

(No Model.)

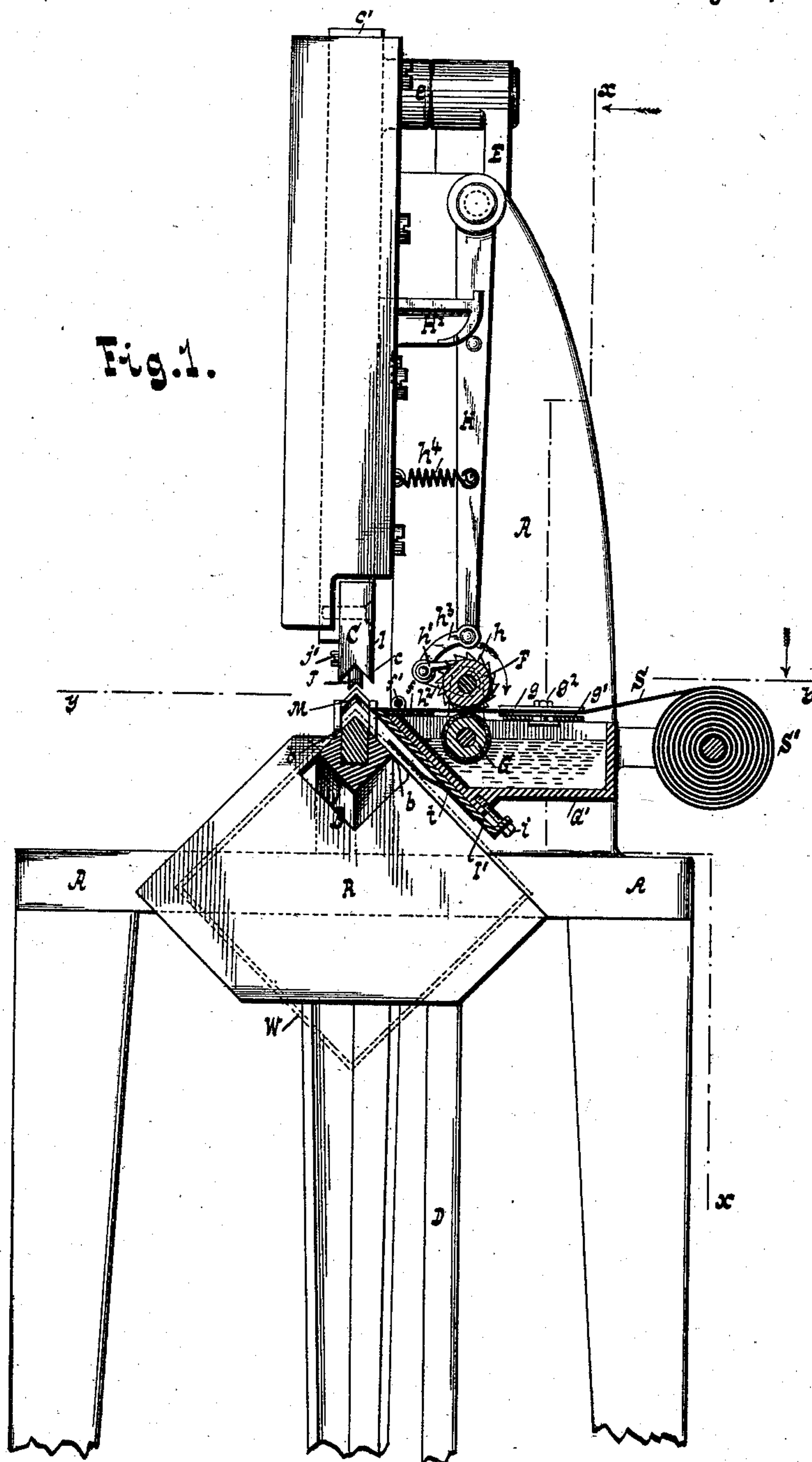
6 Sheets—Sheet 1.

G. L. JAEGER.

MACHINE FOR APPLYING FASTENING STRIPS TO BOXES.

No. 406,736.

Patented July 9, 1889.



WITNESSES:

Attest: der Taufz.
William Miller

INVENTOR:

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.BY

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his ATTORNEYS

(No Model.)

