

(No Model.)

5 Sheets—Sheet 1.

R. J. SHIPLEY.

MACHINE FOR MAKING PAPER FASTENERS.

No. 418,536.

Patented Dec. 31, 1889.

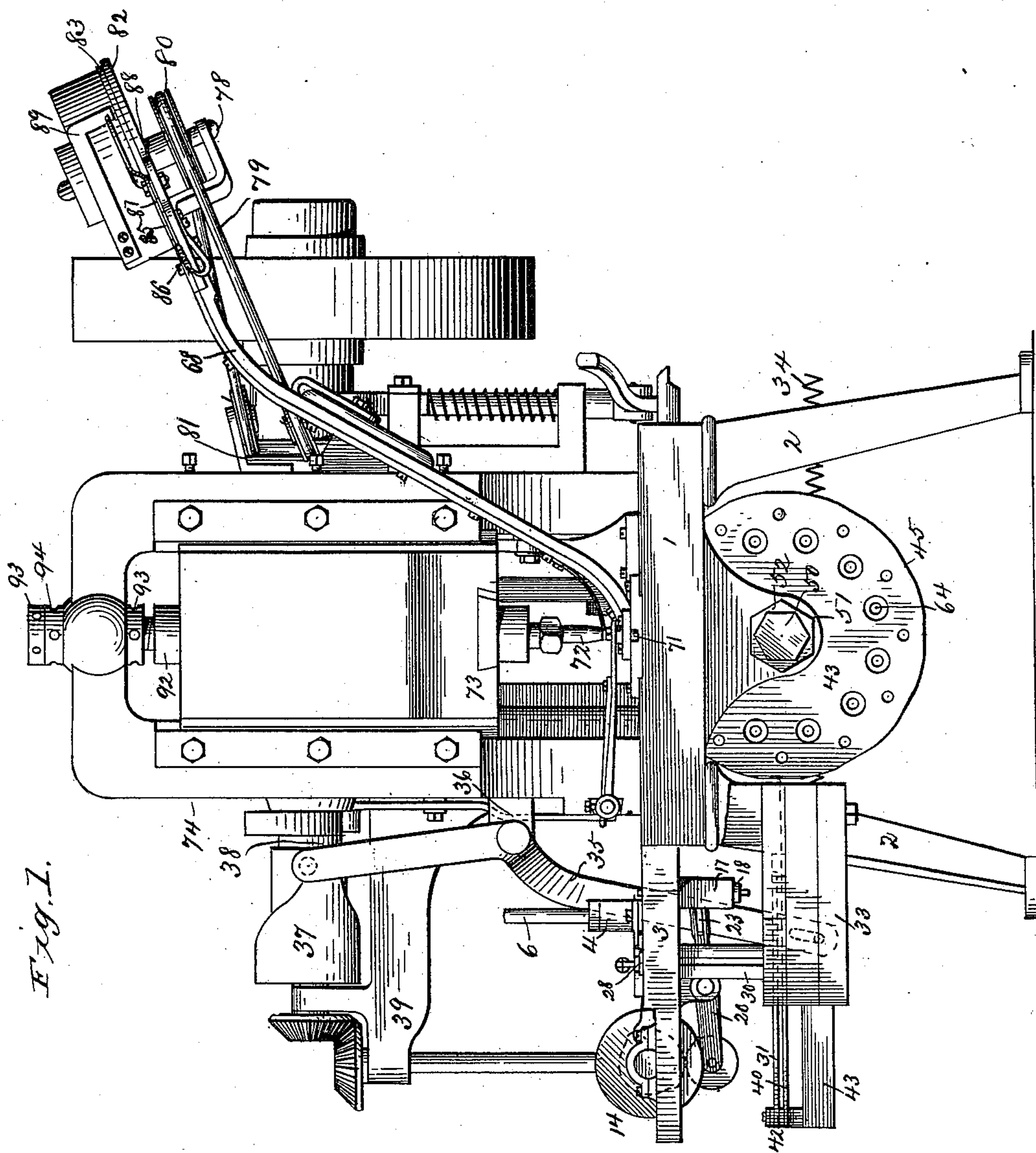


Fig. 1.

Witnesses

E. D. Smith
A. H. Norris

Inventor

Ralph J. Shipley
By his Attorney,
James L. Norris

(No Model.)

