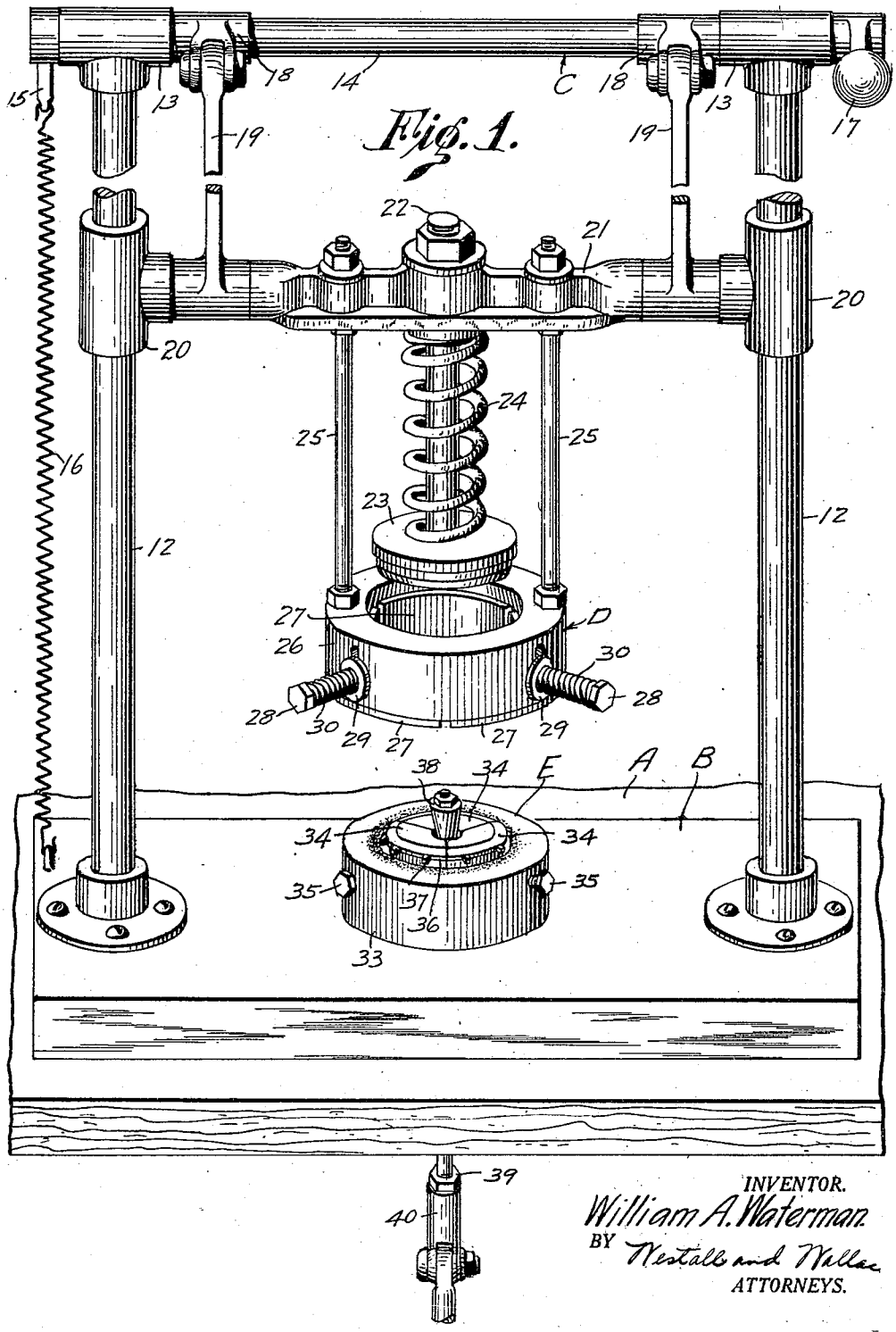
May 1, 1923. 1,453,647

W. A. WATERMAN

DISTRIBUTING GATE MACHINE

Filed Nov. 9, 1921 3 Sheets-Sheet 1



INVENTOR.
William A. Waterman
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May 1, 1923. 1,453,647

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DISTRIBUTING GATE MACHINE

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Fig. 2.

