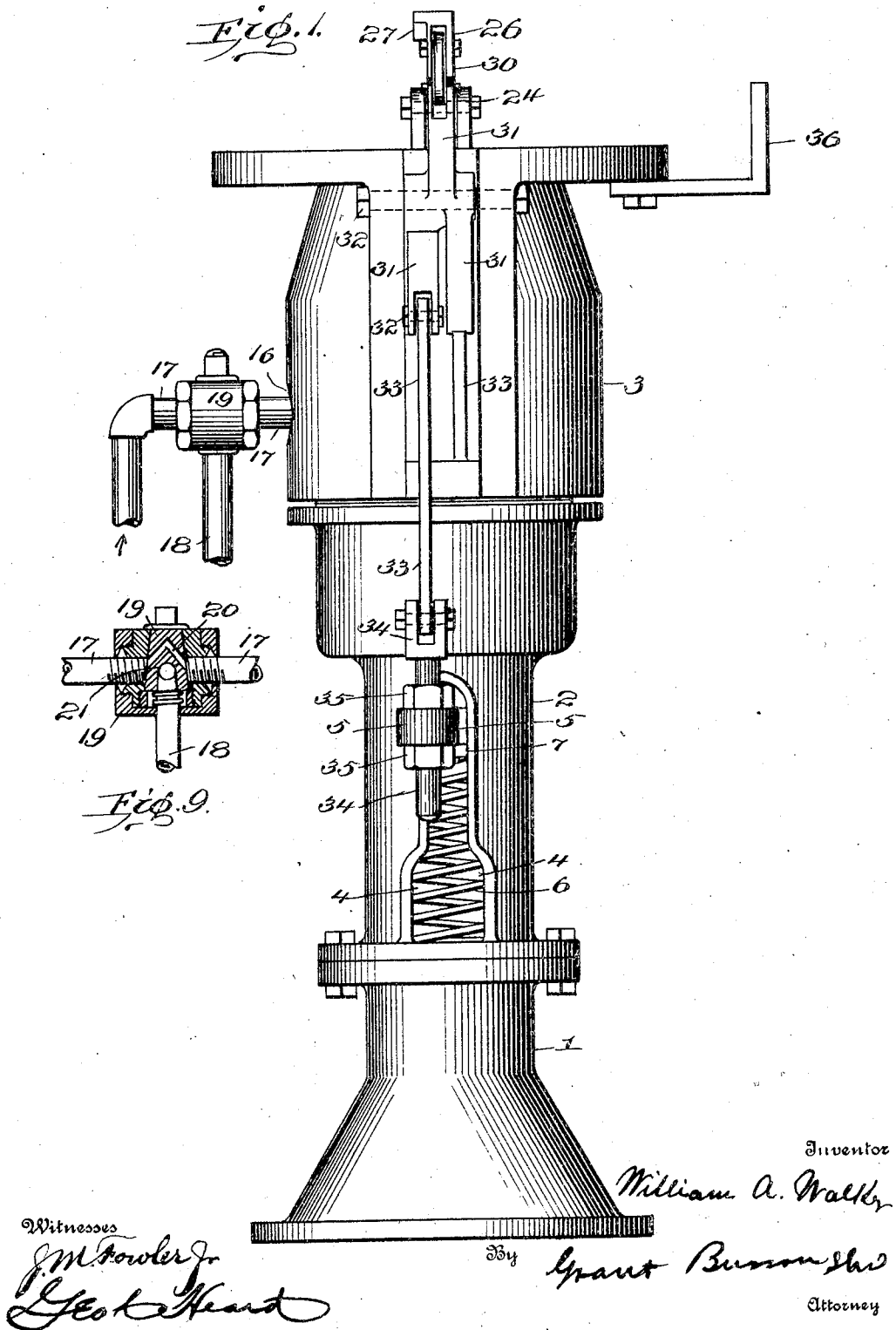


No. 788,968.

PATENTED MAY 2, 1905.