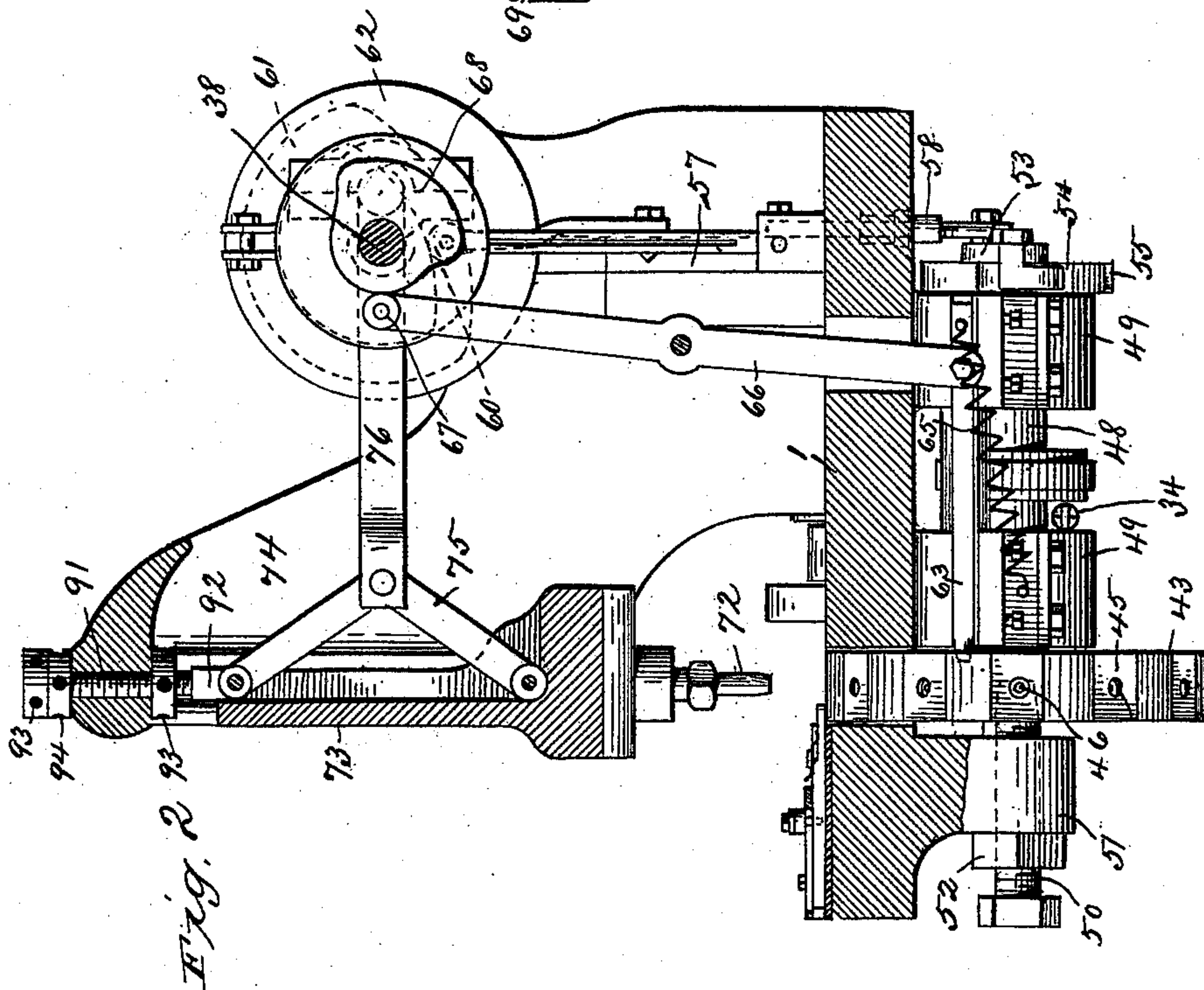
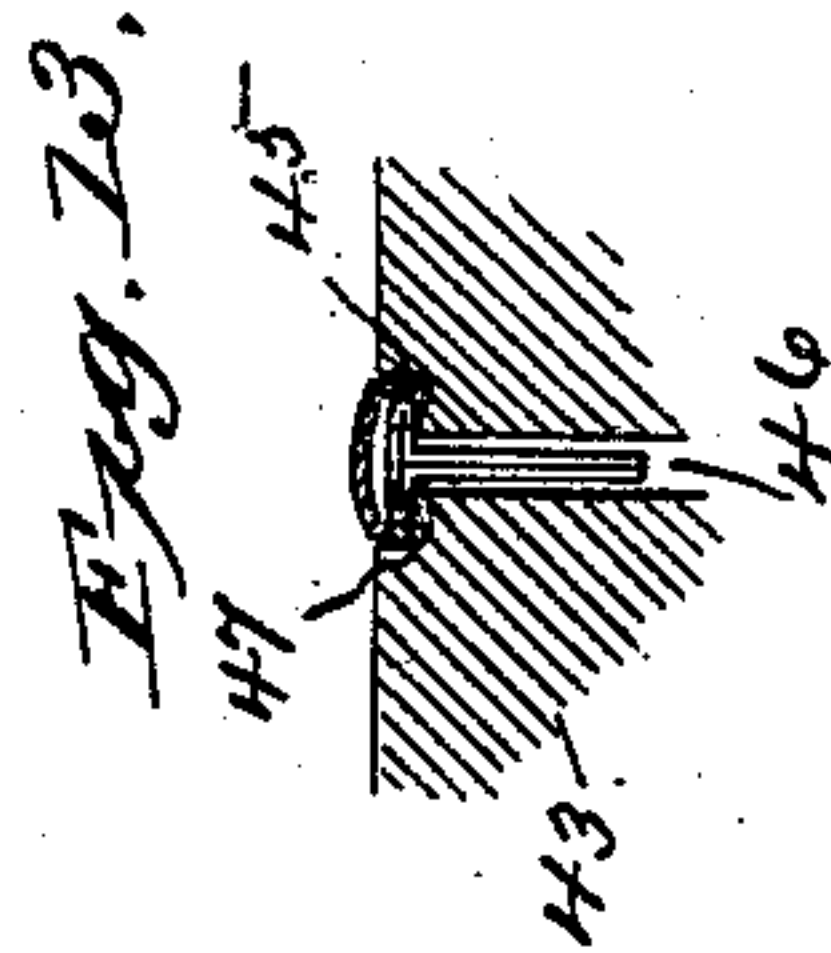
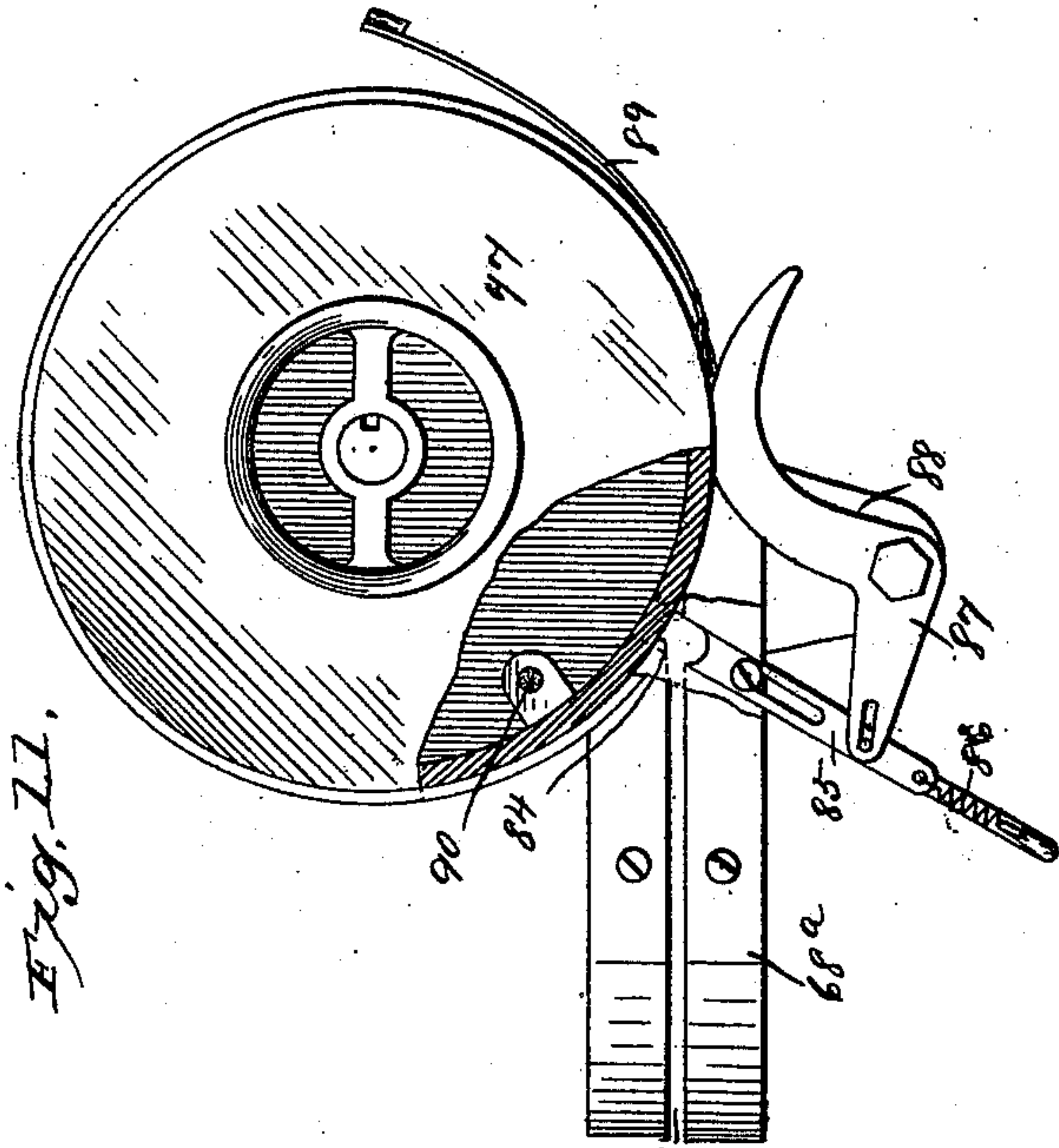
5 Sheets—Sheet 2.

