No. 788,969. PATENTED MAY 2, 1905.

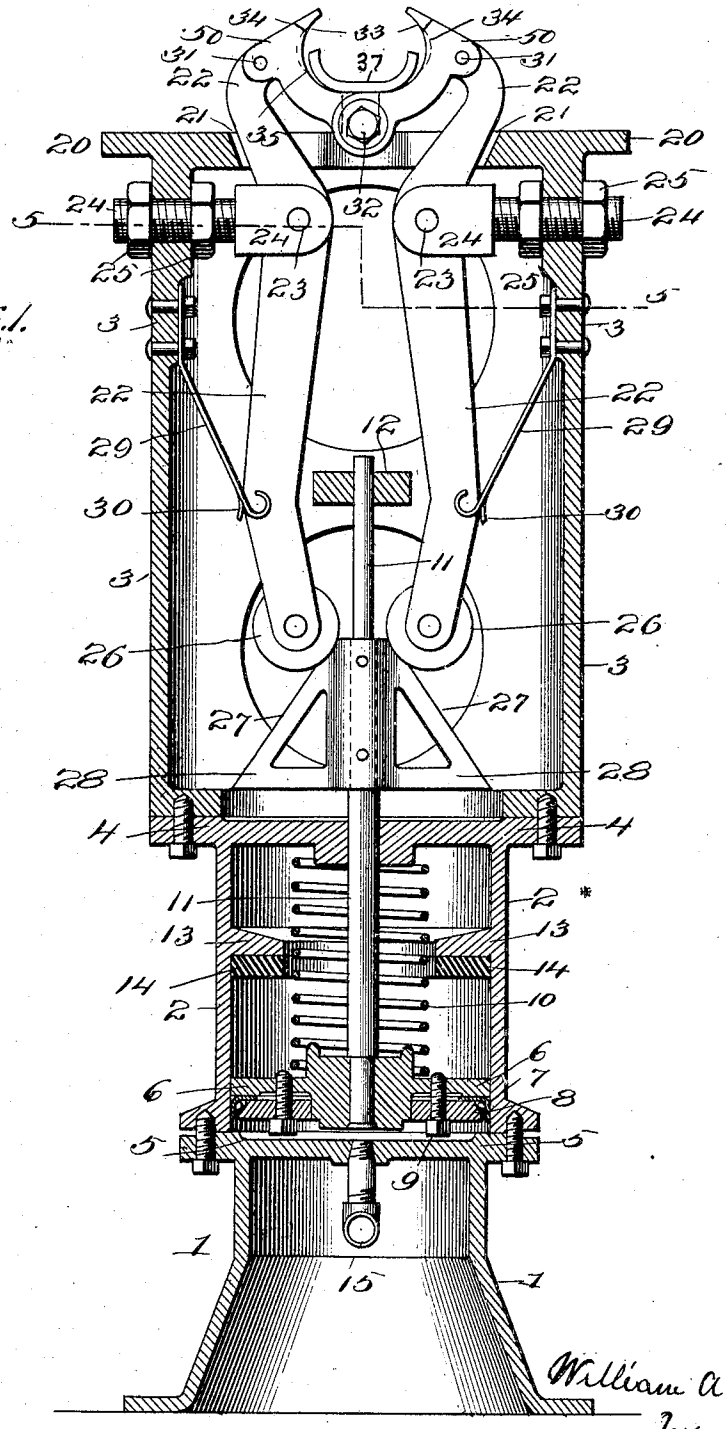
W. A. WALKER.

MACHINE FOR APPLYING CLIPS TO HOSE.

APPLICATION FILED NOV. 19, 1904.

6 SHEETS—SHEET 1.

Fig. 1.



Witnesses

J. M. Fowler Jr.

Geo. C. Heard

Inventor

William A. Walker

by

Grant Burroughs

Attorney

By

PHOTO LITHOGRAPHED BY SACKETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 788,969. PATENTED MAY 2, 1905.

W. A. WALKER.

MACHINE FOR APPLYING CLIPS TO HOSE.

APPLICATION FILED NOV. 19, 1904.

6 SHEETS—SHEET 2.

Fig. 2.

