770-T.....	1.00

THE GREENLEE GUARANTEE

Greenlee Hydraulic Conduit Benders will be serviced free of charge for a period of 90 days after receipt by user, provided they have been operated in accordance with instructions furnished. In addition to this, non-wearing parts are guaranteed against defects of material and workmanship. Machines requiring service after the ninety day period, will be completely reconditioned at a labor charge of \$5.00 plus costs of parts and transportation.

Operating Instructions for No. 771 Hydraulic Tie Squeezer



No. 771 Hydraulic Tie Squeezer

No assembly instructions are necessary for this machine as it is completely assembled prior to shipment and it is received by the purchaser ready for operation. The power unit of this machine is the same, with the exception of the piston and handle levers, as employed for the No. 770 Hydraulic Conduit and Pipe Bending Machine and on page 6 we show a cross section view for identification of inside parts. Servicing instructions on page 7 also apply to this power unit.

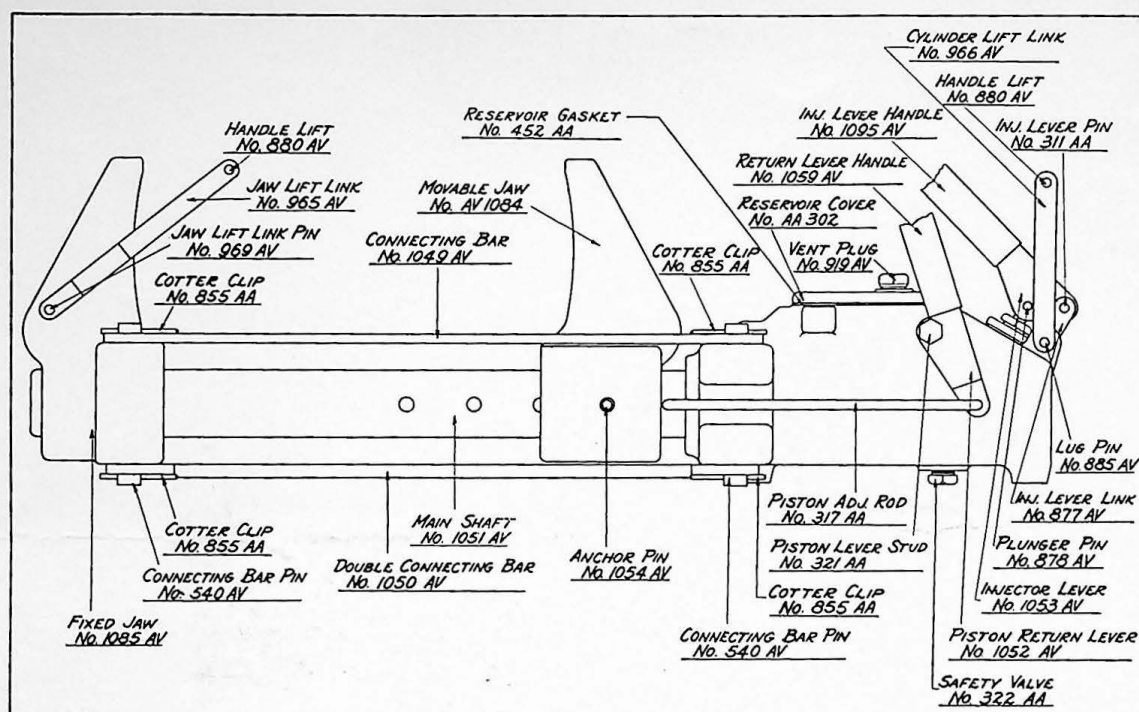
Pressure is developed by using a normal stroke of the injector handle. By depressing the injector handle to its lowest possible position, pressure is released, and in this position the piston can be drawn back or extended by using the return attachment mounted on the left-hand side of the power unit. The maximum piston stroke of the machine is $5\frac{1}{4}$ ".

The reservoir located at top of the power unit has a capacity of one quart, and it is filled with proper amount of oil at time of shipment. The reservoir should never be less than half full and when replacement of oil is necessary, purchase a high grade hydraulic oil. The vent plug in the reservoir cover permits intake and exhaust of air and the holes in its side which lead to the valves should be kept clean.

A safety valve is provided in the under side of the power unit which will blow out at a pressure exceeding 50,000 pounds, preventing damage to the machine and equipment. When blow out occurs, unscrew plug and insert a copper disk the same diameter and thickness of a penny. Be sure that plug is securely tightened to eliminate leakage of oil at this point.

The machine has range for squeezing ties and timbers up to 15" in width, and both jaws clear the bars by approximately 7". The piston or main shaft of the machine has a series of four holes for setting the movable jaw to take care of various widths. The jaw can be easily set in desired position by sliding it along the main shaft and locking by means of a pin.

Ordinarily the machine is shipped assembled with jaws in upright position for squeezing checked ties and timbers in yard work. In this position the two individual connecting bars are used at the top and the double connecting bar at the bottom. The jaws of the machine can be reversed for squeezing ties in the road bed, and in handling work of this kind, it is also necessary to reverse the bars, that is, placing the two individual bars at the bottom and the double connecting bar at the top.



Side view of No. 771, showing part numbers.