R. J. SHIPLEY.

MACHINE FOR MAKING PAPER FASTENERS.

No. 418,536.

Patented Dec. 31, 1889.



Witnesses
E. D. Smith
A. H. Norris

Inventor
Ralph J. Shipley
By his Attorney
James L. Norris

(No Model.)

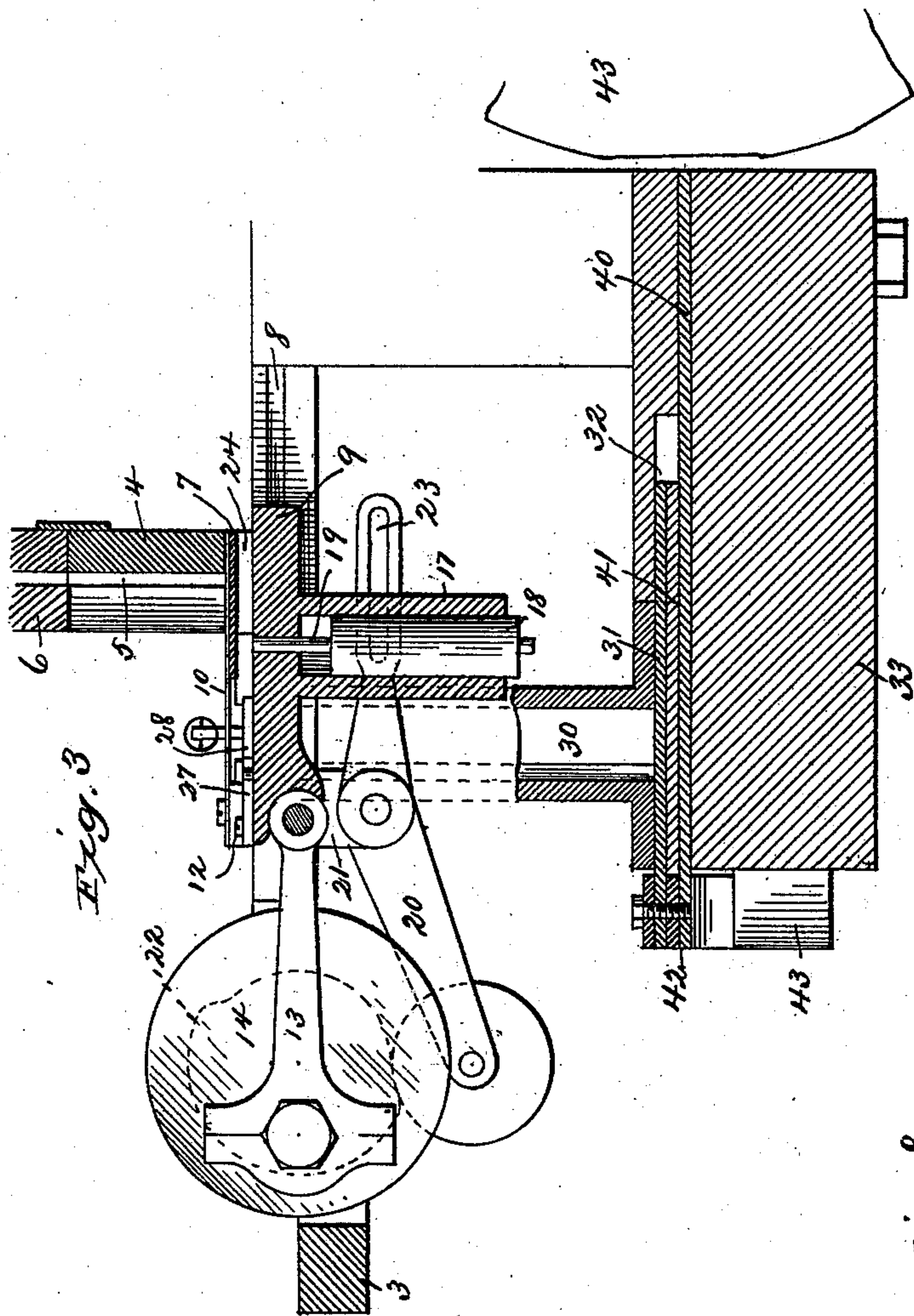
5 Sheets—Sheet 3.

R. J. SHIPLEY.

MACHINE FOR MAKING PAPER FASTENERS.

No. 418,536.

Patented Dec. 31, 1889.



(No Model.)