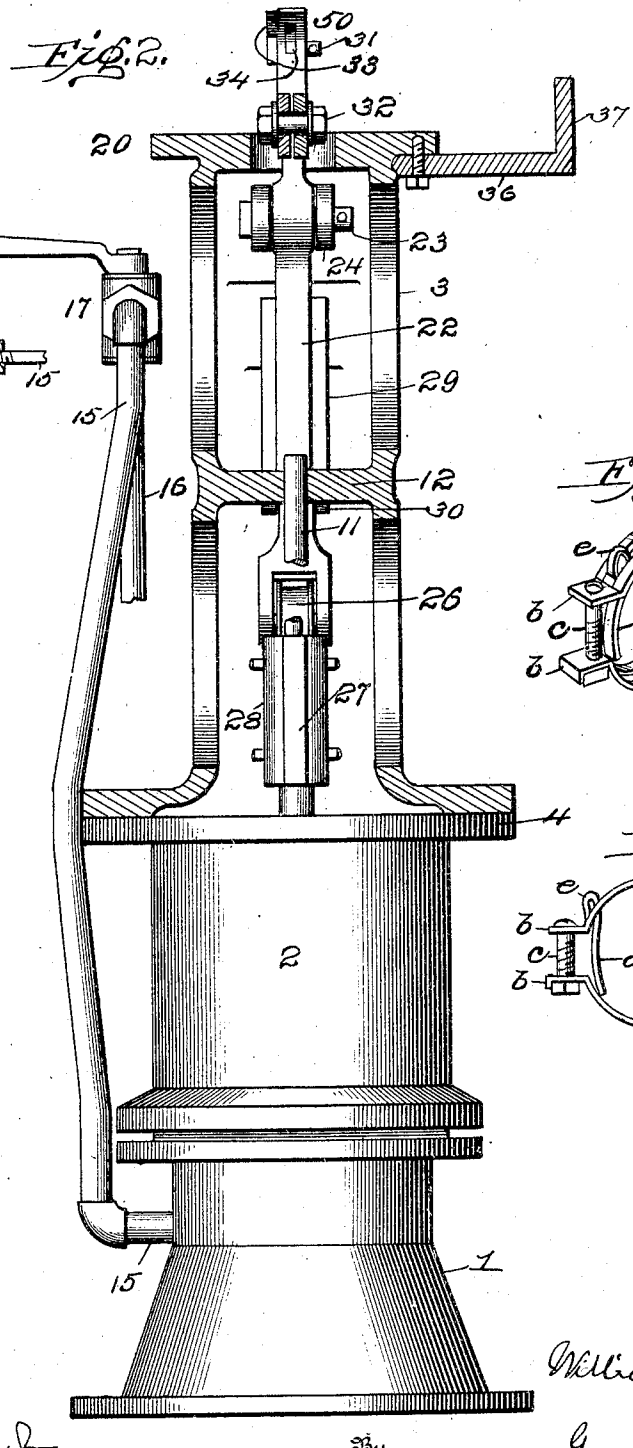


Fig. 3.

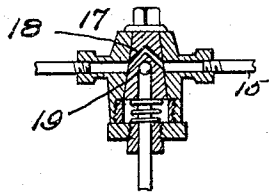


Fig. 10.

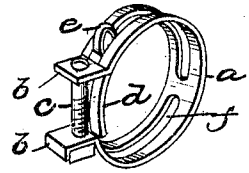
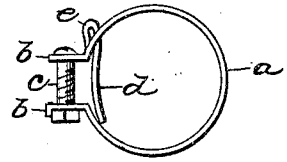


Fig. 11.



Witnesses
J. M. Fowler Jr.
Geo. L. Heard

By

Inventor
William A. Walker
by
Grant Burroughs
Attorney

PHOTO-LITHOGRAPHED BY SACKETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 788,969. PATENTED MAY 2, 1905.

W. A. WALKER.

MACHINE FOR APPLYING CLIPS TO HOSE.

APPLICATION FILED NOV. 19, 1904.

6 SHEETS—SHEET 3.

Fig. 4.

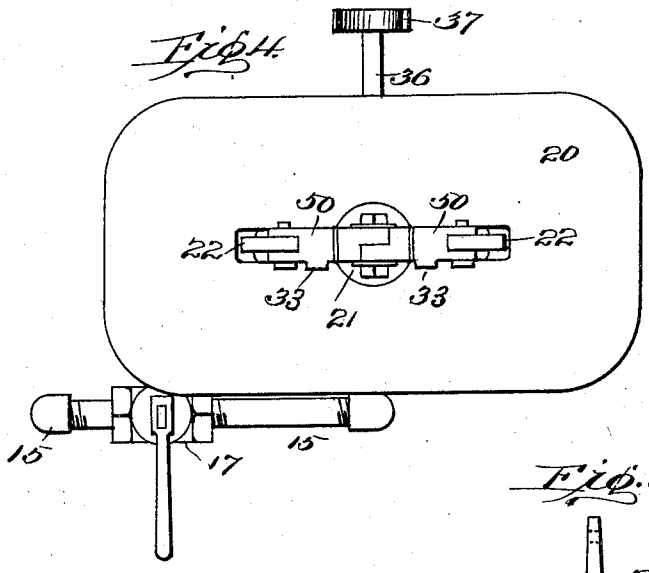


Fig. 5.