Price List of Parts for No. 771 Tie Squeezer

Part No.	Each	Part No.	Each
AV1053 Injector Lever.....	\$ 6.00	AV452 Reservoir Gasket.....	.10
AA305 Injector Shell.....	6.00	AV540 Connecting Bar Pins, 4 required.....	1.00
AA306 Injector Packing Nut.....	1.50	AA855 Cotter Clips.....	.10
AA307 Injector Nut.....	2.00	AA558 Cup Retaining Screw.....	.20
AA308 Injector Plunger.....	2.00	AA623 Neoprene Cup and Leather Washer.....	2.00
AA311 Injector Lever Pin.....	.20	AA882 Cup Disk.....	1.70
AA319 Injector Packing Washers, 2 required.....	.10	AV919 Vent Plug complete.....	2.25
AA324 Flange Leather Plunger Packing and Washer	.10	AV1049 Connecting Bars, 2 required.....	2.50
AV464 Discharge Spring Screw.....	.35	AV1050 Double Connecting Bar.....	6.50
AV469 Intake Spring.....	.10	AV1052 Piston Return Lever complete with AA317 Piston Adjusting Rod and AA321 Piston Lever Stud.....	7.75
AV470 Discharge Spring.....	.10	AV1054 Anchor Pin.....	.35
AV621 Discharge Spring Cup.....	.20	AV1059 Return Lever Handle.....	1.00
AV877 Injector Lever Links, 2 required.....	.35	AV1095 Injector Lever Handle.....	1.50
AV878 Plunger Pin.....	.20	AV1084 Movable Jaw.....	20.00
AV886 Intake Spring Cup.....	.20	AV1085 Fixed Jaw.....	24.00
AV895 Intake Injector Plug.....	.35		
Injector assembly complete with plunger, packing and injector nuts.....	13.50		
AA322 Safety Valve.....	1.00		
AA325 Oil Seal.....	1.00		

ALWAYS SPECIFY SERIAL NUMBER OF MACHINE
FOR WHICH PARTS ARE ORDERED

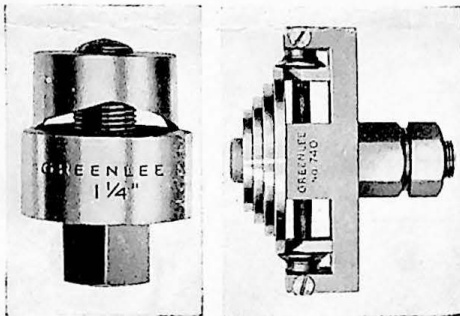
The No. 771 Hydraulic Tie Squeezer is subject to the same
guarantee as given on page 9 for all Hydraulic Benders.

THE GREENLEE LINE

In addition to Hydraulic Benders for standard and thin-wall steel conduit, the Greenlee line includes Knockout Punches and Cutters, Hydraulic Pipe Pushers, Joist Borers, Cable Pullers, Demolition Tools, Electricians' Bits, Bit Extensions, Expansive Bits, Spiral Screw Drivers, Automatic Push Drills, Wood Drills, Reamers, Countersinks, Brace Screw Driver Bits, Chisels, Gouges, Draw Knives and Turning Tools.

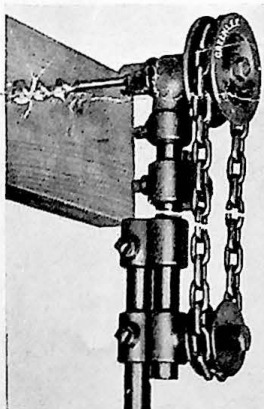
Descriptive matter on any of the above tools will be sent on request.

Some Examples of Greenlee Tools for the Electrician



Knockout Tools

Holes in outlet boxes, switch cabinets, etc., can be enlarged quickly and accurately with the tools shown above. Smooth holes are the result, without reaming or filing. Punches come in two sets and are provided with leather cases. The No. 735 set is for conduit from $\frac{1}{2}$ " to $1\frac{1}{4}$ ", while the No. 737 will enlarge holes for $1\frac{1}{2}$ " and 2" conduit. The No. 740 Cutter will enlarge holes for all sizes from $1\frac{1}{2}$ " to 3".



Ball-Bearing Joist Borer

Here is a joist borer that will drive bits up to $1\frac{1}{4}$ " and is easy to operate, because of its ball-bearing construction. Round links for the chain make it easy on the hand. It is light, but sturdy, and all parts come packed in a small box for quick assembly on two pieces of $\frac{1}{2}$ " conduit.



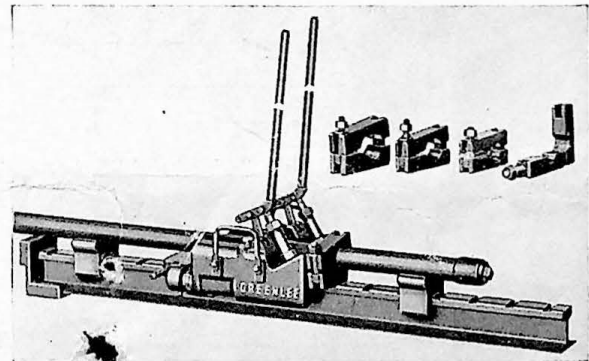
No. 16 Unispur Electricians' Bit. A fast-boring bit with a single-cutter head. Bores one inch in eight turns.



No. 48 Bellhangers' Drill. Stocked in three lengths of 12, 18 and 24 inches over all and in sizes up to $2\frac{1}{32}$ -inch.



No. 900 Bit Extension. Drives a 1-inch bit and follows a $\frac{3}{8}$ -inch bit. Positive lock prevents tool from coming loose.



Hydraulic Pipe Pusher

With this tool, one man can stand in a comfortable position and send pipe where it is wanted, simply by pumping the handles. Capacity for 4" and smaller pipe.

GREENLEE TOOL CO., Rockford, Illinois, U. S. A.

(DIVISION OF GREENLEE BROS. & CO.)