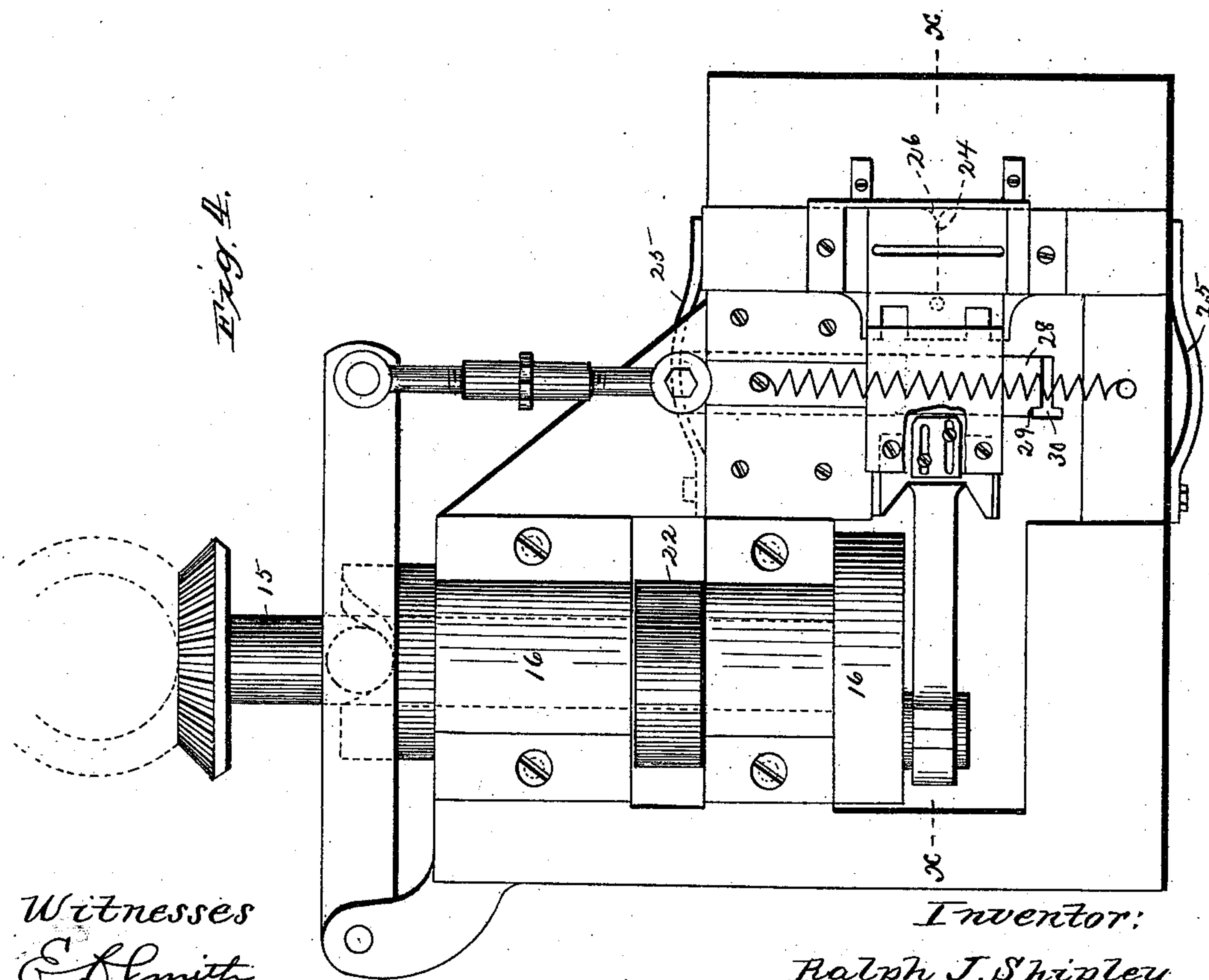
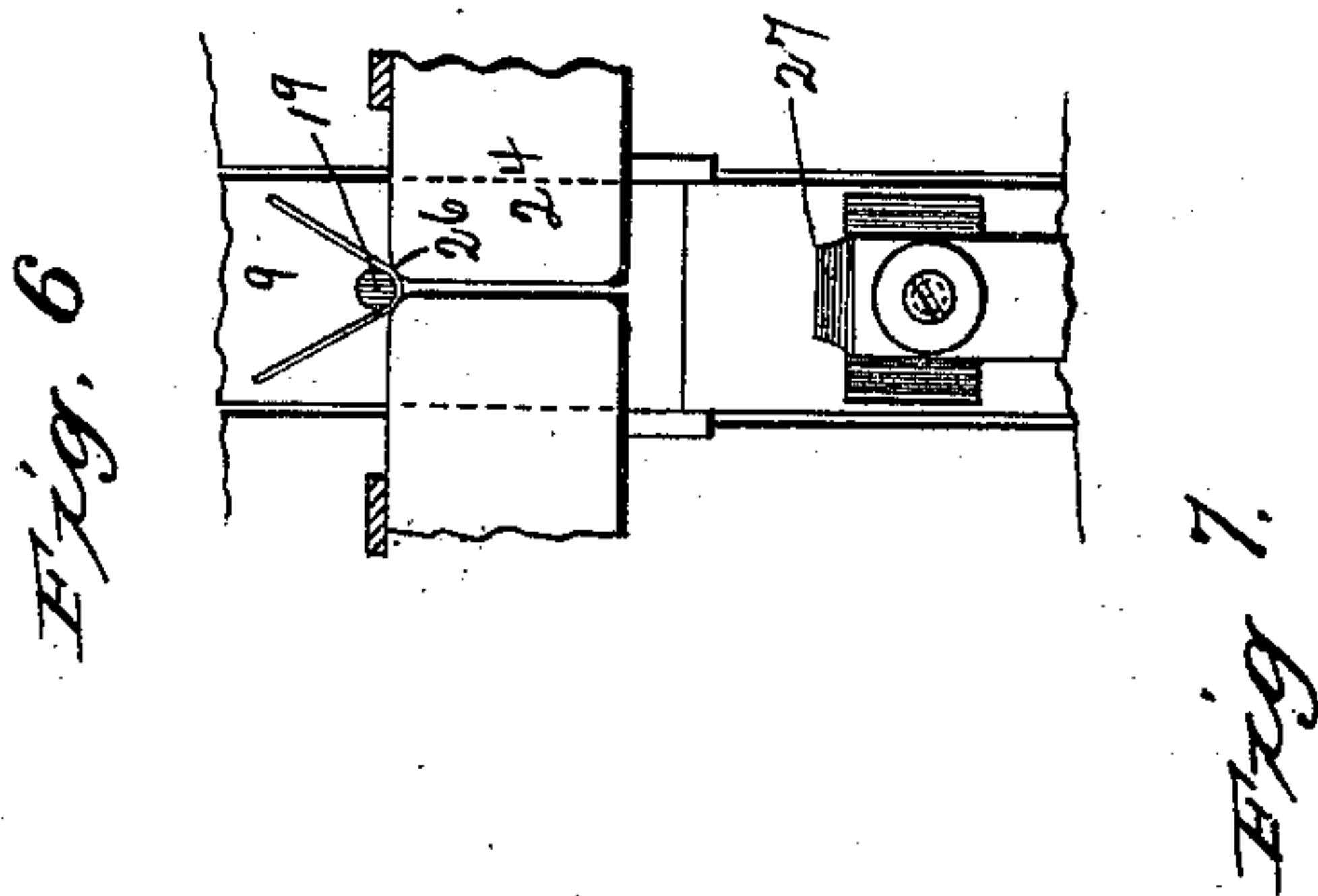
5 Sheets—Sheet 4.