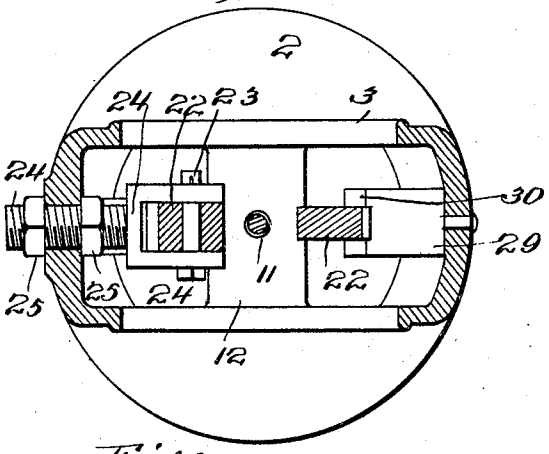


Fig. 6.

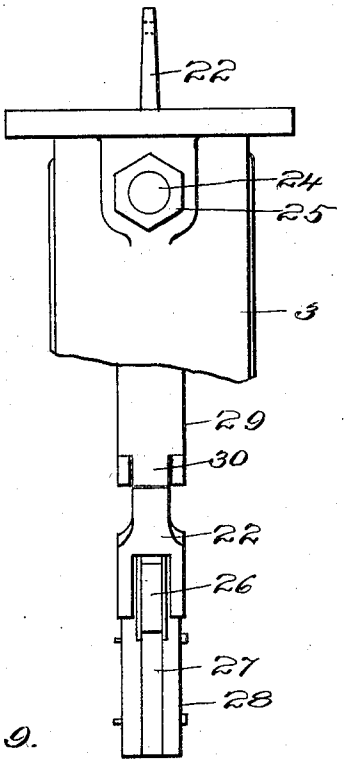


Fig. 7.

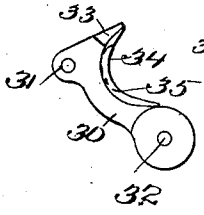


Fig. 8.

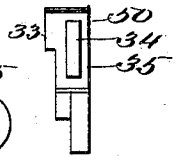
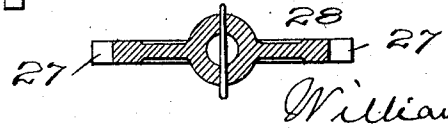


Fig. 9.



Witnesses

J. M. Fowler Jr.

Geo. L. Heard

Inventor

William A. Walker

By Grant Burroughs

Attorney

PHOTO-LITHOGRAPHED BY SACHETT & WILHELMS LITHO. & PTG. CO. NEW YORK

No. 788,969. PATENTED MAY 2, 1905.

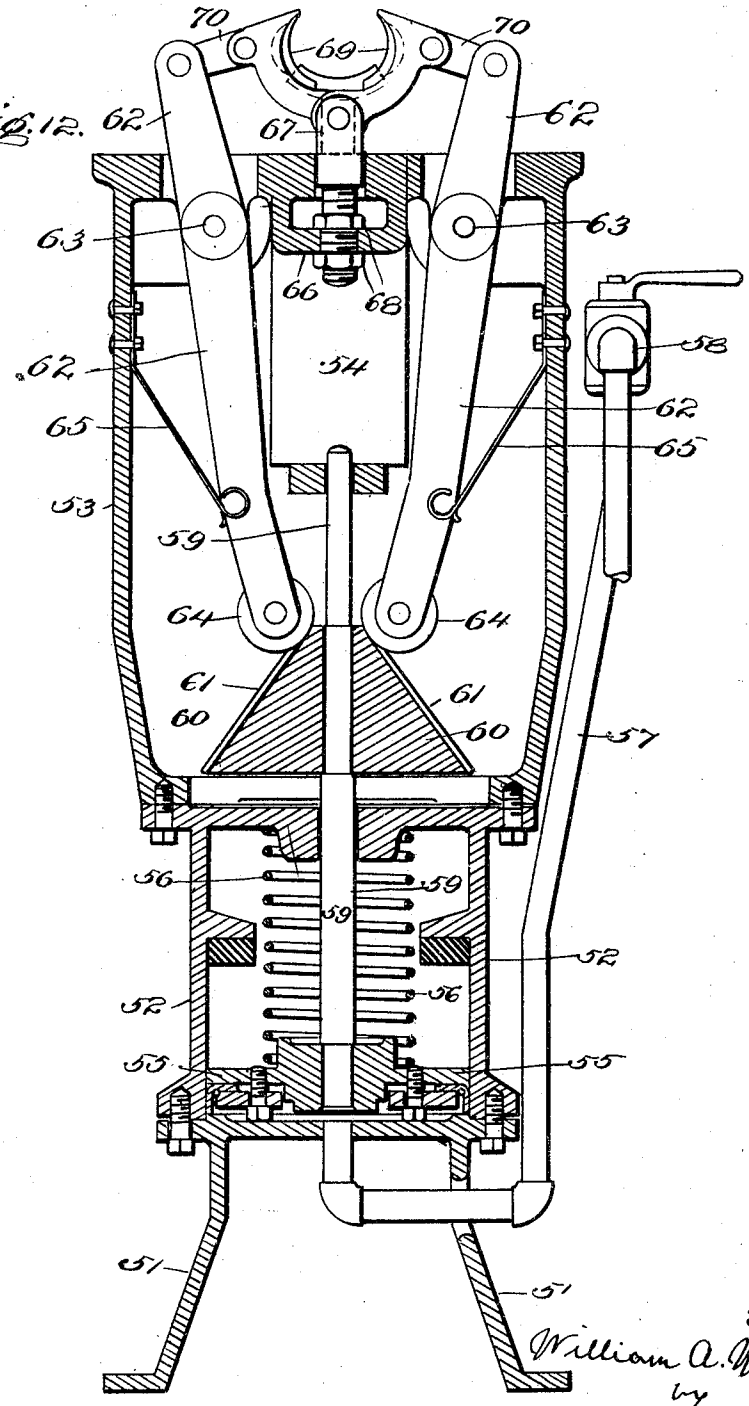
W. A. WALKER.