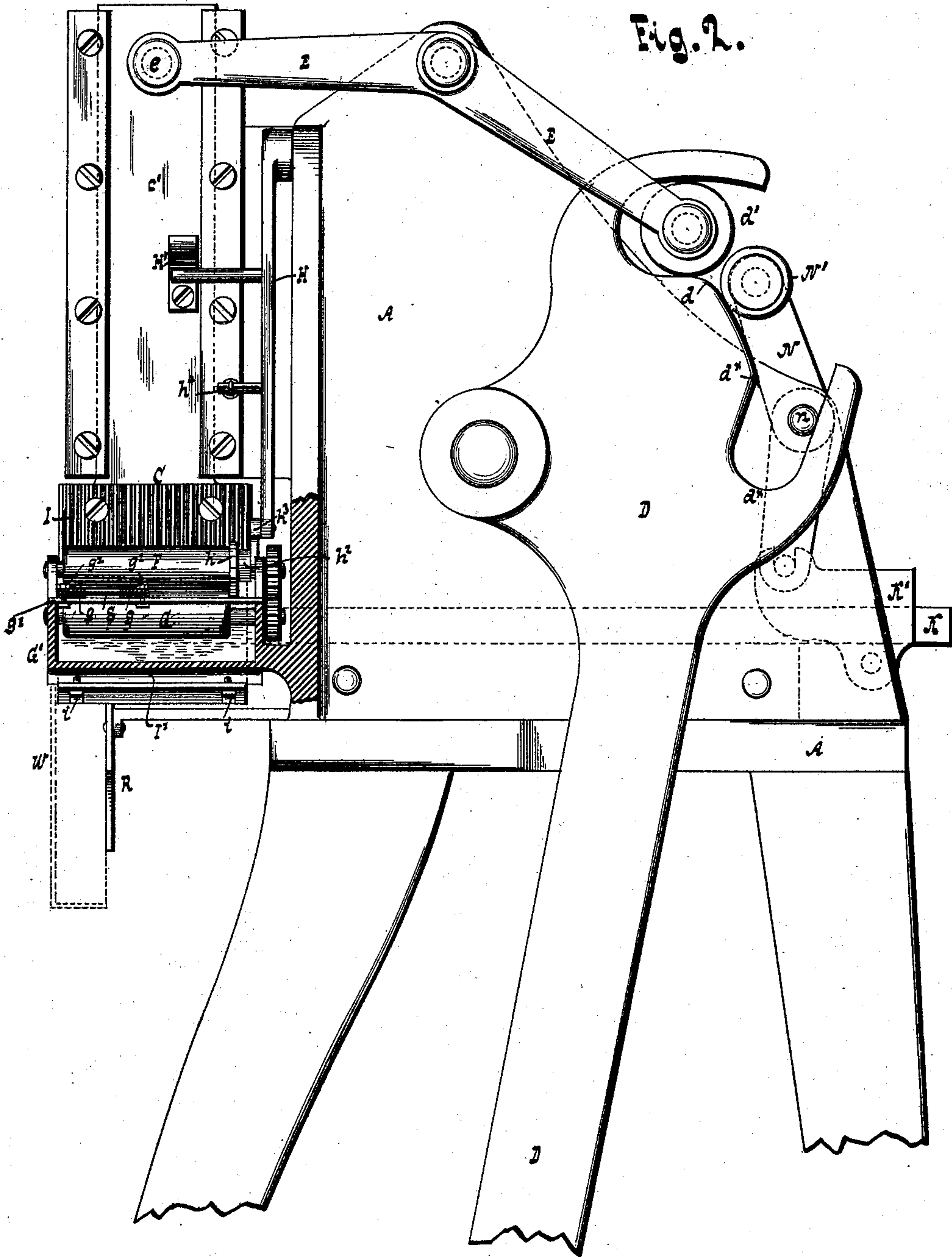
6 Sheets—Sheet 2.

G. L. JAEGER.

MACHINE FOR APPLYING FASTENING STRIPS TO BOXES.

No. 406,736.

Patented July 9, 1889.



WITNESSES:

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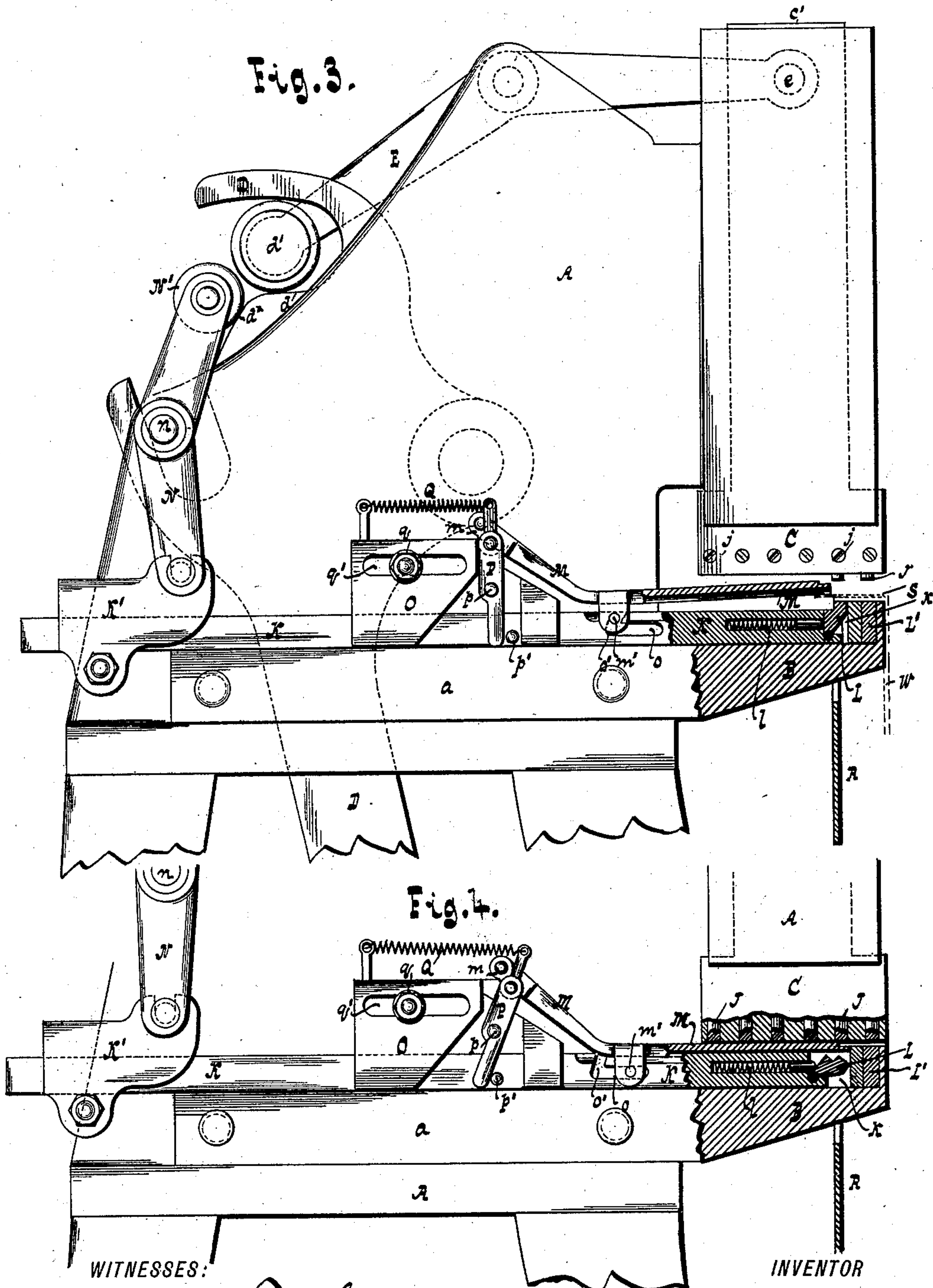
6 Sheets—Sheet 3.