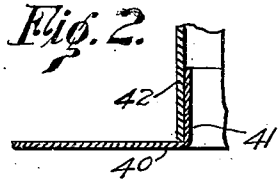


Fig. 3.

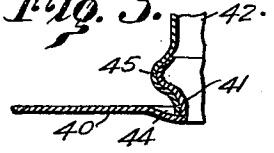


Fig. 4.

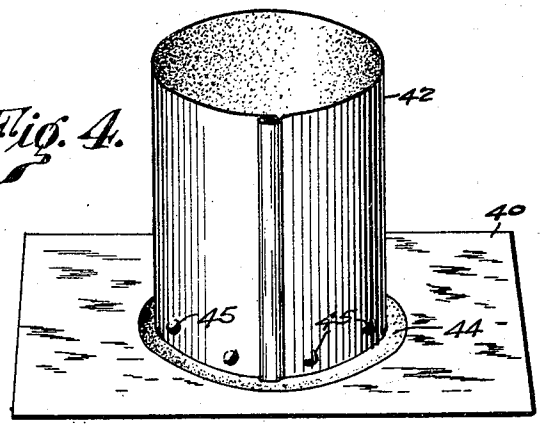


Fig. 5.

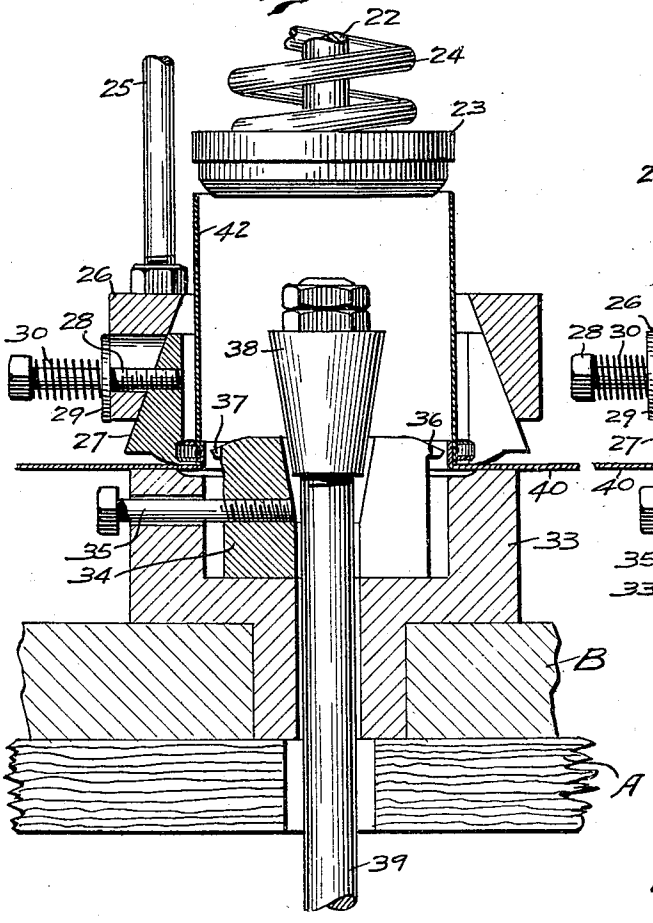
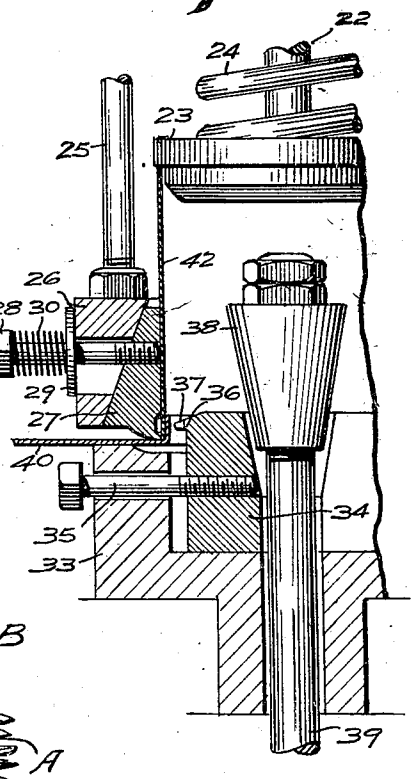


Fig. 6.



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Fig. 7.

