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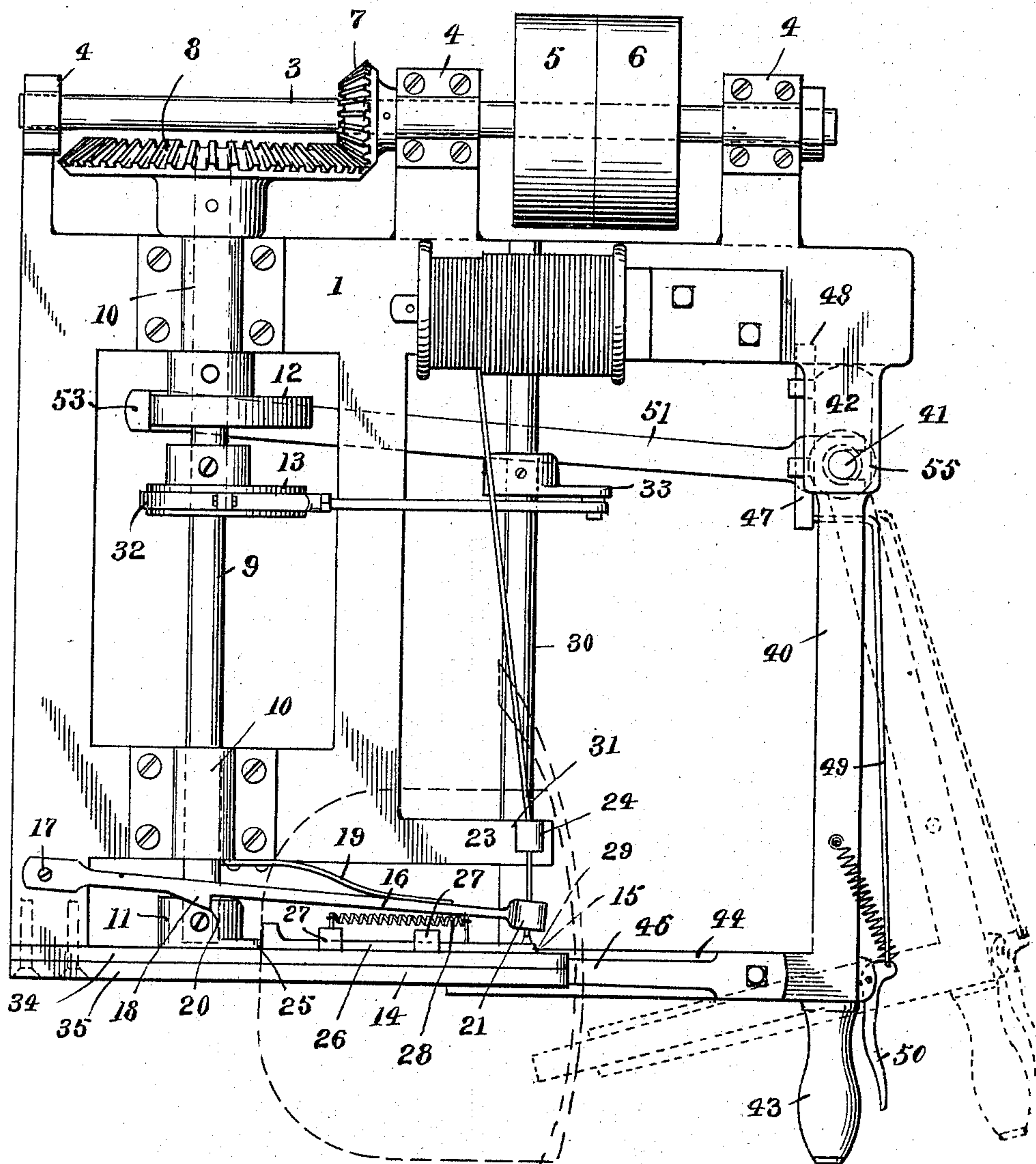
3 Sheets—Sheet 1.