G. L. JAEGER.

MACHINE FOR APPLYING FASTENING STRIPS TO BOXES.

No. 406,736.

Patented July 9, 1889.



WITNESSES:
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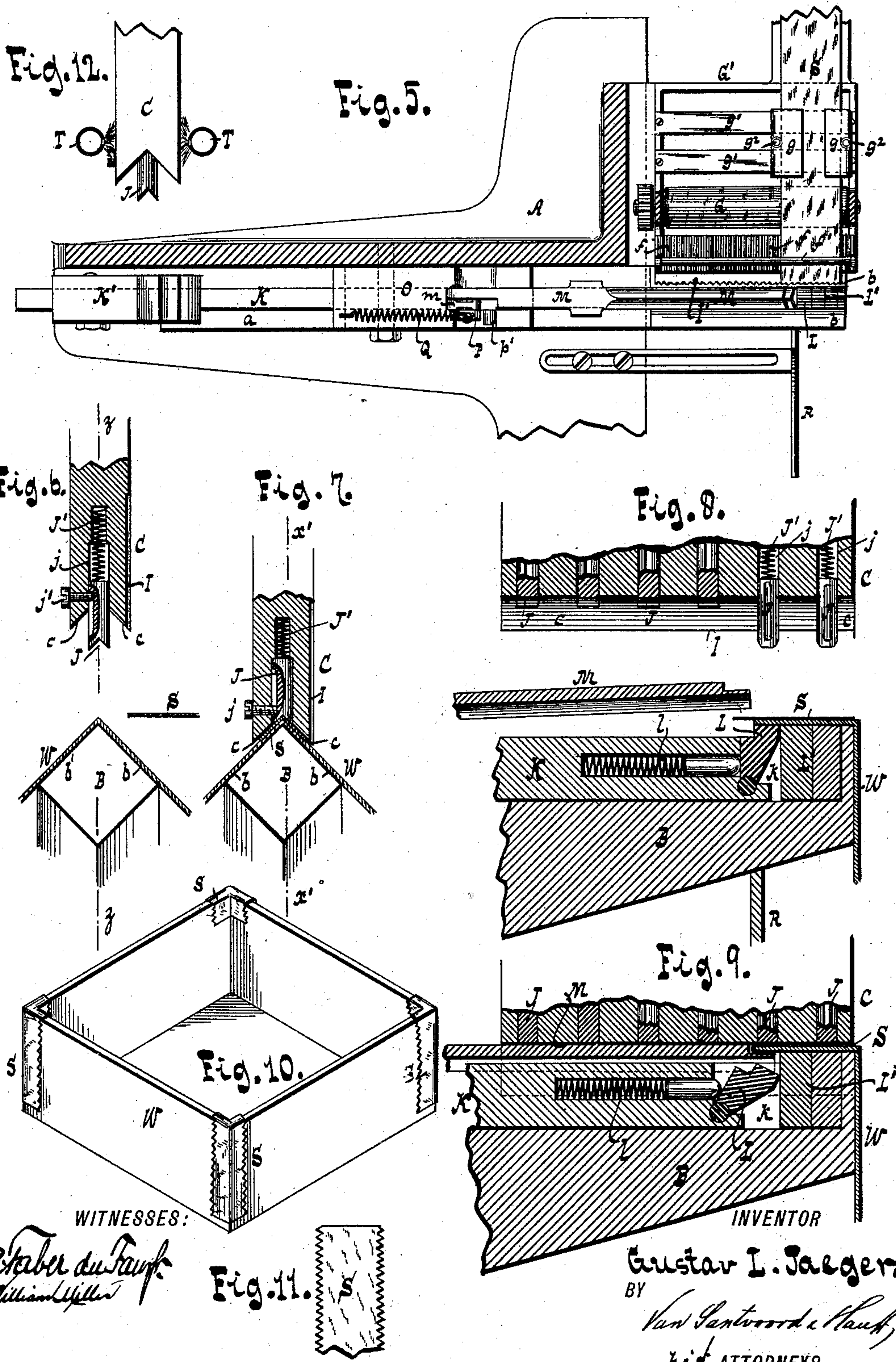
6 Sheets—Sheet 4.

G. L. JAEGER.

MACHINE FOR APPLYING FASTENING STRIPS TO BOXES.

No. 406,736.

Patented July 9, 1889.



WITNESSES:

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Fig. 11.



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(No Model.)

6 Sheets—Sheet 5.

G. L. JAEGER.

MACHINE FOR APPLYING FASTENING STRIPS TO BOXES.

No. 406,736.

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Fig. 13.