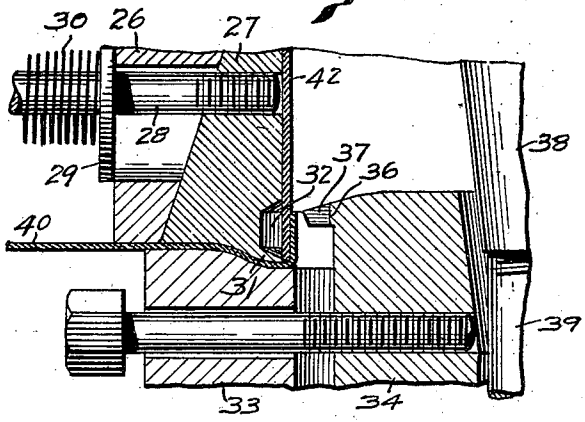


Fig. 10.

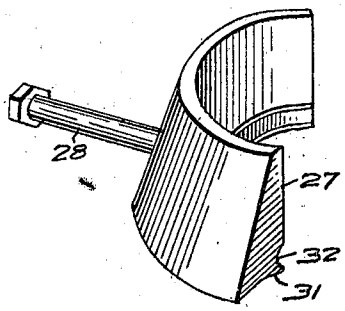


Fig. 11.

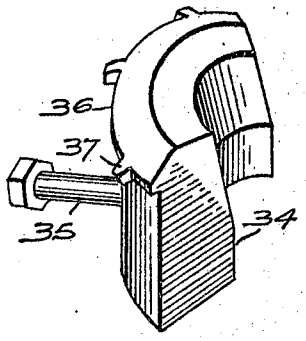


Fig. 8.

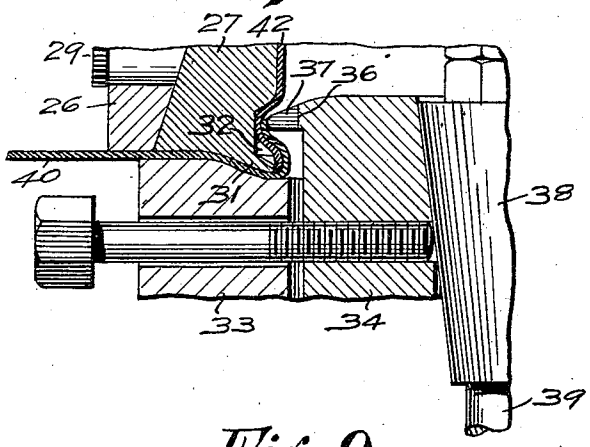
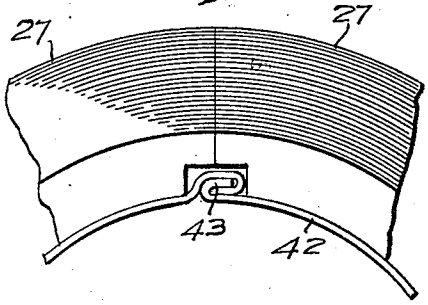


Fig. 9.



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UNITED STATES PATENT OFFICE.

WILLIAM A. WATERMAN, OF EXETER, CALIFORNIA.

DISTRIBUTING-GATE MACHINE.

Application filed November 9, 1921. Serial No. 513,976.

To all whom it may concern:

Be it known that I, WILLIAM A. WATERMAN, a citizen of the United States, residing at Exeter, in the county of Tulare and State of California, have invented new and useful Improvements in a Distributing-Gate Machine, of which the following is a specification.

This invention relates to a machine for pressing or stamping together tubes and frames of sheet metal for forming distributing gates used in irrigation work.

The type of distributing gate upon which this machine is intended to operate, consists of a gate frame having an aperture or port with a flange upset at the aperture edge, and a flume engaging tube which is telescoped with the flange. It is the practice to fasten the tubes and frames together by crimping or by soldering, so as to form a non-leak joint.

An object of my invention is to provide a simple, easily manipulated, positively operating machine which will hold an assembled frame and tube rigidly in position and stamp or press the two elements together. In addition to the broader object of my invention, there are certain details of design whereby a compact, durable and economical machine is secured.