W. H. JACKSON.
STAPLE FORMING AND DRIVING MACHINE.

No. 573,329.

Patented Dec. 15, 1896.

Fig. 1.



Witnesses

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Harriet Slason.

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(No Model.)

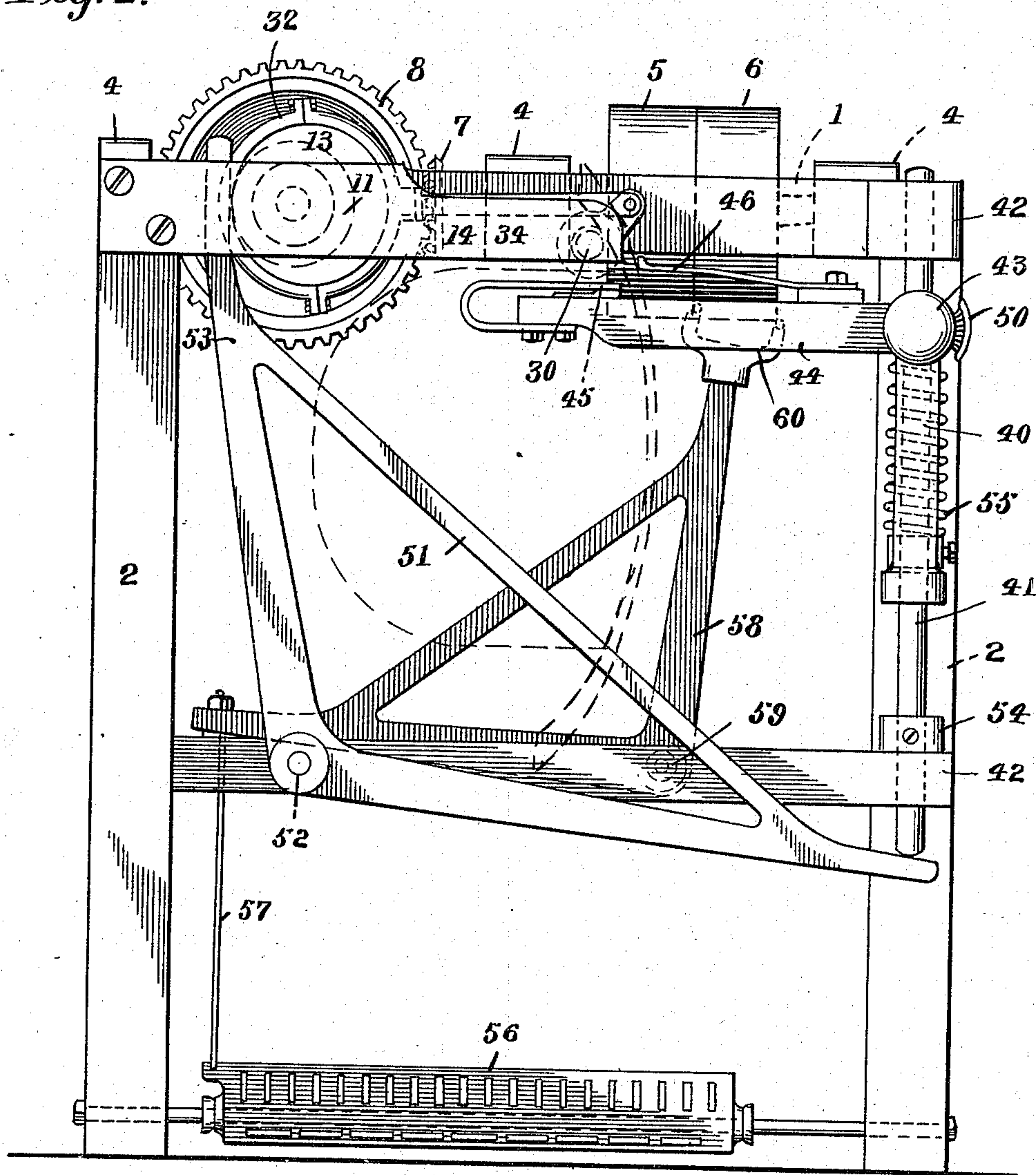
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Fig. 2.