R. J. SHIPLEY.

MACHINE FOR MAKING PAPER FASTENERS.

No. 418,536.

Patented Dec. 31, 1889



Witnesses
E. D. Smith
A. H. Morris.

Inventor:
Ralph J. Shipley
by James L. Norris
his Atty.

(No Model.)

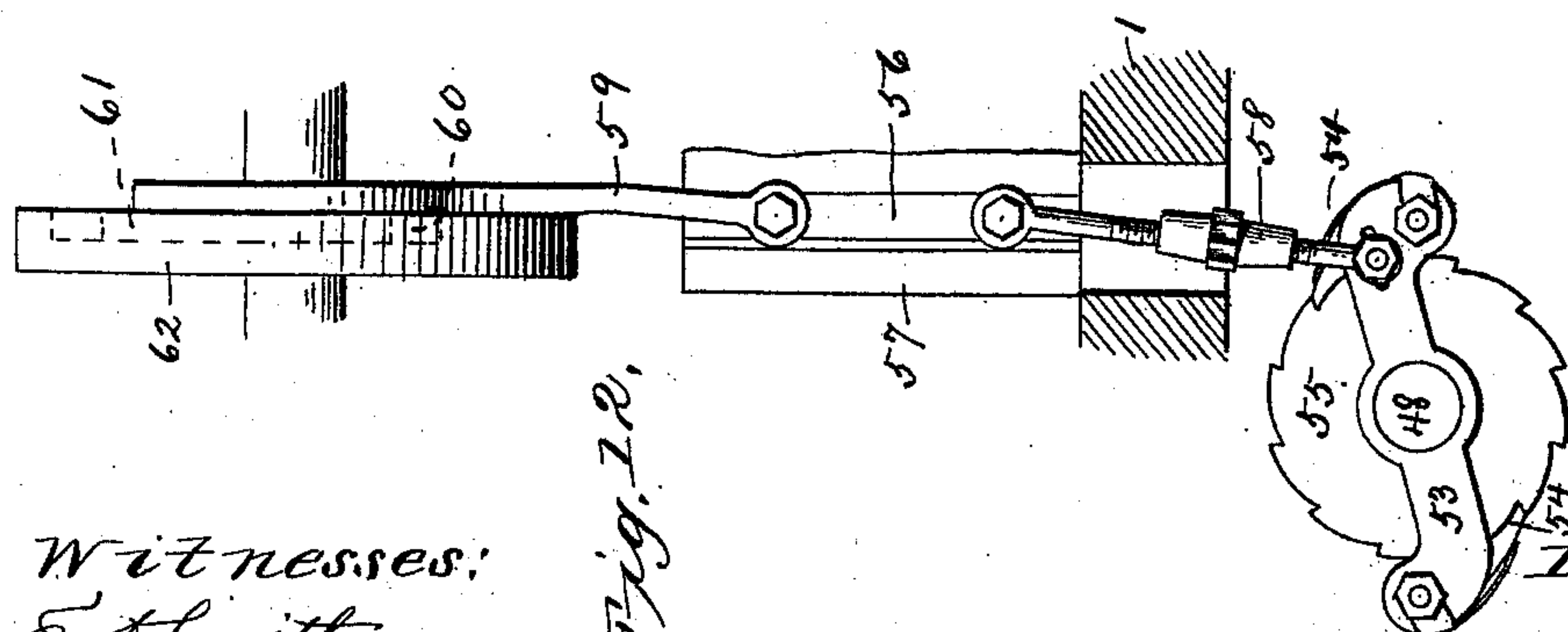
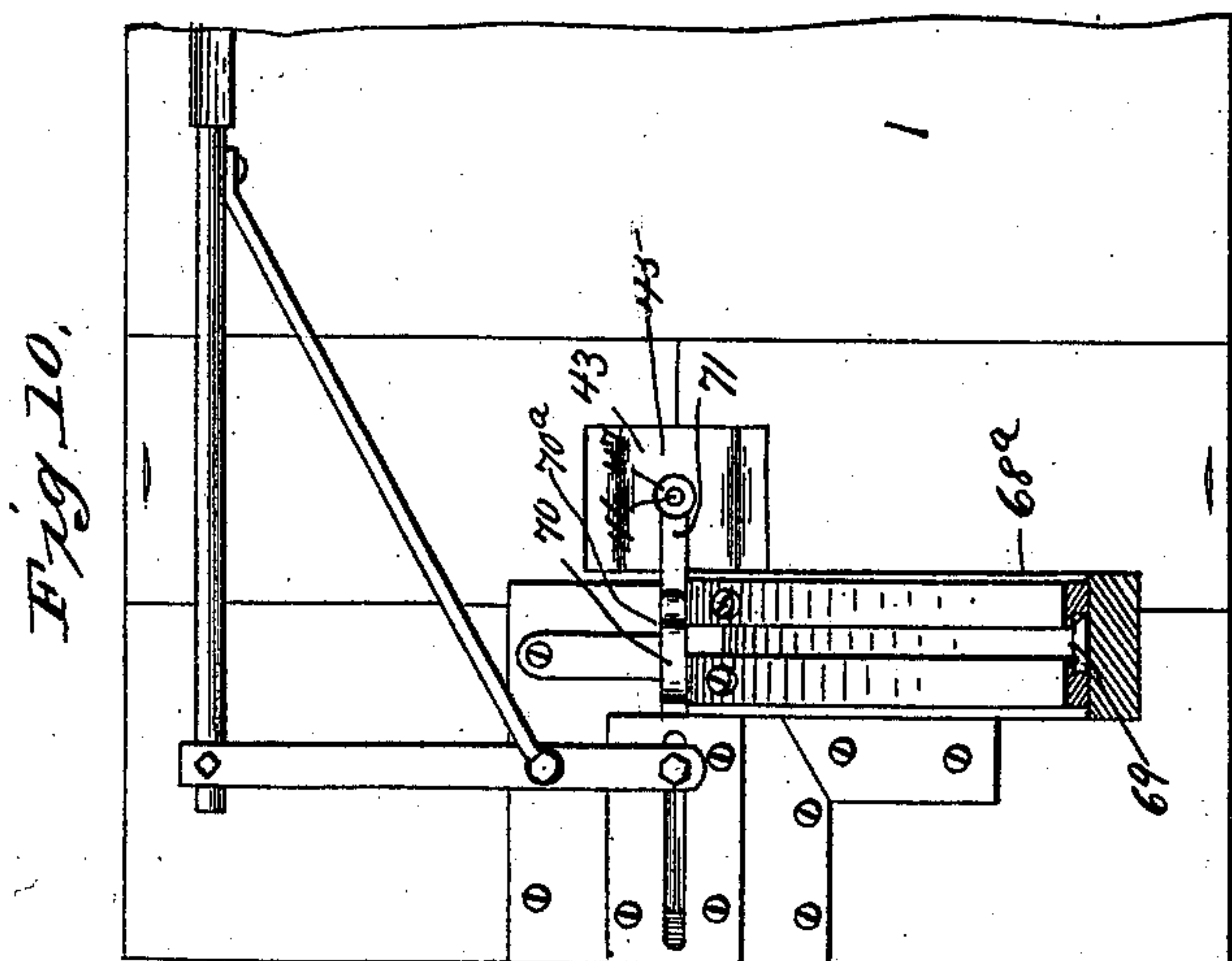
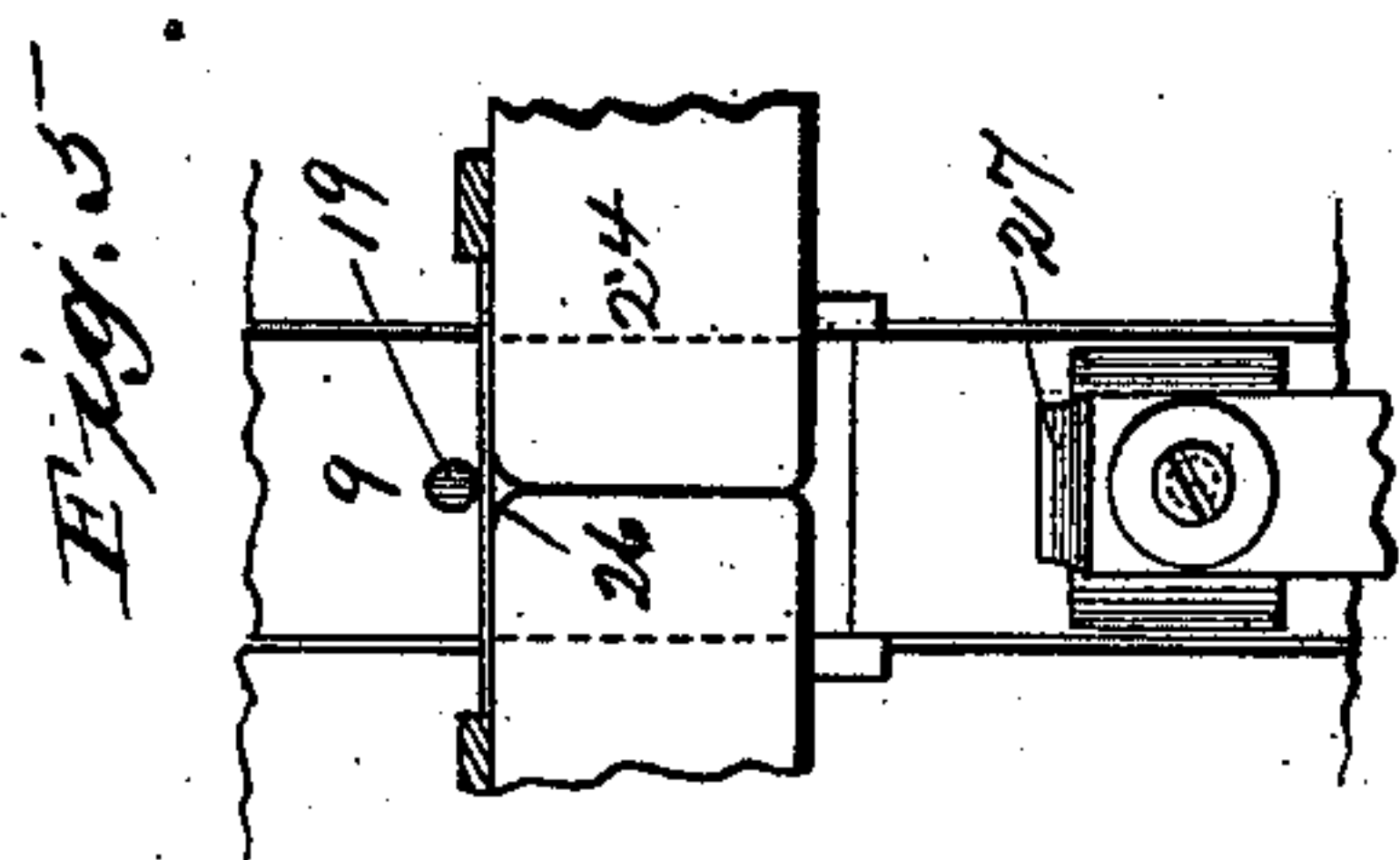
R. J. SHIPLEY.