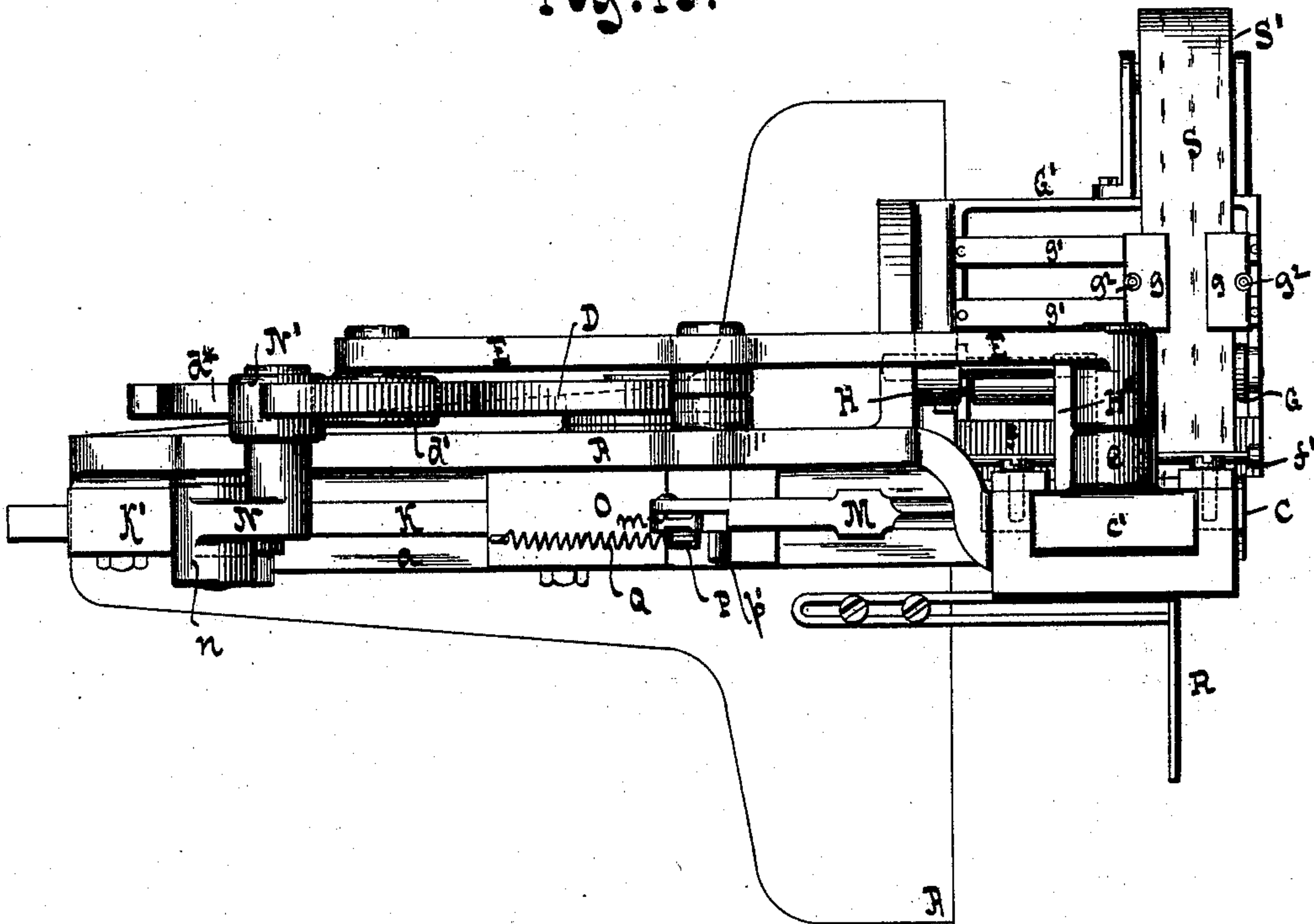


Fig. 14*.