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3 Sheets—Sheet 3.

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Fig. 3.

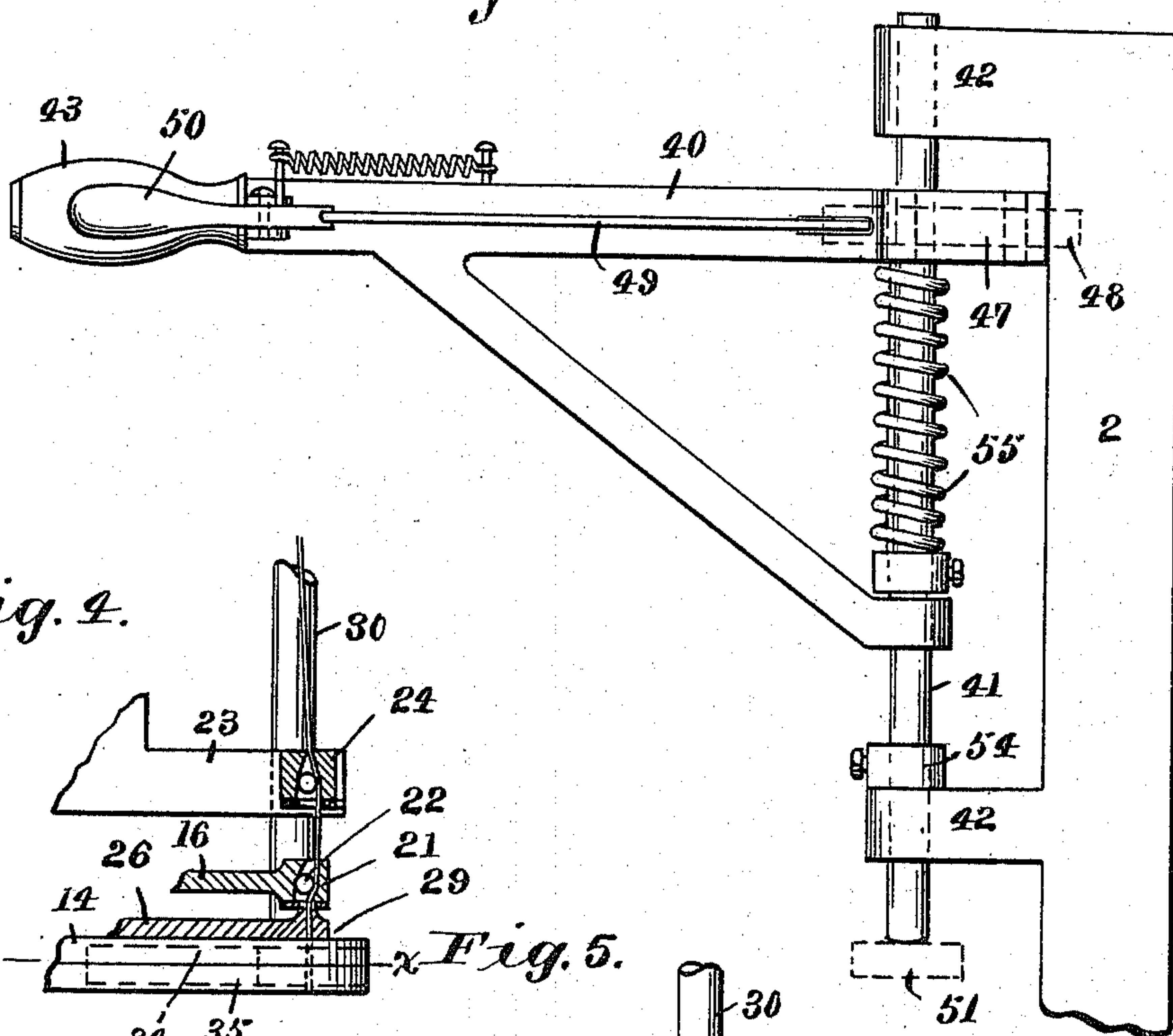


Fig. 4.