5 Sheets—Sheet 5.

MACHINE FOR MAKING PAPER FASTENERS.

No. 418,536.

Patented Dec. 31, 1889.



Witnesses:
E. D. Smith
A. H. Norris.

Inventor
Ralph J. Shipley
by James L. Norris
his Atty.

UNITED STATES PATENT OFFICE.

RALPH J. SHIPLEY, OF WATERBURY, CONNECTICUT, ASSIGNOR TO GEORGE W. MCGILL, OF RIVERDALE, NEW YORK.

MACHINE FOR MAKING PAPER-FASTENERS.

SPECIFICATION forming part of Letters Patent No. 418,536, dated December 31, 1889.

Application filed October 22, 1889. Serial No. 327,815. (No model.)

To all whom it may concern:

Be it known that I, RALPH J. SHIPLEY, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented new and useful Improvements in Machines for Making Metallic Paper-Fasteners, of which the following is a specification.

My present invention relates to the manufacture of that class of McGill's paper-fasteners ordinarily termed "round-head," and consisting of a T fastener formed from a single blank or strip of metal, and provided with a round metallic cap upset upon and firmly inclosing the head of said fastener.

It is the purpose of my invention to provide automatic mechanism whereby the manufacture of the fasteners and the attachment of the heads or caps thereto may be rapidly and automatically carried on, the metal blanks being fed to the forming-dies, the fastener bent to the required shape and then fed to and inserted in an intermittently-revolving die, the caps being fed to said die and placed upon or inclosing the head of the fastener, and the cap being upset upon the latter by pressure, whereby the metal is turned over inward upon the head of the fastener and firmly and permanently secured thereto.

The invention consists to these ends in the several novel parts and combination of parts hereinafter set forth, and then specifically pointed out and defined in the claims following this specification.