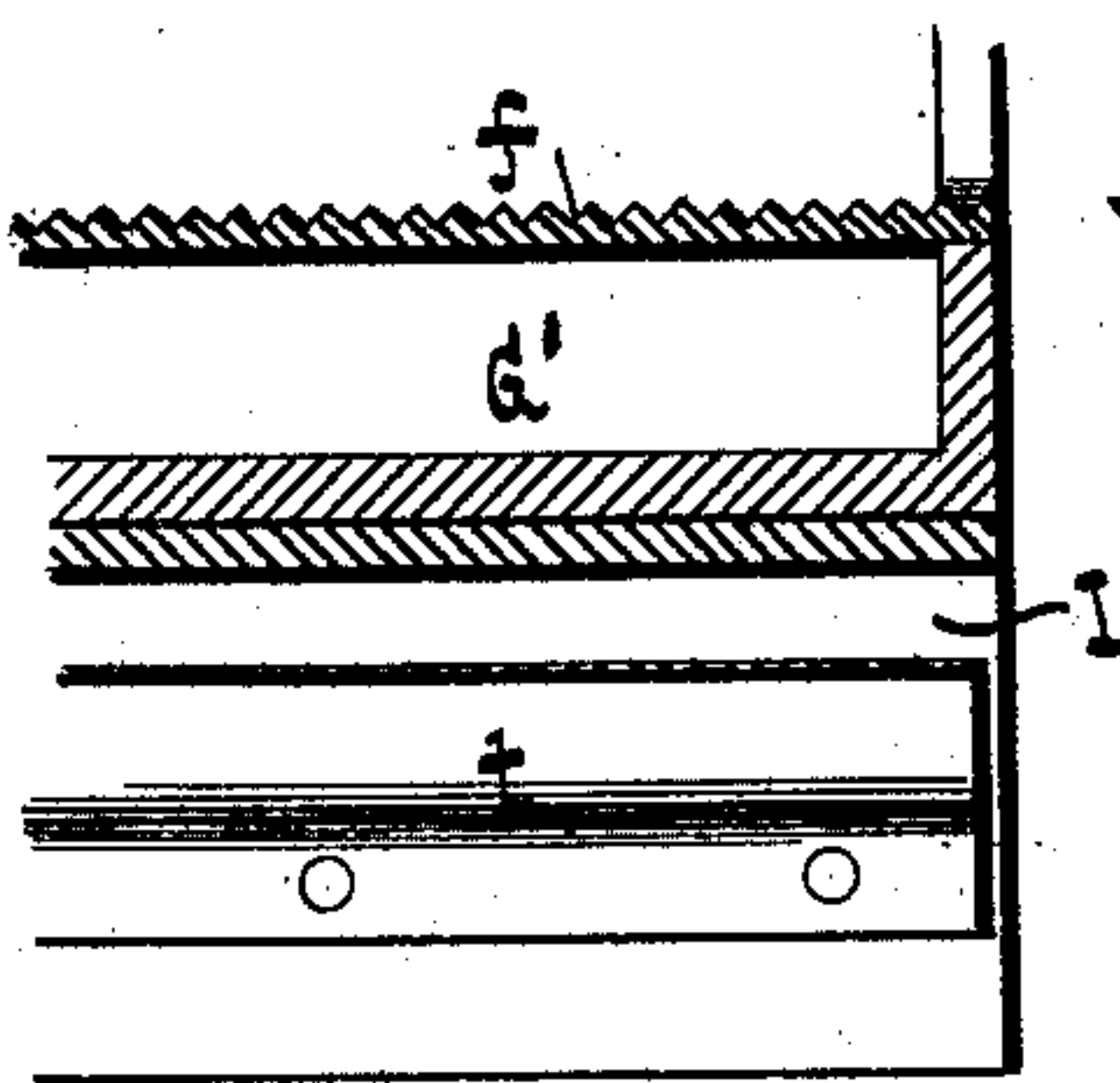
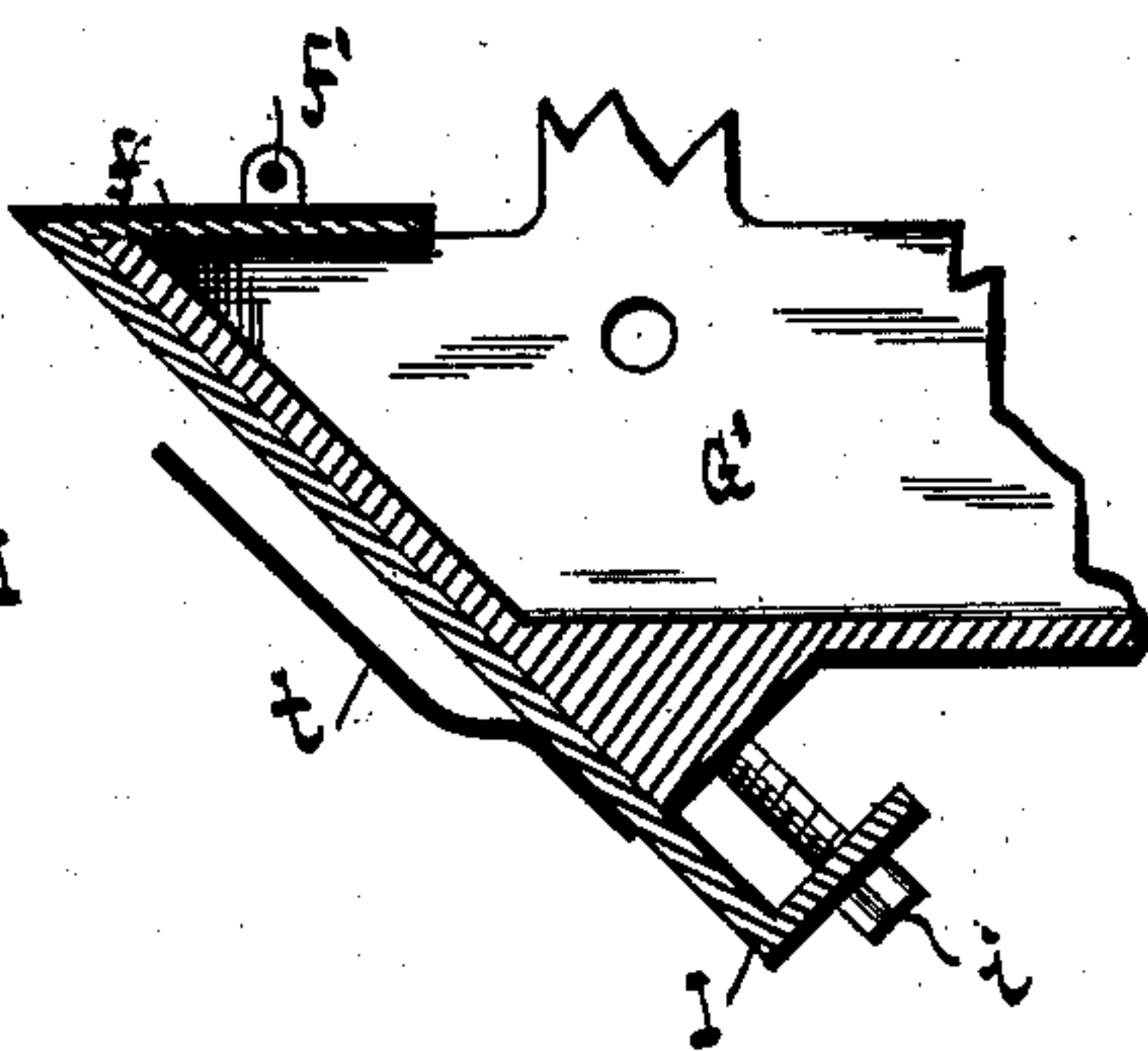


Fig. 14.



WITNESSES:

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(No Model.)

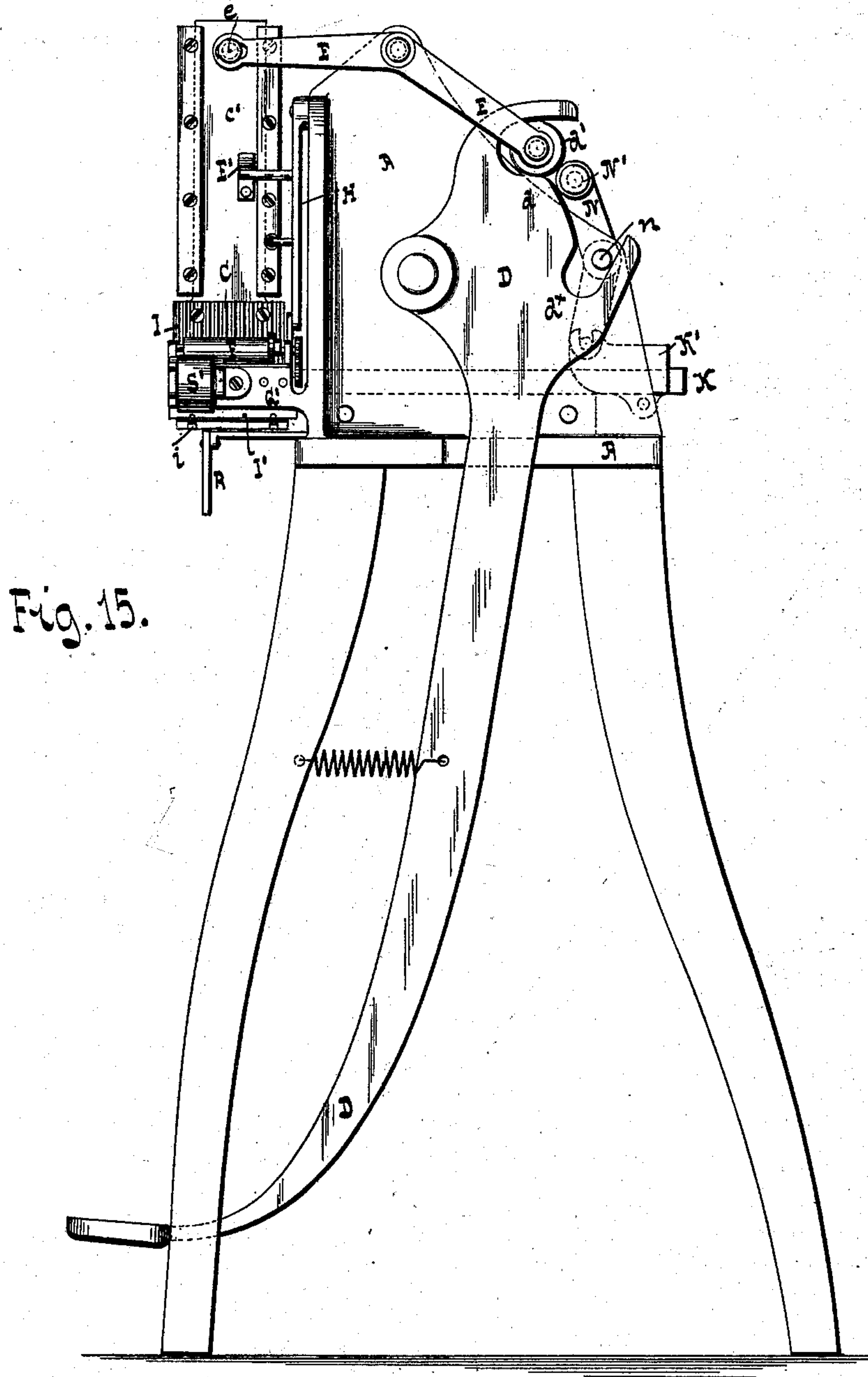
6 Sheets—Sheet 6.