W. A. WALKER.
MACHINE FOR APPLYING CLIPS TO HOSE.
APPLICATION FILED NOV. 19, 1904.

3 SHEETS—SHEET 1.



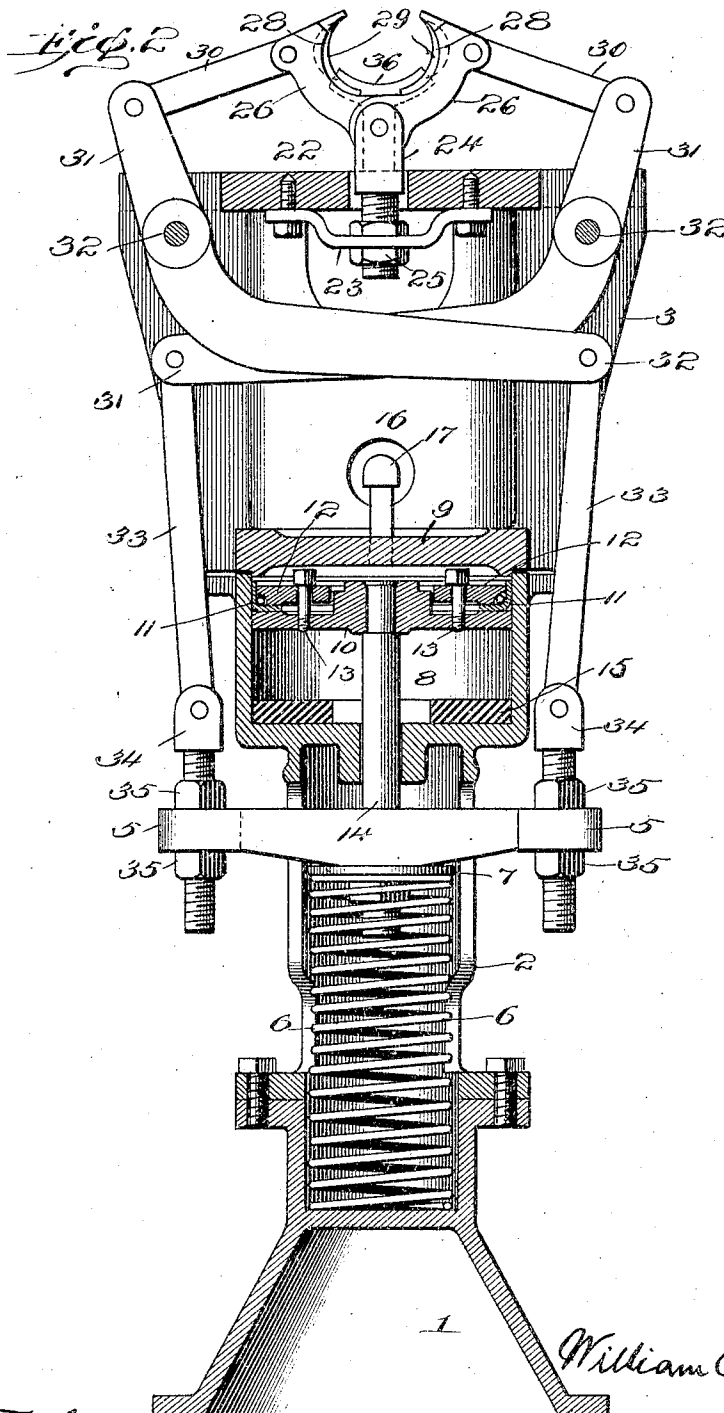
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Witnesses
J. M. Fowler Jr.
Geo. Heard