To enable others skilled in the art to practice said invention, I will describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of the entire machine. Fig. 2 is a central vertical section of Fig. 1, taken in or nearly in the line of the axis of the die-shaft. Fig. 3 is a vertical section taken through the center of the hopper containing the blanks, or in the line $x x$, Fig. 4. Fig. 4 is a plan view of the parts shown in Fig. 3. Fig. 5 is a detail view showing the initial operation of the forming-dies. Fig. 6 is a detail view showing the further action of said dies, initiating the bend of the blank. Fig. 7 is a similar view showing the action of the

bending-dies. Fig. 8 is a similar view showing the final action of the bending-dies. Fig. 9 is a similar view showing the operation of the hammer-die and the completion of the fastener. Fig. 10 is a plan view of the lower part of the chute feeding the caps, with the devices feeding them to the die containing the fasteners. Fig. 11 is a plan view of the hopper containing the caps, the chute, and the clearing devices. Fig. 12 is a detail elevation of the devices giving intermittent movement to the revolving die. Fig. 13 is a section of one of the upsetting-dies, showing the fastener and cap in place for the action of the male die.

Following for convenience of description the order of the successive steps in the process of manufacture, as nearly as it is possible to do so, the reference-numeral 1 designates the bed-plate of the machine, which may be supported on legs 2. Projecting from one side of this bed-plate is a lateral extension 3, upon which is erected a hopper 4, having an opening 5 of a size adapted to receive and permit the descent of a stack or pile of blanks consisting of narrow strips of thin metal of suitable length, the hopper being supplied by a cob 6 mounted thereon in the usual manner.

The hopper 4 is sustained upon a shelf or supporting-plate 7, Fig. 3, rigidly mounted on the extension 3, and beneath this shelf are arranged slideways 8, within which is mounted a carriage 9, having an extended flat surface. This carriage is provided with a thin feed blade or plate 10, attached by one end to a block 12, to bring it into the plane of the bottom of the hopper 4, between which and the surface of the shelf 7 the plate reciprocates in a space just sufficient to permit the passage of a single blank lying flat upon its face. The carriage is reciprocated by a pitman 13, connected with a wrist-pin on a wheel 14, carried by a shaft 15, mounted in bearings 16, Fig. 4, on the lateral extension 3. At each forward movement of the feed-blade the carriage is moved with it beneath the hopper, and the blade pushing the lowermost blank out of the hopper drives it off the shelf 7 and drops it down upon the surface of the carriage 9. Depending from this carriage is a

socket 17, in which lies a carrier 18, having a metal pin 19 projecting from its upper end and passing through an opening in the carriage 9. The carrier 18, while reciprocating with the carriage 9, has also a vertical reciprocation of its own, whereby it is raised and causes the pin 19 to project above the surface of the carriage a distance about equal to the width of the blank. This pin is raised and lowered by a lever 20, fulcrumed upon a drop-bearing 21 beneath the carriage and having a friction-roll at its end running on a cam 22 on the shaft 15. The end of this lever is provided with a long slot 23, engaging a stud projecting from the carrier 18. The pin 19 rises as the movement of the carriage 9 carries it past the rear of the hopper, whereby the blank falls on the carriage between the hopper and the pin. As the carriage 9 recedes, the blank is carried with it until its edge is brought against the vertical faces of two separable dies 24, which are pressed together by powerful springs 25, Fig. 4. The pin 19 reciprocates in the line of the meeting faces of these dies, and their edges or angles are beveled off or rounded at 26, giving an entrance for the pin between said dies. These dies lie directly underneath the hopper 4 and move in ways supported by the shelf 7. As the blank is brought against them, the pin 19 impinges upon the middle or near portion of the blank, turning the latter upon its edge, and bringing one flat face against the vertical edges of the dies 24, while the other face lies against the pin 19.

The further movement of the carriage 9 draws the pin into the recess formed by the rounded angles 26 of the dies, partly bending the blank, as shown in Fig. 6. It then passes onward, drawing the blank wholly between the dies, as shown in Fig. 7, and finally carrying the pin and the bent portion of the blank through and out of the dies, whereon the latter close, as shown in Fig. 8, forcing the prongs together. The pin 19 is now withdrawn, and a hammer-die 27, reciprocated by the pitman 13, is brought against the circular loop formed by the pin, as shown in Fig. 9, flattening said loop and completing the fastener.

The carriage which has gone forward again recedes, carrying another blank through the dies and thereby forcing the completed fastener out and bringing it into the path of a slide-bar 28, having a recess 29 in one angle, which receives one-half the head of the fastener, while the prongs lie flat against its end. This slide pushes the fastener to a chute 30, in which it descends to and rests upon a slide-plate 31, arranged in a way 32 in a bracket-block 33, mounted on the main frame or bed-plate and lying underneath the table or extension 3. This slide is thrown forward by a spring 34 and retracted by a lever 35, fulcrumed on a lug 36 and operated by a cam 37, carried by a shaft 38, journaled partly upon standards rising from the main frame and

partly on a bracket 39, projecting from said standard.

With the slide-plate 31 is coupled a second and longer slide-plate 40, lying below and separated from the slide-plate 31 by means of a rigid plate 41. Both these slides are coupled to a head 42, with which a guide-bar 43 connects, sliding in the bracket-block 33 and connected by a pin to the slotted end of the lever 35.

As the fastener sinks to the bottom of the chute 30, it lies on the slide-plate 31 until, as the latter recedes, it is dropped upon the intermediate plate 41. The forward movement of the slide then pushes it, prongs first, until it passes off the plate 41 and falls upon the slide-plate 40. The retrograde movement of the latter brings the head of the fastener against the end of the stationary plate 41, whereby it is swept off the long slide-plate 40 and drops upon the floor of the recess 32. At the next forward movement of the slide 40 the fastener is driven, prongs foremost, through the passage-way in the bracket-block 33, in which said slide moves, and passes out at the end of the same, its prongs or feet being received in suitable cavities in a rotary die-block 43, so arranged that its periphery, in which said cavities are formed, is brought close to the end of the bracket-block 33 and opposite the opening from which the blank is fed.

The rotary die-block 43 is journaled beneath the bed-plate 1. It consists of a large block of metal carrying a series of dies 45, all arranged radially with respect to the shaft of the die-block and at the same distance from its axis. Each of the dies 45 contains an aperture 46, adapted to receive the feet or prongs of the fastener as it is driven by the slide-plate 41, and is provided with a circular upsetting-die 47 (shown in cross-section in Fig. 13) and adapted to receive the cross-head of the fastener. The die-block is mounted on a shaft 48, Fig. 2, supported in bearings 49, and with which the block is rigid. This shaft projects from one side of the die-block, and on the other side or face is arranged a threaded adjustable stud 50, tapped through a drop-bracket 51, and having a point which enters a seat in the face of the block. A jam-nut 52 holds the stud-bearing at any point to which it may be adjusted.