I accomplish the above mentioned objects by means of the embodiment of my invention illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view of a complete machine, a portion being shown broken away for convenience of illustration; Fig. 2 is a vertical section through a fragment of a frame and tube in assembled position before being operated upon by the machine; Fig. 3 is a vertical section showing a fragment of a tube and frame after being pressed together; Fig. 4 is a perspective view of a tube and frame after being operated upon by the machine; Fig. 5 is a central vertical section through the machine showing a tube and frame in position ready to be pressed together; Fig. 6 is a view similar to Fig. 5 showing another position of the parts; Fig. 7 is a fragmentary central vertical section showing still another position of the elements; Fig. 8 is a view similar to Fig. 7, showing the final position of the elements; Fig. 9 is a fragmentary plan view of tube engaging segments with a tube in position; Fig. 10 is a perspective view of a tube engaging segment; and Fig. 11 is a perspective view of the stamping segment.

Referring more particularly to Fig. 1, a base for the device is indicated by A. Mounted upon the base is a table B supporting an operating head indicated generally by C. Secured to the operating head so as to be moved vertically is a tube engaging structure indicated generally by D. Mounted upon the table B in alignment with the tube engaging device D is a gate frame support E which cooperates with the tube engaging device to press the tube and engaging frame together.

The operating head comprises standards 12 having bearings 13 at the top thereof for a horizontal shaft 14. Fixed to one end of shaft 14 and overhanging a bearing 13 is an arm 15 to which is secured a tension spring 16 tending to hold the parts of the operating head in their upper position. Secured to the other end of the shaft 14 is a handle 17 for rotating the shaft 14. Fixed to the shaft 14 are arms 18 for pivotal connection to rods 19. Slidably mounted upon standards 12 are cross heads 20 secured to each other by a cross piece 21. The rods 19 are pivotally mounted upon the cross piece 21. It is obvious that by pulling the hand lever 17 downwardly, the arms 18 will be swung downwardly, forcing rods 19 and cross piece 21 into a lower position. The cross piece 21 is guided upon the standards by means of the cross heads so that it moves in a straight line.

An eye is formed at the center of cross piece 21 and extending therethrough is a stem 22. At the lower part of the stem is a disk 23 reduced in diameter to form a shoulder so that the disk will extend inside of a tube and abut the top thereof. A compression spring 24 holds disk 23 in its lower position and permits a yielding movement thereof.

Depending from cross piece 21 are rods 25 supporting a ring 26. Referring more particularly to Figs. 5, 6, 7, 8, and 10, ring 26 is provided with a tapered bore with the smaller diameter at the upper side. Mounted in the bore are tube engaging segments 27 having outer faces tapering in correspondence with the taper of the bore. Secured to each segment is a stem 28. Each stem extends through a longitudinal slot in the ring 26 and is covered by a washer 29. Disposed over each stem between the washer 29 and

the head of the stem is a compression spring 30 tending to force the stems outwardly and thereby move the segments into their lower position as shown in Fig. 5. The segments have a rounded swell 31 on their lower face at the inner edge, see Figs. 6, 8, and 10. On their inner face there is an annular recess indicated by 32.

Mounted upon the table B is the frame supporting element comprising a cup shaped body 33 having a cylindrical recess best shown in Figs. 5 and 6. Disposed in the recess are segments 34 forming an expansible plug. Each segment has a stem 35 slidably extending through a bore in the cup 33 and holding the segment in position. The segments 34 are provided with outwardly extending shoulders 36 to cooperate with the recesses 32 in the segments 27. Extending from the shoulders are stamping prongs 37. The segments 34 when assembled form a split plug having a bore tapered at the upper side to receive a cone shaped wedge 38. The wedge 38 is mounted upon a rod 39 slidably extending through the cup shaped member, the table B and base A. Rod 39 is connected by linkage, whereby it may be operated from the foot pedal or any other desired device. Upon pulling the rod 39 downwardly, wedge 38 is moved between segments 34 and the latter are expanded. A depression is formed in the top of body 33 to cooperate with the swell 31 of the segment 27.

In Figs. 3 and 4 the completed gate frame and tube are shown. The frame is indicated by 40 and comprises a flat piece of sheet metal having an opening at the center thereof bounded by a flange portion 41. Before being operated upon by the machine the tube 42 is slipped over the flange as shown in Fig. 2. The tube is made of sheet metal with a seam 43. After being operated upon by the machine the metal adjacent the aperture has been offset slightly as indicated by 44 in Fig. 3 to form an annular projection at the opening. The prongs 37 on the segments 34 have pressed into the flange 41 stamping and pressing the tube together as indicated at 45.