334

Inventor
William A. Walker
By *Grant Burroughs*
Attorney

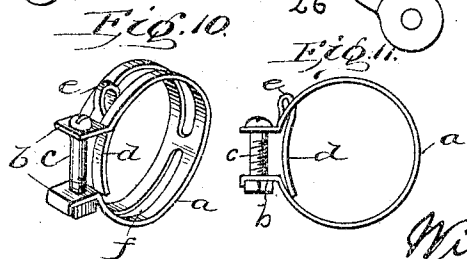
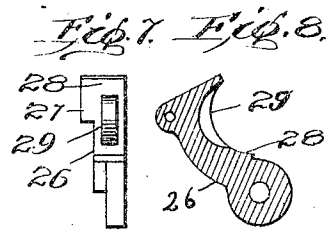
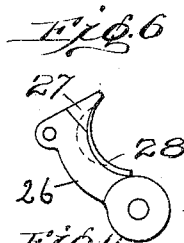
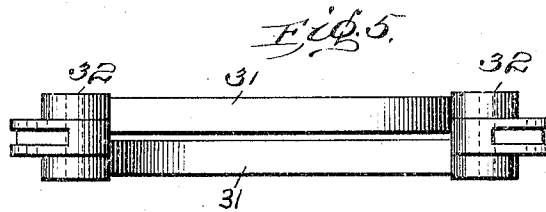
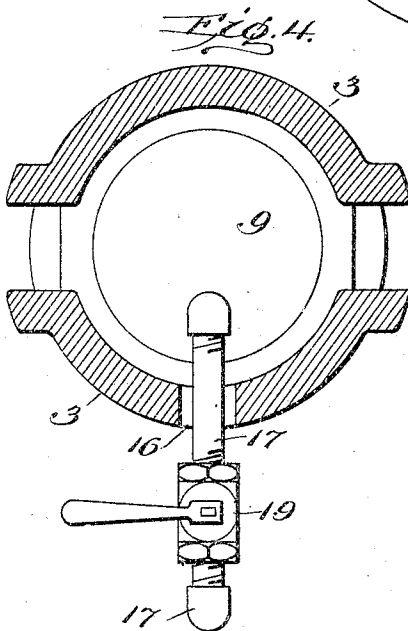
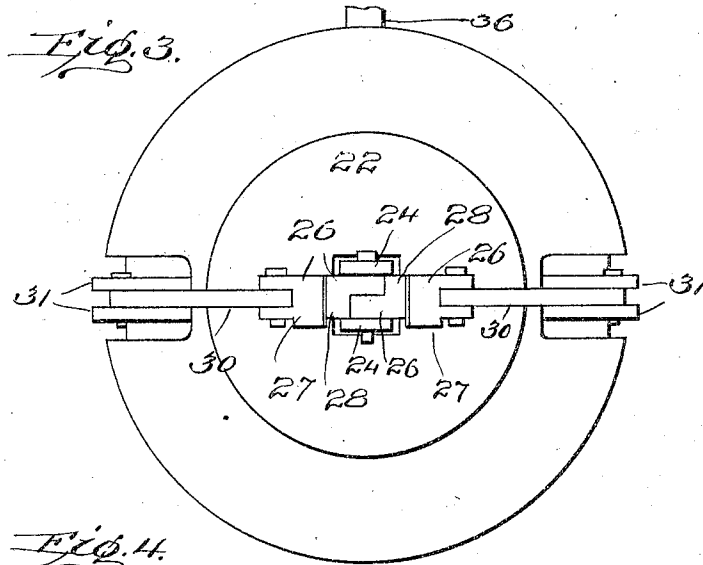
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3 SHEETS—SHEET 3.



Witnesses

J. M. Fowler Jr.
Geo. E. Heard

Inventor

William A. Walker
By *Grant Burroughs*
Attorney

UNITED STATES PATENT OFFICE.

WILLIAM A. WALKER, OF BALTIMORE, MARYLAND.

MACHINE FOR APPLYING CLIPS TO HOSE.

SPECIFICATION forming part of Letters Patent No. 788,968, dated May 2, 1905.

Application filed November 19, 1904. Serial No. 233,507.