The shaft 48, carrying the die-block, is rotated intermittently by means of a double-armed lever 53, loosely mounted on the end of the shaft 48 and carrying spring-pressed pawls 54, which engage a ratchet 55, rigid on said shaft. The lever 53 is reciprocated by a slide 56, moving in ways 57 and connected to the lever by a turn-buckle 58. The slide is actuated by a cam-arm 59, having upon its end a friction-roll 60, lying in a cam-race 61, formed in a wheel 62. After each feed movement the die-block is held by a detent-bar 63, the point of which enters openings 64 in the face of the block. This bar is operated in

one direction by a spring 65 and in the other by a cam-lever 66, having a roll 67, running on a cam 68 on the same shaft with the wheel 62, the spring effecting the locking engagement and the lever releasing the bar.

Arranged above the bed-plate 1 is a chute 68^a, its delivery end being placed a little to one side of the die-block 43, Fig. 10. This chute contains a passage 69, of such size and shape as to permit the passage of a single line of the caps, which consist of cup-shaped bodies of thin metal, which pass down within the channel 69, resting on their open ends, the overhanging edges of the chute confining them in the channel 69 and preventing them from escaping. The series of caps contained in the chute press the lower cap out of the channel, whence it passes under a light leaf-spring 70 and against a shoulder or plate 70^a, by which it is stopped. A feed-bar 71 then advances and pushes the cap from beneath the spring into the upsetting-die 47, where it rests upon its edges, surrounding the head of the fastener. A male die or punch 72 then descends upon the cap, whose edges are by the peculiar formation of the upsetting-die caused to curl inward, passing beneath the ends of the cross-head of the fastener and being securely attached thereto. The male die is carried by a sliding head 73, moving in a standard 74 and actuated by a toggle-lever 75, which in turn is operated by a pitman 76, connected to a crank on the shaft 38.

The caps are placed in any suitable number in a hopper-barrel 77, mounted on an inclined axis 78, to which revolution is imparted by a belt 79, running over a pulley 80 on the inclined shaft of the hopper, and driven by a pulley 81 on the shaft 38. The hopper or drum 77 consists of a cylindrical receptacle revolving upon a flat inclined stationary shelf 82, a ring 83 being mounted on said shelf between the latter and the drum. In the ring 83 is formed an opening 84, of a size adapted to permit the escape of one cap at a time, provided said cap issues through said opening upon its open end. If turned upon its side or upon its closed end, it will stick in the opening, the latter being arranged opposite the entrance to the chute 68. In order to clear the opening 84, in case one of the caps becomes choked therein, a clearing-slide 85 is mounted on the edge of the chute 68, Fig. 11, and reciprocated by a spring 86, and a bell-crank lever 87, pivoted on a lug 88 on the chute. This bell-crank has a curved arm, which is drawn by the tension of the spring 86 against the wall of the drum 77, on which is mounted a leaf-spring 89, which has a tension greater than that of the spring 86. By the revolution of the drum the leaf-spring is drawn between the drum and the curved arm of the bell-crank, which is thrown by said spring away from the barrel, projecting the slide inward and clearing the opening. Upon the interior of the drum are mounted brushes

90, which agitate the caps and assist in presenting them to the escape-opening 84.

The stroke of the male die 72 is adjusted by means of a stem 91, passed through the top of the standard 74 and connected to the head 92, which is pivoted to one arm of the toggle-lever 75. Jam-nuts 93 and an adjusting-nut 94, turned on the stem 91, provide means for the adjustment.

What I claim is—

1. In a machine for forming and capping paper-fasteners, the combination, with means for feeding the blank and forming the fastener, of an intermittently-rotating die-block having cavities in which the feet or prongs of the fasteners are inserted, and provided with upsetting-dies in which the heads of the fasteners lie, a chute feeding the caps to said upsetting-dies, and a male die forcing said caps down in the upsetting-dies and drawing their edges under the heads of the fasteners, substantially as described.

2. In a machine for forming and capping paper-fasteners, the combination, with a hopper containing the blanks, of a carriage reciprocating beneath said hopper and carrying a feed-blade or slide pushing a blank out of the hopper upon the carriage, a pin rising and falling through the carriage, spring-pressed jaws between which the pin passes carrying the blank, a hammer-die forming the head, and a feed-slide pushing the formed fastener into a vertical chute, substantially as described.

3. In a machine for forming and capping paper-fasteners, the combination, with mechanism for bending the blank and forming the head of the fastener, of a feed-slide delivering the fastener to a vertical chute, a short slide moving beneath said chute and upon a stationary strip, upon which the fastener is dropped by the retrograde movement of the slide, a long slide moving beneath the stationary strip, upon which the fastener is dropped by the forward movement of the short slide, and a die-block having apertures which receive the prongs or feet of the fasteners which are fed thereto by the long slide, substantially as described.

4. In a machine for forming and capping paper-fasteners, the combination, with a pair of separable spring-pressed jaws, of a pin carrying the blank between said jaws, a hammer-die flattening the head, a feed-slide delivering the fastener to a vertical chute, a slide reciprocating beneath said chute and dropping the fastener upon a stationary strip below said slide, a long slide moving in a recess below the stationary strip and receiving the fastener which is pushed off said long slide as the latter recedes by the end of the stationary strip, and a rotating die-block having apertures receiving the feet of the fasteners as they are pushed out of the recess in which the long slide reciprocates, substantially as described.

5. In a machine for forming and capping paper-fasteners, the combination, with a rotating die-block having openings which receive the feet or prongs of the paper-fasteners and provided with upsetting-dies receiving the heads, of a chute feeding the caps, a feed-slide placing the caps one by one in the upsetting-dies, and a die upsetting the caps upon the heads of the paper-fasteners, substantially as described.

6. In a machine for forming and capping paper-fasteners, the combination, with the bending and heading mechanism, and with means for feeding the fasteners, of a rotating die-block having openings receiving the feet or prongs and upsetting-dies receiving the heads, a chute feeding the caps, a feed-slide placing the caps in the upsetting-dies, a male die, a revolving drum containing the caps and moving upon a ring having an escape-open-

ing opposite the head of the chute, and a reciprocating clearer entering said opening at intervals, substantially as described.

7. In a machine for capping paper-fasteners, the combination, with a chute feeding the caps, of a rotating drum moving upon a ring having an escape-opening, a reciprocating spring-retracted clearing-slide entering said opening and receding therefrom, and a leaf-spring mounted on the drum and passing at each revolution between the drum and an arm of a bell-crank lever connected to said feed-slide, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

RALPH J. SHIPLEY.

Witnesses:

F. L. ADAMS,
H. H. WALKER.