MACHINE FOR APPLYING CLIPS TO HOSE.

APPLICATION FILED NOV. 19, 1904.

6 SHEETS—SHEET 4.

Fig. 12.



Witnesses
J. M. Foster Jr.
Geo. C. Hazard

Inventor
William A. Walker
by
Grant Burroughs
Attorney

PHOTO-LITHOGRAPHED BY SACKETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 788,969. PATENTED MAY 2, 1905.

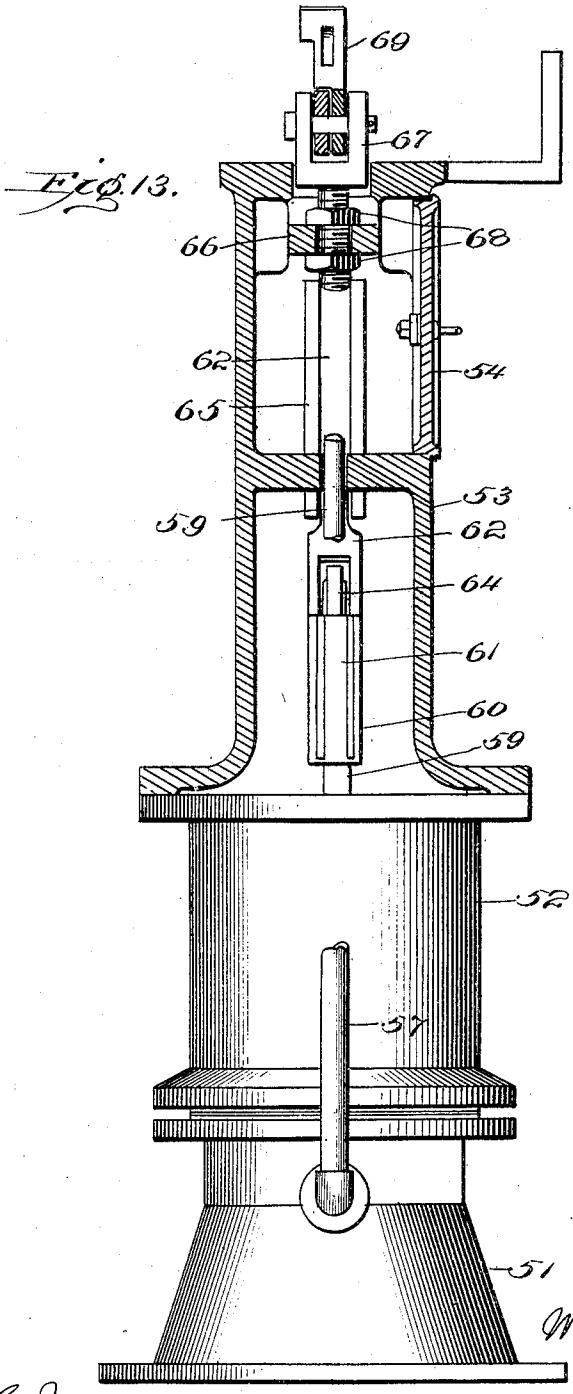
W. A. WALKER.

MACHINE FOR APPLYING CLIPS TO HOSE.

APPLICATION FILED NOV. 19, 1904.

6 SHEETS—SHEET 5.

Fig. 13.



Witnesses
J. M. Foster Jr
Geo. E. Heald

Inventor
William A. Walker
by
Grant Burroughs
Attorney

PHOTO-LITHOGRAPHED BY SACKETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 788,969. PATENTED MAY 2, 1905.

W. A. WALKER.

MACHINE FOR APPLYING CLIPS TO HOSE.

APPLICATION FILED NOV. 19, 1904.

6 SHEETS—SHEET 6.

Fig. 14.