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 more 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 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 side elevation of a machine embodying the invention. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a plan view. Fig. 4 is a horizontal sectional view through the supporting-casing just above the cylinder-head. Fig. 5 is a detail plan view showing the levers for oscillating the clamping-jaws. Fig. 6 is a detail side view of one of the clamping-jaws. Fig. 7 is a detail view showing the engaging face of one of the clamping-jaws. Fig. 8 is a longitudinal sectional view of the same. Fig. 9 is a detail sectional view of the three-way valve for controlling the induction and exhaust pipes of the cylinder. Fig. 10 is a perspective view showing one of the particular clips referred to. Fig. 11 is an end view of the same.

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 especially 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 jaws, and the tongue is thereby displaced or damaged. One of the objects of the present invention is to provide jaws that will not contact with this folded part of the tongue.

The supporting-casing of the machine has a generally tubular formation, and it consists of the bottom section 1, the intermediate section 2, and the top section 3. The abutting ends of the sections are provided with flanges, through which bolts pass to hold the several parts together. In the opposite lower sides of the intermediate section are the vertical openings 4, through which passes the cross-head 5. The latter is normally pressed upward by the coiled spring 6, seated in a socket in the upper end of the bottom section. A washer 7 is interposed between the cross-head and the spring to form a bearing for the latter.

In the upper part of the intermediate section 2 is the cylinder 8, the head 9 of which is held in place by being clamped between the abutting ends of the intermediate and top sections of the casing. In the cylinder is the piston 10, provided with the packing 11, held in place by the annular plate 12 and the screws 13. The piston is connected with the cross-head 5 by the rod 14, so that any movement of the piston will be communicated to the cross-head. In the lower end of the cylinder is the elastic cushion 15 to receive the impact of the piston at the end of its downstroke.

Passing through the opening 16 in the top section 3 is the pipe 17, leading from a source of compressed air or other fluid. This pipe leads through the head 9 and communicates with the cylinder above the piston. The pipe 17 also communicates with the exhaust-pipe 18. The passage through the pipes 17 and 18 is controlled by the three-way valve 19, Fig. 9. In the valve-plug are the induction-port 20 and the eduction-port 21. The induction-port is so located in the plug as to form a continuous passage between the two members of the pipe 17 when the plug is turned in the right direction. The lower end of the eduction-port registers with the exhaust-pipe 18. The eduction-port is much larger than the induction-port, so that the egress of the compressed air from the cylinder

will be much quicker than its ingress. This will give a comparatively slow movement of the piston downward and a quick movement of the same upward. By a proper manipulation of the three-way valve the cross-head 5 can be reciprocated against the action of the spring 6.

In the upper end of the top section 3 is seated the plate 22. To the under side of this plate is secured the bracket 23, carrying the adjustable fulcrum 24, which extends upwardly through a central opening in the said plate. The stem of the fulcrum is screw-threaded and passes through an opening in the bracket. On the stem of the fulcrum and on opposite sides of the bracket are the nuts 25 for clamping the bracket and holding the fulcrum in its adjustments.

Clamping-jaws 26 are pivoted as their lower ends to the upper end of the fulcrum 24. The free end of each jaw is wedge shape and has a lateral extension 27. The face of the jaw is protected against wear by the hardened steel plate 28, and in the face is the recess 29. Each jaw is connected by the link 30 with the lever 31, pivoted at 32 to the top section 3 of the casing. The lower end of the lever 31 is turned inwardly and extends transversely across the top section, which is recessed for the purpose, and is connected by the link 33 with an end of the cross-head 5. The connection between the link and the cross-head is the pin 34, to which the link is hinged and which passes through the cross-head and is adjustably held therein by the clamping-nuts 35 on the same and on opposite sides of the cross-head.

By means of the adjustable fulcrum 24 the jaws can be relatively adjusted so as to vary the distance which they will open and close to accommodate clips of different sizes. By means of the pins 34 and their clamping-nuts 35 a proper adjustment of the connections between the levers 31 and the cross-head can be secured.