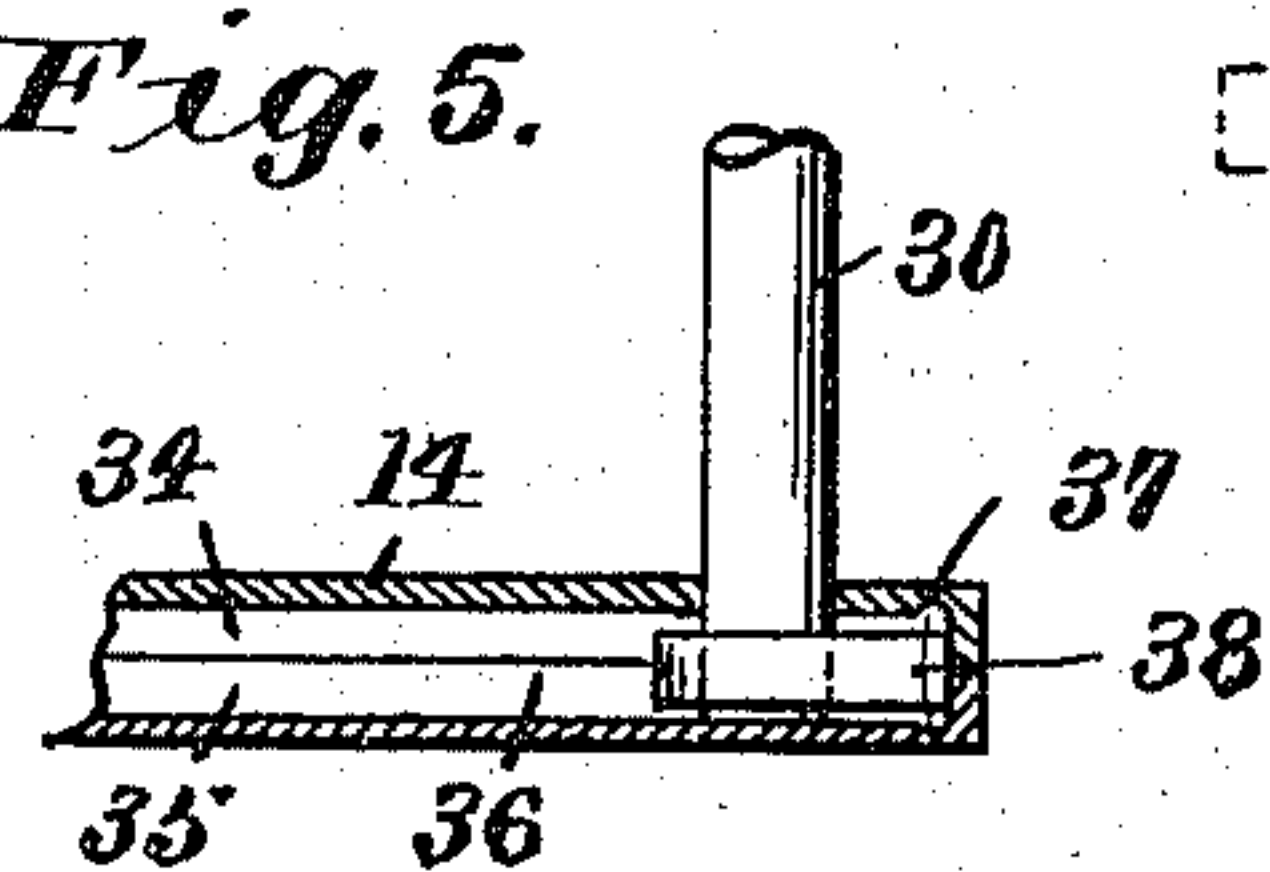