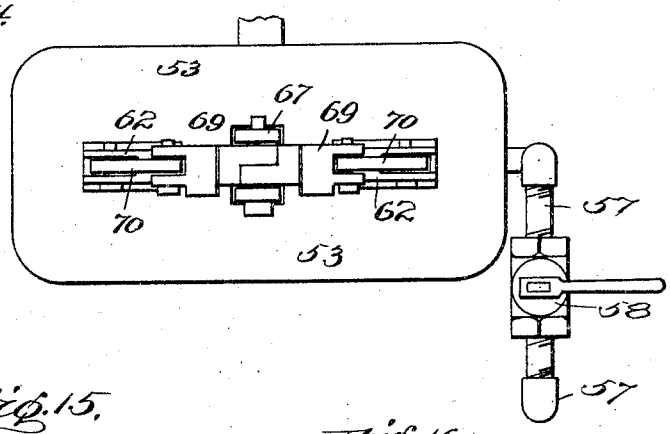


Fig. 15.

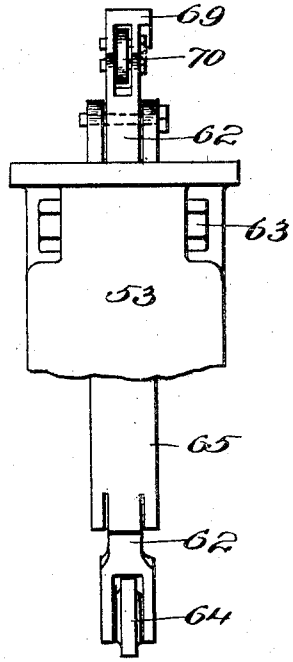


Fig. 16.

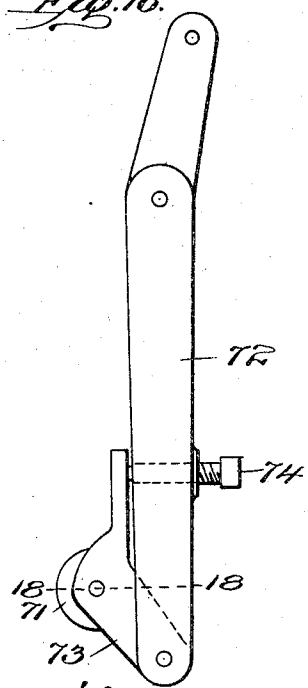


Fig. 17.

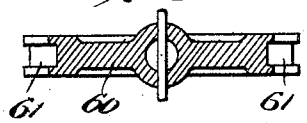
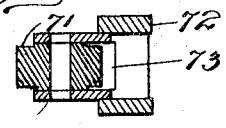


Fig. 18.



Witnesses

J. M. Fowler Jr.

Geo. L. Read

Inventor

William A. Walker

By Grant Burroughs

Attorney

PHOTO LITHOGRAPHED BY SACHETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 788,969. Patented May 2, 1905.

UNITED STATES PATENT OFFICE.

WILLIAM A. WALKER, OF BALTIMORE, MARYLAND.

MACHINE FOR APPLYING CLIPS TO HOSE.

SPECIFICATION forming part of Letters Patent No. 788,969, dated May 2, 1905.

Application filed November 19, 1904. Serial No. 233,508.

To all whom it may concern:

Be it known that I, WILLIAM A. WALKER, a citizen of the United States, and a resident of the city of Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Machines for Applying Clips to Hose, of which the following is a full, clear, and exact description, such as will enable those skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

The invention relates to improvements in machines of that description which are employed in securing clips about the end of a hose into which a coupling-piece has been inserted. Owing to the stiffness of the metal forming such clips and the resistance of the material composing the hose, it is necessary to employ powerful clamping mechanism to force the clip into place preparatory to the insertion of the holding-bolt.

The invention particularly relates to an improved machine for applying the clip shown and described in Patent No. 480,515, of August 9, 1892. One of the essential features of this particular clip is the tongue, that is formed by folding back on itself a strip of the metal cut from the body of the clip, with the folded part projecting outside of the periphery of the main part of the clip. When the clip is in place about the hose, the tongue, which is on one end of the clip, spans the intervening space between the ends of the clip, and its free end registers with a slit in the opposite end of the clip. When this particular clip is applied, it should be forced into place with a smooth and even movement, so as to permit the tongue to assume its proper place across the intervening space between the ends of the clip and with its free end registering with the opposite slit. Should there be a rough and uneven movement in bringing the ends of the clip together, the tongue would be apt to miss registering with the opposite slit. Also excessive strain should not be brought to bear upon the tongue during the application of the clip, for when it occurs the tongue is often sprung and cannot register with the slit. Sometimes the excessive strain applied to the tongue weakens or breaks it, so that it cannot serve its purpose.

The machines in ordinary use for attaching hose-clips do not act satisfactorily when employed in applying the particular clip referred to. Their operation is too harsh and rough, and they often damage the clip by weakening or breaking the tongue or displacing the latter, so that it will not assume its proper position.

The present invention has for its object the provision of a machine that will apply the clip in a smooth and even manner, so as to permit the tongue to assume its proper place, and also one that will not put any undue strain on the tongue while the clip is being applied.