The top of the upper section 3 of the supporting-casing forms the work-table. Secured to an edge of the same is the bracket 36 in line with the clamping-jaws 26. This bracket serves to support the free end of the hose while the clip is being applied.

The operation of the machine is as follows: The end of the hose into which the coupling-piece 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 29 in either of the clamping-jaws. The other end of the hose is supported by the bracket 36. After the hose has been placed in position the three-way valve 19 is turned so that the induction-port 20 completes the passage through the supply-pipe 17, so that the compressed air can enter

the cylinder. As the air enters the cylinder the piston is forced downward with a comparatively slow movement against the action of the spring 6. 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 assume its proper position. The arrangement of levers and their connections between the cross-head and the clamping-jaws insure a smooth and even motion of the latter. As the clamping-jaws come together the folded part *e* of the tongue registers with one of the recesses 29, and consequently no undue strain will be brought to bear 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 extensions 27 on the jaws and the comparatively large recesses 29 in the faces of the jaws. By having recesses in both jaws the clips can be placed with the folded part of their tongue on either side of the hose.

After the clip has been secured the three-way valve 19 is turned so that its eduction-port 21 registers with the cylinder member of the pipe 17, and thereby forms a continuous passage from the cylinder to the exhaust-pipe 18, through which the compressed air can escape. As the eduction-port is comparatively large, the cylinder will be quickly freed of the compressed air, and the spring 6, operating through the intervening mechanism, will quickly set the clamping-jaws for the next operation.

While the invention has been described as being adapted to a particular form of clip, it is obvious that it can be applied to clips having other forms.

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

1. In a clip-applying machine, an adjustable fulcrum, clamping-jaws pivoted on said fulcrum, pivoted levers connected with said clamping-jaws, a cross-head connected with said levers, and means for moving said cross-head to operate said clamping-jaws.

2. In a clip-applying machine, an adjustable fulcrum, clamping-jaws pivoted on said fulcrum, pivoted levers connected with said clamping-jaws, a cross-head adjustably connected with said levers, and means for mov-

ing said cross-head to operate said clamping-jaws. 65

3. In a clip-applying machine, an adjustable fulcrum, clamping-jaws pivoted on said fulcrum, pivoted levers connected with said clamping-jaws, a cross-head connected with said levers, a spring pressing on said cross-head to move the latter to open said clamping-jaws, and means for moving said cross-head against the action of said spring to close said clamping-jaws. 70 75

4. In a clip-applying machine, an adjustable fulcrum, clamping-jaws pivoted on said fulcrum, pivoted levers connected with said clamping-jaws, a cross-head connected with said levers, a spring pressing on said cross-head to move the latter to open said clamping-jaws, a cylinder, a piston in said cylinder and connected with said cross-head, and means for admitting a fluid under pressure into said cylinder to move said piston to close said clamping-jaws against the action of said spring. 80 85

5. In a clip-applying machine, an adjustable fulcrum, clamping-jaws pivoted on said fulcrum, pivoted levers connected with said clamping-jaws, a cross-head connected with said levers, a spring pressing on said cross-head to move the latter to open said clamping-jaws, a cylinder, a piston in said cylinder and connected with said cross-head, means for slowly admitting a fluid under pressure into said cylinder to move said piston to close said clamping-jaws against the action of said spring, and means for quickly exhausting the compressed fluid from the cylinder to allow said spring to open said clamping-jaws. 90 95 100

6. In a clip-applying machine, an adjustable fulcrum, clamping-jaws pivoted on said fulcrum, pivoted levers connected with said clamping-jaws, a cross-head connected with said levers, a spring pressing on said cross-head to move the latter to open said clamping-jaws, a cylinder, a piston in said cylinder and connected with said cross-head, an induction-pipe leading to said cylinder, an exhaust-pipe leading from said cylinder, and a valve provided with a comparatively small ingress-port and a comparatively large egress-port controlling the passages through said induction and exhaust pipes. 105 110 115

7. In a clip-applying machine, a support, clamping-jaws pivoted on said support, levers pivoted to said support, links connecting said levers with said clamping-jaws, a cross-head, links adjustably connecting said levers with said cross-head to vary the relative movement of said clamping-jaws, and means for moving said cross-head to operate said clamping-jaws. 120

8. In a clip-applying machine, a support, clamping-jaws pivoted on said support, levers pivoted to said support, links connecting said levers with said clamping-jaws, a cross-

head, pins adjustable in said cross-head; links hinged to said pins and connected with said levers, and means for moving said cross-head to operate said clamping-jaws.