G. L. JAEGER.

MACHINE FOR APPLYING FASTENING STRIPS TO BOXES.

No. 406,736.

Patented July 9, 1889.



WITNESSES:

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UNITED STATES PATENT OFFICE.

GUSTAV L. JAEGER, OF NEW YORK, N. Y.

MACHINE FOR APPLYING FASTENING-STRIPS TO BOXES.

SPECIFICATION forming part of Letters Patent No. 406,736, dated July 9, 1889.

Application filed January 26, 1888. Serial No. 282,005. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV L. JAEGER, a citizen of the United States, residing at New York, in the county and State of New York, have invented new and useful Improvements in Machines for Applying Fastening-Strips to Boxes, of which the following is a specification.

My invention has for its object to provide novel mechanism for applying adhesive fastening strips or stays to the corners of boxes; and to such end the invention consists in the features and combination of devices, hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 represents a sectional front elevation of a machine embodying my invention. Fig. 2 is a vertical section thereof in the plane $x x$, Fig. 1. Fig. 3 is a sectional side elevation. Fig. 4 is a similar view of a portion of the machine, showing the folding device in a position differing from that shown in Fig. 3. Fig. 5 is a horizontal section in the plane $y y$, Fig. 1. Fig. 6 is a sectional elevation of the box support and die, showing the same in the receiving positions, said figures being drawn to a larger scale than the preceding figures. Fig. 7 is a similar view showing the die down upon the box. Fig. 8 is a vertical section in the plane $z z$, Fig. 6. Fig. 9 is a vertical section in the plane $x' x'$, Fig. 7. Fig. 10 is a perspective view of a box having the fastening-strips applied. Fig. 11 is a face view of a portion of a strip. Fig. 12 is an elevation of the die, showing means for heating the same. Fig. 13 is a plan view similar to Fig. 5, but without any parts being cut away. Fig. 14 is a sectional side view of a trough and a corrugated table. Fig. 14* is a transverse sectional view of Fig. 14. Fig. 15 is a side elevation of a machine.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates a frame suitably constructed to support the operating parts of the machine. B is the box-support, which is provided with a shank a for securing it to the frame. The faces $b b$ of the box-support diverge and form an angle of ninety degrees with each other, so that the corner of the box W, which is placed upon the same, will receive a proper support.

The die C is located directly above the box-support B, and is provided with diverging cheeks $c c$, corresponding to those of the box-support. The die is movable toward and from the box-support, its shank c' being guided in vertical ways formed in a portion of the frame. It can be actuated by the use of any suitable mechanism—such, for instance, as that here shown, Figs. 2, 3, and 15—which consists of foot-lever D, having thereon a cam-surface d , upon which rides a roller-stud d' , carried by a lever E, which is in engagement at e with the shank of the die. The foot-lever D may be of any suitable construction, as seen in Fig. 15.

The fastening-strip S has a width corresponding to the depth of the box, and is fed directly between the die and the box-support—that is to say, over the corner of the interposed box W and in a direction perpendicular to the depth of the box-support. In the example shown in the drawings, Figs. 1, 2, 5, 13, and 15, the fastening-strip is drawn from a roll S' by a feed-roll F, which rotates in contact with a moistening-roll G, located within a fount G', the shafts of both rolls F and G having bearings in suitable boxes on the fount G'.

In practice I make use of a strip S, which has been previously provided with a dry coating of mucilage or other suitable adhesive, which is moistened to render the strip adhesive by the moistening-roll G, the fount G' being supplied with water. To guide the strip between the roll S' and the feed-roll, I provide suitable guides $g g$, which are laterally adjustable upon supports $g' g'$ to adapt them to any particular width of strip. Set-screws $g^2 g^2$ are provided to fix the guides when properly set.

The fastening-strip on leaving the rolls is supported upon a table f , Figs. 1, 5, 13, 14, and 14*, which is located on such a level that the fastening-strip when fed forward passes directly over the corner of the interposed box W, Fig. 1. The table is corrugated or its upper surface is provided with linear projections or ridges, Figs. 5, 14, and 14*, so that but a small portion thereof will come into contact with the adhesive surface of the fastening-strip, and consequently the strip will not adhere to the table. A bar f' , extending

above and across the table *f*, prevents the strip from rising. The table *f* is shown in Figs. 5, 13, 14, and 14* as having corrugations or ridges.