The invention consists in the novel construction, combination, and arrangement of parts, such as will be hereinafter fully described, pointed out in the appended claims, and illustrated in the accompanying drawings.

In the drawings, in which similar reference characters designate corresponding parts, Figure 1 is a vertical sectional view of a machine embodying the invention. Fig. 2 is a view, partly in elevation and partly in vertical section, taken at right angles to the section shown in Fig. 1. Fig. 3 is a detail sectional view of the three-way valve for controlling the admission of the operating fluid into the cylinder. Fig. 4 is a plan view of the machine. Fig. 5 is a horizontal sectional view on the line 5 5 of Fig. 1. Fig. 6 is a detail view showing a part of the casing, one of the operating-levers, and the wedge-block. Figs. 7 and 8 are detail views showing one of the clamping-jaws. Fig. 9 is a cross-sectional view of the wedge-block. Figs. 10 and 11 are views showing the clip. Fig. 12 is a vertical sectional view showing the machine with modifications. Fig. 13 is a view, partly in elevation and partly in vertical section, of the modified machine. Fig. 14 is a plan view of the same. Fig. 15 is a detail view showing part of the casing and one of the operating-levers of the modified form. Fig. 16 is a detail view showing one of the operating-levers provided with an adjustable friction-roll. Fig. 17 is a cross-sec-

tional view showing a modified form of the wedge-block. Fig. 18 is a sectional view on the line 18 18 of Fig. 16.

The machine is designed to be operated by compressed air; but any other suitable fluid under pressure can be used.

The particular clip which the machine is specially intended to apply consists of the body portion *a*, provided at its ends with the ears *b*, through which the bolt *c* passes to secure the clip in place, Figs. 10 and 11. A tongue *d* is formed at one end of the clip by a strip of metal cut from the body of the clip and folded back on itself, as at *e*, and extends toward the opposite end of the clip. When the two ends of the clip are brought together preparatory to the insertion of the holding-bolt *c*, the free end of the tongue spans the intervening space between the two ends and passes through the slit *f* in the opposite end of the clip. It is to be observed that the folded part *e* of the tongue projects outside of the periphery of the main part of the clip. When an ordinary clamping-machine is used, this folded part receives the whole force of the clamping-jaws, and the tongue is thereby displaced or damaged. One of the objects of the present invention is to provide clamping-jaws that will not contact with this folded part of the tongue.

The operative parts of the machine are inclosed to a considerable extent by a hollow casing, so as to be protected against injury and also to avoid accidents to the workmen. This casing also forms the support for the several operative parts. It comprises the bottom section 1, the middle section 2, and the top section 3. The abutting ends of the sections are flanged and are secured together by suitable bolts passing through the same. The two lower sections have a tubular formation and the top one has a flattened front and back and rounded sides. The middle section 2 forms a cylinder, with its upper head consisting of the crown 4 of the said section and its lower head formed of the crown 5 of the bottom section 1. In the cylinder is the piston 6, provided with the packing 7, held in place by the annular plate 8, and the screws 9 passing through said plate into the piston. The piston is normally pressed downward by the coiled spring 10, interposed between the same and the upper cylinder-head 4. Connected with the piston and passing through the upper head 4 is the rod 11, with its upper end in a bearing in the cross-piece 12 in the top section 3. In the cylinder, slightly above its middle part, is the annular flange 13, having the elastic cushion 14 on its under side. The flange limits the upward movement of the piston, and the impact of the latter is received by the cushion to avoid jarring.

A pipe 15, leading from a source of compressed air, passes through the side of the bottom section 1 and communicates, through the head 5, with the lower end of the cylinder beneath the piston. This pipe also connects with the exhaust-pipe 16. At the intersection of the pipes 15 and 16 is the three-way valve 17, Fig. 3. In the valve-plug are the induction-port 18 and the eduction-port 19. The induction-port 18 is so located in the plug as to form a continuous passage through the pipe 15 from the source of compressed air to the cylinder when the valve is operated to admit the fluid to the cylinder. The lower end of the eduction-port 19 registers with the exhaust-pipe 16, and its upper end is so located as to form a passage from the cylinder, through the inner end of the pipe 15, to the exhaust-pipe 16. The eduction-port is much larger than the induction-port, so that the compressed air will much more quickly leave the cylinder than it will enter the same. This will give a comparatively slow movement the piston upward and a quick return of the same. By means of the three-way valve the piston-rod 11 and the parts connected with it can be given a reciprocative motion.

In the crown 20 of the top section 3 of the casing is the central opening 21, through which project the upper ends of the levers 22. The latter are pivoted, as at 23, in the brackets 24, adjustably mounted in the opposite sides of the casing. The stem of each bracket is screw-threaded and passes through an opening in the wall of the casing. On the stem and on opposite sides of the wall are the nuts 25 for clamping the wall, and thereby holding the bracket in its adjustments. On the lower ends of the levers 22 are the friction-rolls 26, with grooves in their peripheries. These rolls engage with the oppositely-inclined cam-faces of the wedge-block 28, secured on the upper end of the piston-rod 11. Springs 29, secured to the casing, bear upon the levers 22 and force their rolls into engagement with the wedge-block. The ends of the springs, as at 30, are bifurcated, so as to straddle the levers, and are thereby prevented from slipping off the same. When the wedge-block is reciprocated through the movement of the piston-rod, the levers are oscillated in opposite directions.