The frame 40 and tube 42 are assembled in the condition shown in Fig. 2. In this position they are placed upon the frame supporting element E, see Fig. 1 with the segments 34 inside of the tube as shown in Figs. 5 and 7. The handle 17 is grasped and pulled downwardly, moving the tube engaging device E over the tube and into the position shown in Fig. 5. As the tube engaging device is pressed into its lower position, segments 27 engage the frame 40 and are forced upwardly to firmly grasp the tube. Disk 23 is moved downwardly engaging the upper end of the tube, and holding the latter firmly in position, the parts then being in the position shown in Fig. 6. Forcing the lever 17 downwardly stamps the tube and gate into the shape shown in Fig. 7, the parts being in the position shown in Fig. 7. The next operation consists in pulling downwardly upon rod 39, forcing wedge 38 to expand segments 34 and forcing the prongs 37 against the flange, thereby stamping the parts together. Springs 16 return the tube engaging device E to its upper position, and rod 39 is released from the pressure so that the tube and frame may be released from the machine.

It is obvious that whereas I have shown the device as operated manually, it may be embodied in an automatically operated machine.

What I claim is:

1. A machine of the class described comprising a base having an expansible plug provided with prongs to upset a flange and tube from the interior, means to expand said plug, an expansible ring for engaging the exterior of a tube, and means to move said ring downwardly over said plug into engagement with said base to contract said ring.

2. A machine of the character described, comprising a base having an expansible plug provided with prongs to upset a flange and tube from the interior, means to expand said plug, an expansible ring for engagement with the exterior of a tube, means to move said ring downwardly over said plug into engagement with said base to contact said ring, and a centering disk movable with said ring to engage the upper end of the tube.

3. A machine of the character described comprising a base having an expansible plug formed of segments provided with prongs and having a tapered bore, a wedge for said bore movable thereinto to expand said segments, an expansible ring for engaging the interior of the tube, means to move said ring downwardly over said plug into engagement with said base and to contract said ring.

4. A machine of the character described comprising a base having an expansible plug provided with prongs to upset a flange and tube from the interior, means to expand said plug, a ring having a tapered bore, segments having tapered outer faces mounted in said bore, means tending to expand said segments and project the latter below the lower face of said ring whereby pressure upon the segments by said base will contract said ring.

5. A machine of the character described comprising a base having an expansible plug formed of segments provided with prongs and having a tapered bore, a wedge for said bore to expand said segments, an expansible ring for engaging the exterior of the tube, means to move said ring downwardly over

said plug into engagement with said base to contract said ring, and a centering disk movable with said ring to engage the upper end of the tube.

6. A machine of the character described comprising a base having an expansible plug provided with prongs to upset a flange and tube from the interior, means to expand said plug, a ring having a tapered bore, segments having tapered outer faces disposed in said bore, means tending to expand said segments and project the latter below the lower face of said ring, means to move said ring downwardly over said plug into engagement wth said gate to contract said ring, and a centering disk movable with said ring to engage the upper end of the tube.

7. A machine of the character described comprising a base having an expansible plug formed of segments provided with prongs and having a tapered bore, a wedge in said bore movable to expand said segments, a ring having a tapered bore, segments having tapered outer faces disposed in said bore, means tending to expand said segments and project the latter below the lower face of said ring whereby pressure by the segments upon said base will contract said segments, means to move said ring downwardly over said plug into engagement with said base to contract said ring.

8. A machine of the character described comprising a base having an expansible plug formed of segments provided with prongs and having a tapered bore, a wedge in said bore movable to expand said segments, a ring having a tapered bore, segments having tapered outer faces disposed in said bore, means tending to expand said segments and project the latter below the lower face of said ring whereby pressure by the segments upon said base will contract said segments, means to move said rings downwardly over said plug into engagement with said base to contract said ring, and a centering disk movable with said ring to engage the upper edge of the tube.

In witness that I claim the foregoing I have hereunto subscribed my name this 3rd day of November, 1921.

WILLIAM A. WATERMAN.