5 The feed-roll F is intermittently rotated by any suitable connection with a moving part of the machine. In the example shown in the drawings, Figs. 1 and 2, I make use of the following means: On the shaft of the feed-
10 roll is rigidly secured a ratchet-wheel *h*, which is engaged by a pawl *h'*, pivoted to an arm *h²*, loosely pivoted on the feed-roll shaft. The arm *h²* is connected by a link *h³* with a lever H, pivoted to the frame. This lever is vi-
15 brated in one direction by a cam *H'*, secured to the shank of the die C, and a spring *h⁴* moves it in the opposite direction.

It will be noticed that when the die C descends the lever H is swung outward and the
20 feed-roll F is turned in the direction of the arrow marked near it in Fig. 1 to feed the strip forward over the corner of the box. On the reverse movement of the die the pawl *h'* passes over the teeth of the ratchet-wheel
25 and the feed-roll remains stationary. The shaft of the moistening-roll G is connected with the shaft of the feed-roll F by suitable gears, Fig. 2.

To sever the strip S into suitable lengths I
30 make use of a cutter I. This cutter can be of any suitable construction and operation. In the example shown in the drawings, Figs. 1, 2, 6, and 7, I have formed the same integral with and directly on one side of the die. It
35 could, however, be made separate from the die and secured thereto. This cutter I severs the strip S into suitable lengths in co-operation with a blade *I'*, which is secured to the fount *G'*, and is made adjustable by the
40 set-screws *i*, Figs. 1, 2, 14, and 15. Its upper edge extends parallel to the cutter.

In order that the strip may not be torn or distorted by the cutter, I serrate or flute the
45 surface of the latter at the lower portion thereof or throughout its entire depth, and serrate or flute the edge of the blade *I'* to correspond therewith, Figs. 2, 5, 6, and 7. These serrations also improve the appearance of the fastening-strip. (See Figs. 10 and 11.)

50 It will be noticed that the strip S is supported on one side upon the blade *I'* while being severed; but in order to support it on the opposite side and also to hold the severed length firmly and truly upon the box I
55 make use of a suitable yielding clamp J, which is fitted in the die C, and engages with the strip slightly in advance of the cutter I and holds it firmly to the box.

In the example shown in the drawings, Figs.
60 6, 7, 8, and 9, a number of such clamps J are applied in the depth of the die C. Each clamp is fitted loosely in a vertical recess *j* in the die, and its inner end is engaged by a spiral spring *J'*, which tends to force it downward or out-
65 ward from the die to the position shown in Figs. 6 and 8, in which position its movement

is arrested by a stop *j'*, Figs. 6 and 7, which may be a screw engaging a longitudinal slot in the clamp. In the outer end of the clamp
70 is formed a groove, the sides of which correspond in inclination to the inclination of the sides of the box. As the die descends one or more of the clamps, as the case may be, en-
75 gages with the strip S and holds it firmly to the corner of the interposed box while the cutter I is in action. During the movement of the die C, subsequent to the engagement of the strip S by the clamp J, the clamp yields
80 until its outer end lies flush with the faces *c c* of the die C. In this position its inner end engages with the end of the recess *j*, and the clamp consequently forms an unyielding and operative portion of the die when the said die
85 is in engagement with the strip, Figs. 7 and 9. It is evident that a single clamp J, extending across the depth of the die, could be used in
90 place of the several clamps shown.

In many instances it is desirable to turn over and lay one end of the fastening-strip S in the interior of the box, as shown in Fig. 10.
95 To adapt the machine for this purpose also I provide a folding device which can be brought into use when so desired, and the fastening-strip, fed by the feed-roll, is wide enough to permit a portion of the same to overlap the
100 top of the box.

Referring to Figs. 3, 4, 5, 8, and 9, the box-support B is slotted or provided with a central longitudinal recess *k*, to permit the intro-
105 duction of a horizontally-movable slide K, on the inner end of which is a supporting-segment L, which is pivoted to the slide and is engaged by a spiral spring *l*, coiled in a longitudinal recess in the slide. The spring
110 tends to turn the supporting-segment about its pivot, and, if desired, a suitable follower may be placed between the spring and supporting-segment. The top of the supporting-
115 segment is roof-shaped to correspond to the support B. When the slide is in its forward position, the supporting-segment abuts against the end of the recess *k*, Figs. 3 and 8, and forms a support for the portion of the box
120 above the same, whereby the continuity of the box-support is preserved; but when said slide is withdrawn, Figs. 4 and 9, the spring *l* turns the supporting-segment about its pivot, and a
125 portion of the box-corners is left unsupported.

The folder M is located above the slide K, and is provided with inclined faces corre-
130 sponding to those of the box-support B. It engages with the portion of the strip which overhangs the top of the box and bends or turns it downward, and then by a forward or translatory movement lays it upon the
135 interior of the box. During the forward movement of the folder the slide K withdraws and the supporting-segment turns about its pivot, thereby making room for the passage of the folder beneath the top corner
140 of the box. In this manner the box-corner is supported throughout its depth while un-

der the action of the die, while subsequently a portion of the same is free for the turning over of the fastening-strip.

Any suitable means can be employed for
 5 actuating the folder and slide. In the example shown in the drawings, Figs. 3, 5, and 13, the slide K is guided in a suitable box O, and its rear end is engaged by one end of a lever N, Figs. 3, 13, and 15, which is pivoted at *n* to
 10 the frame A of the machine, and carries on its free end a roller-stud N', which rides upon a cam-face *d**, formed on the foot-lever D. On inspection of this cam-surface and that for actuating the die it will be seen that
 15 the lever N is not actuated to withdraw the slide K until the downward movement of the punch is completed, after which the punch remains stationary and the slide is withdrawn. The folder M is in the form of an
 20 arm or lever, and its rear end is connected by a link *m* with a lever P, pivoted at *p* to the box O. A pin *p'* on the slide K engages the free end of the lever P as the slide is withdrawn, and moves the folder M forward. The
 25 folder is connected at or near its central portion with the slide K by a pin *m'* and slot *o*, connection which steadies the folder. A slot *o'*, intersecting the slot *o*, allows the folder to reach its elevated position, Fig. 3, in which
 30 it normally is retained by a spring Q, which is connected at one end to the lever P and at the other end to a standard on the box O. The descending die C engages with and vibrates the folder M, forcing it downward
 35 upon the overlapping portion of the fastening-strip, whereupon it is moved forward, as best seen in Fig. 9, to fold in the said overlapping end. It will be noticed that the extreme free end of the folder is recessed to permit the same to pass into the box.