Clamping-jaws 50 are respectively pivoted to the upper ends of the levers 22, as at 31, and are hinged together at their lower ends, as at 32. The upper ends of the jaws are wedge-shaped and have a lateral extension 33 and are provided with a recess 34 in their face. The faces of the jaws are protected against wear by the hardened-steel plates 35. Through the oscillation of the levers 22 the jaws are opened and closed. The distance which they will open and close can be regulated by adjusting the brackets 24 in the casing.

The crown 20 of the top section of the casing forms the work-table. Secured to an edge of the same is the bracket 36, having a rest 37 in line with the clamping-jaws to form a sup-

port for the free end of the hose while a clip is being applied.

The operation of the device is as follows: The end of the hose into which the coupling has been inserted and on which the clip has been placed outside of the coupling-piece is placed between the clamping-jaws with the clip directly between them and with the folded part *e* of the tongue directly opposite the recess 34 in either of the clamping-jaws. The other end of the hose is supported by the rest 37. After the hose has been placed in position the three-way valve 17 is turned so that the induction-port 18 completes the passage through the supply-pipe 15, so that the compressed air can enter the cylinder. As the air enters the cylinder the piston is forced upward with a comparatively slow movement against the action of the spring 10 and also against the actions of the springs 29. Through the intervening mechanism the clamping-jaws slowly close about the clip, and the latter is compressed around the hose and there held. The holding-bolt *c* is then secured in place. This closing movement of the clamping-jaws is comparatively slow, and the tongue of the clip will have sufficient time within which to take its proper position. As the clamping-jaws come together the folded part *e* of the tongue registers with one of the recesses 34, and consequently no undue strain will be put upon the tongue. The clips may not always be placed in the same position relative to the end of the hose. Some may be nearer the end and others farther away. The position of the jaws relative to the end of the hose is controlled by the coupling-piece, against which the jaws abut when the hose is placed in position. Any slight variation in the positions of the different clips is allowed for by the lateral extensions 33 of the jaws and the comparatively large recesses 34 in the faces of the same. By having recesses in both jaws the clips can be placed with the folded part of the tongue on either side of the hose. After the clip has been secured in place the three-way valve 17 is turned so that the eduction-port 19 registers with the cylinder end of the pipe 15, and thereby forms a continuous passage from the cylinder to the exhaust-pipe 16, through which the compressed air escapes. As the eduction-port is comparatively large, the cylinder will be quickly freed of the compressed air, and the springs 10 and 29, operating through the intervening mechanism, will quickly release and set the clamping-jaws for the next operation.

In Figs. 12 to 18, inclusive, several modifications of different parts of the machine are shown. The casing shown in Figs. 12, 13, and 14 has substantially the same construction as that already described. It consists of the bottom section 51, the intermediate section 52, and the top section 53. In this instance the casing is almost entirely closed and is provided with doors, as at 54, for closing such openings as are necessary. In the intermediate section is the cylinder in which the piston 55 moves and is opposed by the spring 56. A pipe 57 leads from a supply of compressed air to the cylinder and is connected with an exhaust-pipe, at the intersection of which is the three-way valve 58, controlling the passages through the same. Connected with the piston is the rod 59, carrying the wedge-block 60, provided with inclined grooved faces 61. Projecting through the crown of the top section 53 of the casing are the ends of the levers 62, fulcrumed on fixed pivots 63 in the casing. At the lower ends of these levers are the friction-rolls 64, which fit into the grooved faces of the wedge-block. Springs 65, secured to the casing, bear on the levers and press the rolls against the inclined faces. On the under side of the crown of the top section 53 is the support 66, through which passes the stem of the bracket 67, with its upper end projecting above the crown. On the stem of the bracket and on opposite sides of the support are the clamping-nuts whereby the bracket can be adjusted and secured in its adjustments. Fulcrumed on the upper end of the bracket are the clamping-jaws 69, of the same construction as those already described. They are connected with the upper ends of the levers 62 by the links 70. By means of the adjustable bracket the distance which the jaws will open and close can be regulated. The operation of the machine in this instance is substantially the same as in the former one.

In Figs. 16 and 18 is shown a friction-roll 71, adjustably mounted on the lever 72. The latter corresponds with the levers 22 and 62, already described. Here the friction-roll is journaled in the arm 73, hinged to the lower end of the lever in a position to engage with the wedge-block. The position of the roll relative to the lower end of the lever can be adjusted by means of the set-screw 74. Levers provided with such adjustable rolls can be regulated to give a greater or less opening of the clamping-jaws.

Other modifications of the machine are obvious.