5 9. In a clip-applying machine, a support, a fulcrum adjustably mounted on said support, clamping-jaws pivoted on said fulcrum, levers pivoted to said support, links connecting said levers with said clamping-jaws, a
10 cross-head, links adjustably connecting said levers with said cross-head to vary the relative movement of said clamping-jaws, and means for moving said cross-head to operate said clamping-jaws.

15 10. In a clip-applying machine, a support, a fulcrum adjustably mounted on said support, clamping-jaws pivoted on said fulcrum, levers pivoted to said support, links connecting said levers with said clamping-jaws, a
20 cross-head, pins adjustable in said cross-head, links hinged to said pins and connected with said levers, and means for moving said cross-head to operate said clamping-jaws.

25 11. In a clip-applying machine, a support, clamping-jaws pivoted on said support, levers pivoted to said support, links connecting said levers with said clamping-jaws, a cross-head, links adjustably connecting said levers with said cross-head to vary the relative
30 movement of said clamping-jaws, a spring pressing on said cross-head to move the latter to open said clamping-jaws, a cylinder, a piston in said cylinder and connected with said cross-head, means for admitting a
35 fluid under pressure into said cylinder to move said piston to close said clamping-jaws.

40 12. In a clip-applying machine, pivoted clamping-jaws, lateral extensions on said clamping-jaws, and means for operating said jaws.

45 13. In a clip-applying machine, pivoted clamping-jaws with one or both of the same provided with a recess in its face, and means for operating said clamping-jaws.

50 14. In a clip-applying machine, pivoted clamping-jaws having hardened faces and one or both of the jaws having a recess in its face, lateral extensions on said jaws, and means for operating said jaws.

15. In a clip-applying machine, pivoted

clamping-jaws relatively adjustable to each other to accommodate articles of different sizes, and mechanism operating said clamping-jaws to give a comparatively slow closing movement and a comparatively quick opening movement of the same.

16. In a clip-applying machine, an adjustable fulcrum, clamping-jaws pivoted on said fulcrum, and mechanism operating said clamping-jaws to give a comparatively slow closing movement and a comparatively quick opening movement of the same.

17. In a clip-applying machine, pivoted clamping-jaws relatively adjustable to accommodate articles of different sizes, pivoted levers connected with said clamping-jaws, a cross-head, links adjustably connecting said levers with said cross-head to vary the relative movement of said clamping-jaws, and means for moving said cross-head to give a comparatively slow closing movement and a comparatively quick opening movement of said clamping-jaws.

18. In a clip-applying machine, pivoted clamping-jaws relatively adjustable to each other with one of them provided with a recess in its face, and means for operating said clamping-jaws to give a comparatively slow closing movement and a comparatively quick opening movement of the same.

19. In a clip-applying machine, pivoted clamping-jaws relatively adjustable to each other, lateral extensions on said clamping-jaws, and means for operating said clamping-jaws to give a comparatively slow closing movement and a comparatively quick opening movement of the same.

20. In a clip-applying machine, pivoted clamping-jaws relatively adjustable with one of them provided with a recess in its face, lateral projections on said clamping-jaws, and means for operating said clamping-jaws to give a comparatively slow closing movement and a comparatively quick opening movement of the same.

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

WILLIAM A. WALKER.

Witnesses:

HANCE W. B. REID,
SAML. K. P. DOWNEY.