It not being desirable that the clamps J should engage the folder, such of the same as would engage with the same on the downward stroke of the die can be raised flush
 45 with the punch, as shown in Fig. 8, and fixed in this position by means of screws *j'*, Figs. 6 and 7.

A gage R, which is adjustable by means of a slot and screw connection with the frame A
 50 of the machine, Figs. 1, 2, 5, 13, and 15, is used, so that the box can be readily placed in the correct position on the support. This gage is in the form of a plate, Fig. 1, and serves also to steady the box.

The gage-plate R is to be fixed in a stationary position after being adjusted to the correct position to serve as an abutment for the edges of the box on the angular support. For such purpose the connection of the gage-plate
 55 with the main frame is through the medium of the horizontal arm having a longitudinal slot through which the fastening-screws pass into the main frame, as clearly shown in Fig. 5.

A presser-plate *t*, secured to the blade I' or
 65 to the fount G', Figs. 1, 14, and 14*, holds the box firmly against the support.

With boxes of different depths it is obvious that the folding mechanism must be set accordingly, and in view of this I have made the same adjustable.

Referring to Figs. 3, 4, and 5, it will be seen that the box O is adjustable horizontally by means of a bolt *q* and slot *q'* connection with the frame A. For a deep box the box O is moved
 70 backward until the folder comes into the correct position to engage with the overlapping end of the fastening-strip. The slide K is moved back correspondingly, and the dog K' thereon, which is engaged by the lever N, is set to remain in engagement with the said lever.
 80 The space of the recess *k*, Figs. 3, 4, 5, 8, and 9, remaining between the segment L and the end of the recess is filled out by filling-blocks L', which fit the recess and have roof-shaped tops to correspond with the box-support, whereby the continuity of the support
 85 is preserved.

If the fastening-strip is coated on one side with colophonium or similar adhesive which can be softened by heat, the punch is heated
 90 by any suitable means. In Fig. 12 I have shown perforated gas-pipes TT on both sides of the punch for directing a number of jets on the said punch.

What I claim as new, and desire to secure
 95 by Letters Patent, is—

1. The combination, with a die and a recessed support co-operating to lay a fastening-strip upon the exterior of the corner of an interposed box, of the slide K, extending into
 100 the recess in the support, a supporting-segment L, connected with said slide, and a folder M, moving in a direction opposite to said slide for laying the overlapping portion of the strip in the interior of the corner of the box, substantially as shown and described.

2. The combination, with a die and a recessed support co-operating to lay a fastening-strip upon the exterior of the corner of an interposed box, of the slide K, extending into
 110 the recess in the support, a spring-pressed supporting-segment L, pivoted to the slide, and a folder M for laying the overlapping portion of the fastening-strip in the interior of the corner of the box, substantially as shown and
 115 described.

3. The combination, with a die and a recessed support co-operating to lay the fastening-strip upon the exterior of the corner of the interposed box, of a reciprocating slide
 120 extending into the recess in the support, a supporting-segment connected with the interior end of the slide, and a folder having a transitory and oscillatory movement, substantially as shown and described.

4. The combination, with a die and a recessed support co-operating to lay the fastening-strip upon the exterior of the corner of the interposed box, of a slide extending into
 130 the recess in the support, a spring-pressed supporting-segment connected with the interior end of the slide, a folder M, a link-le-

ver and pin connection of the same with the slide, the foot-lever D, having a cam-surface d' , and a lever N, having a roller-stud N', engaging said surface d' , said lever being connected with the slide, substantially as shown and described.

5. The combination, with a vertically-reciprocating die and a recessed support, of the slide extending into the recess in the support, a supporting-segment connected with the interior end of the slide, and a folder M, said slide and folder being actuated to lay the overlapping end of the strip in the interior of the corner of the box when the die is upon the corner of the box, substantially as shown and described.

6. The combination, with the die and support co-operating to lay the fastening-strip upon the corner of a box, of a yielding clamp in the die, said clamp being provided with diverging faces constructed to hold a strip against the corner of the box while said strip is being severed, substantially as described.

7. The combination, with the die and support co-operating to lay the fastening-strip upon the corner of a box and a yielding clamp fitted into a recess in the die and constructed to hold a strip against the corner of the box while said strip is being severed, of a feeding device, substantially as described, for feeding the strip between the die and support and a cutter for severing the strip, substantially as described.

8. The combination, with the main frame A, the angular box-support B, the reciprocating die C, and the feeding and cutting devices, substantially as described, of the vertical gage R, fitting upon and movable along the length of the box-support, serving as an

abutment for the edges of a box and provided with an attached horizontal arm resting on the main frame, and having a longitudinal slot lengthwise adjustable and adapted to be rigidly fixed in a stationary position by a screw-connection with said main frame, substantially as described.

9. The combination, with the die and a recessed support co-operating to lay a fastening-strip upon the interior of the corner of an interposed box, of the longitudinally-adjustable slide K, extending into the recess in the support, a supporting-segment L, connected with the slide, and an adjustable folder M, substantially as shown and described.

10. The combination, with a die and a support having diverging faces and co-operating to lay a fastening-strip upon the corner of an interposed box, a cutter, a feeding device, substantially as described, and a folder having a vibratory movement in the direction of the movement of the die and a translatory movement perpendicular to the path of the same, substantially as shown and described.

11. The combination, with a die and a support co-operating to lay a fastening-strip upon a box, of mechanism, substantially as described, for suitably severing and feeding the strip and rendering the same adhesive, and a presser-plate t , made to engage said box, substantially as described.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

GUSTAV L. JAEGER. [L. S.]

Witnesses:

W. C. HAUFF,
E. F. KASTENHUBER.