While the machine has been described as being adapted to a particular form of clip, yet it can be employed in applying clips of other forms.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a clip-applying machine, pivoted clamping-jaws, levers provided with adjustable fulcrums connected with said jaws, and means for oscillating said levers to give a comparatively slow closing movement and a comparatively quick opening movement of said jaws.

2. In a clip-applying machine, pivoted clamping-jaws, pivoted levers connected with

said jaws, a wedge-block having cam-faces bearing on said levers, and means for moving said wedge-block to oscillate said levers in opposite directions to open and close said jaws.

3. In a clip-applying machine, pivoted clamping-jaws, pivoted levers connected with said jaws, a wedge-block having cam-faces bearing on said levers, a cylinder, a piston in said cylinder and connected with said wedge-block, and means for admitting fluid under pressure into said cylinder to move said piston.

4. In a clip-applying machine, pivoted clamping-jaws, pivoted levers connected with said jaws, a wedge-block having cam-faces bearing on said levers, a cylinder, a piston in said cylinder and connected with said wedge-block, a spring pressing said piston in one direction, and means for admitting fluid under pressure into said cylinder to move said piston against the action of said spring.

5. In a clip-applying machine, hinged clamping-jaws, levers having adjustable fulcrums connected with said jaws, a wedge-block having cam-faces bearing on said levers, and means for moving said wedge-block to oscillate said levers in opposite directions to open and close said jaws.

6. In a clip-applying machine, pivoted clamping-jaws, pivoted levers connected with said jaws, a wedge-block having cam-faces bearing on said levers, springs pressing said levers against said cam-faces, and means for moving said wedge-blocks to oscillate said levers in opposite directions to open and close said jaws.

7. In a clip-applying machine, pivoted clamping-jaws, pivoted levers provided with adjustable fulcrums connected with said jaws, a wedge-block having cam-faces bearing on said levers, springs pressing said levers against said cam-faces, and means for moving said wedge-blocks to oscillate said levers in opposite directions to open and close said jaws.

8. In a clip-applying machine, pivoted clamping-jaws, pivoted levers connected with said jaws, a wedge-block having cam-faces, rolls on said levers and bearing on said cam-faces, and means for moving said wedge-block to oscillate said levers in opposite directions to open and close said jaws.

9. In a clip-applying machine, pivoted clamping-jaws, levers provided with adjustable fulcrums connected with said jaws, a wedge-block having cam-faces, rolls on said levers and bearing on said cam-faces, and means for moving said wedge-block to oscillate said levers in opposite directions to open and close said jaws.

10. In a clip-applying machine, pivoted clamping-jaws, pivoted levers connected with said jaws, a wedge-block having cam-faces, rolls on said levers and bearing on said cam-faces, springs bearing on said levers and pressing said rolls against said cam-faces, and means for moving said wedge-block to oscillate said levers in opposite directions to open and close said jaws.

11. In a clip-applying machine, pivoted clamping-jaws, levers provided with adjustable fulcrums connected with said jaws, a wedge-block having cam-faces, rolls on said levers and bearing on said cam-faces, springs bearing on said levers and pressing said rolls against said cam-faces, and means for moving said wedge-block to oscillate said levers in opposite directions to open and close said jaws.

12. In a clip-applying machine, pivoted clamping-jaws, levers provided with adjustable fulcrums connected with said jaws, a wedge-block having cam-faces, rolls on said levers and bearing on said cam-faces, springs bearing on said levers and pressing said rolls against said cam-faces, a cylinder, a piston in said cylinder and connected with said wedge-block, a spring pressing said piston in one direction, and means for admitting fluid under pressure into said cylinder to move said piston against the action of said springs.

13. In a clip-applying machine, pivoted clamping-jaws, levers provided with adjustable fulcrums connected with said jaws, and mechanism operated by fluid-pressure for oscillating said levers to give a comparatively slow closing movement and a comparatively quick opening movement of said jaws.

14. In a clip-applying machine, pivoted clamping-jaws, pivoted levers connected with said jaws, a wedge-block bearing on said levers, and means for reciprocating said wedge-block to oscillate said levers to give a comparatively slow closing movement and a comparatively quick opening movement of said jaws.

15. In a clip-applying machine, pivoted clamping-jaws, pivoted levers connected with said jaws, a wedge-block bearing on said levers, and mechanism operated by fluid-pressure for reciprocating said wedge-block to oscillate said levers to give a comparatively slow closing movement and a comparatively quick opening movement of said jaws.

16. In a clip-applying machine, pivoted clamping-jaws, levers provided with adjustable fulcrums connected with said jaws, a wedge-block bearing on said levers, and mechanism operated by fluid-pressure for reciprocating said wedge-block to oscillate said levers to give a comparatively slow closing movement and a comparatively quick opening movement of said jaws.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

WILLIAM A. WALKER.

Witnesses:
GRANT BURROUGHS,
FRANCIS S. MAGUIRE.