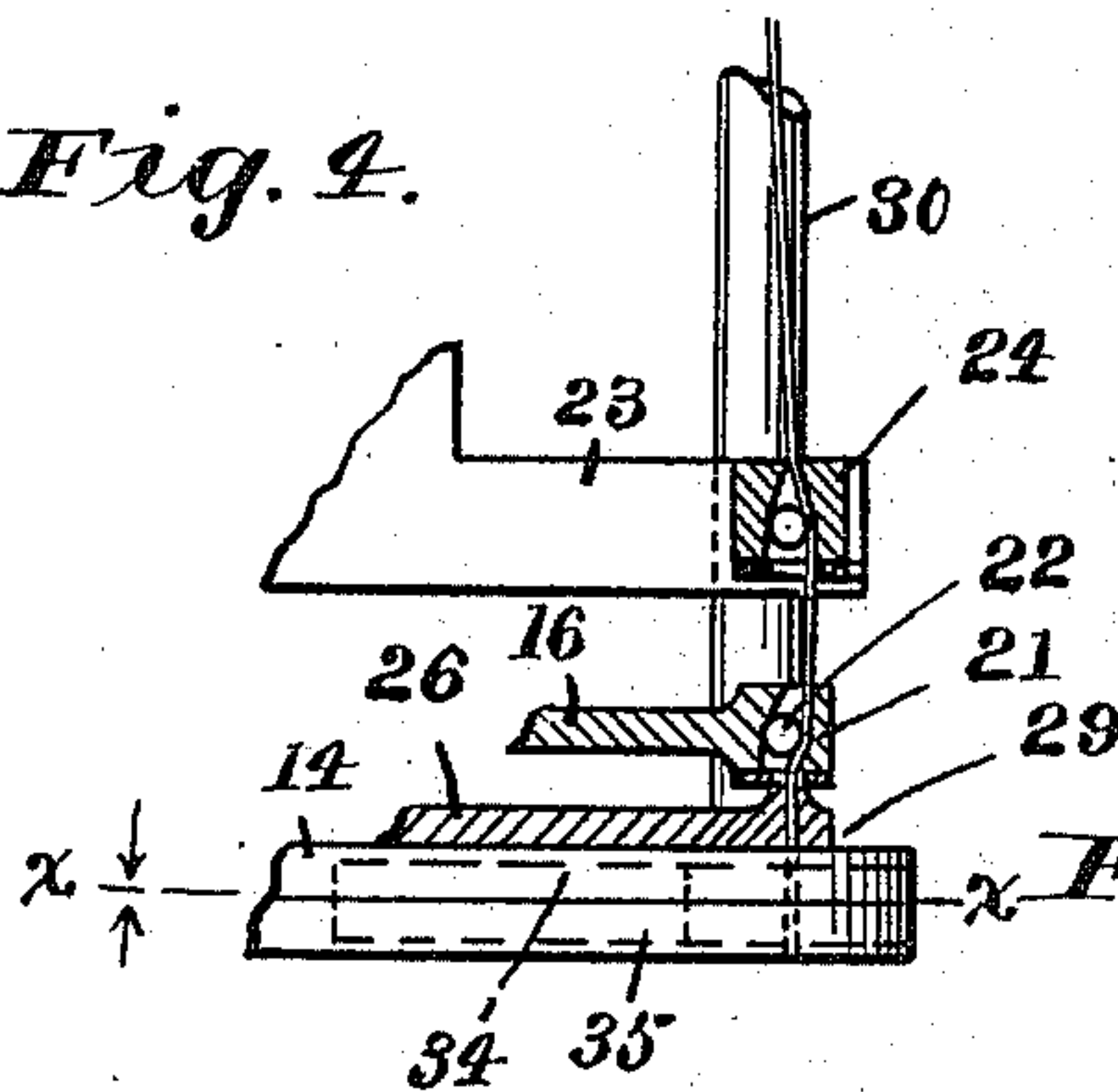


Fig. 6.

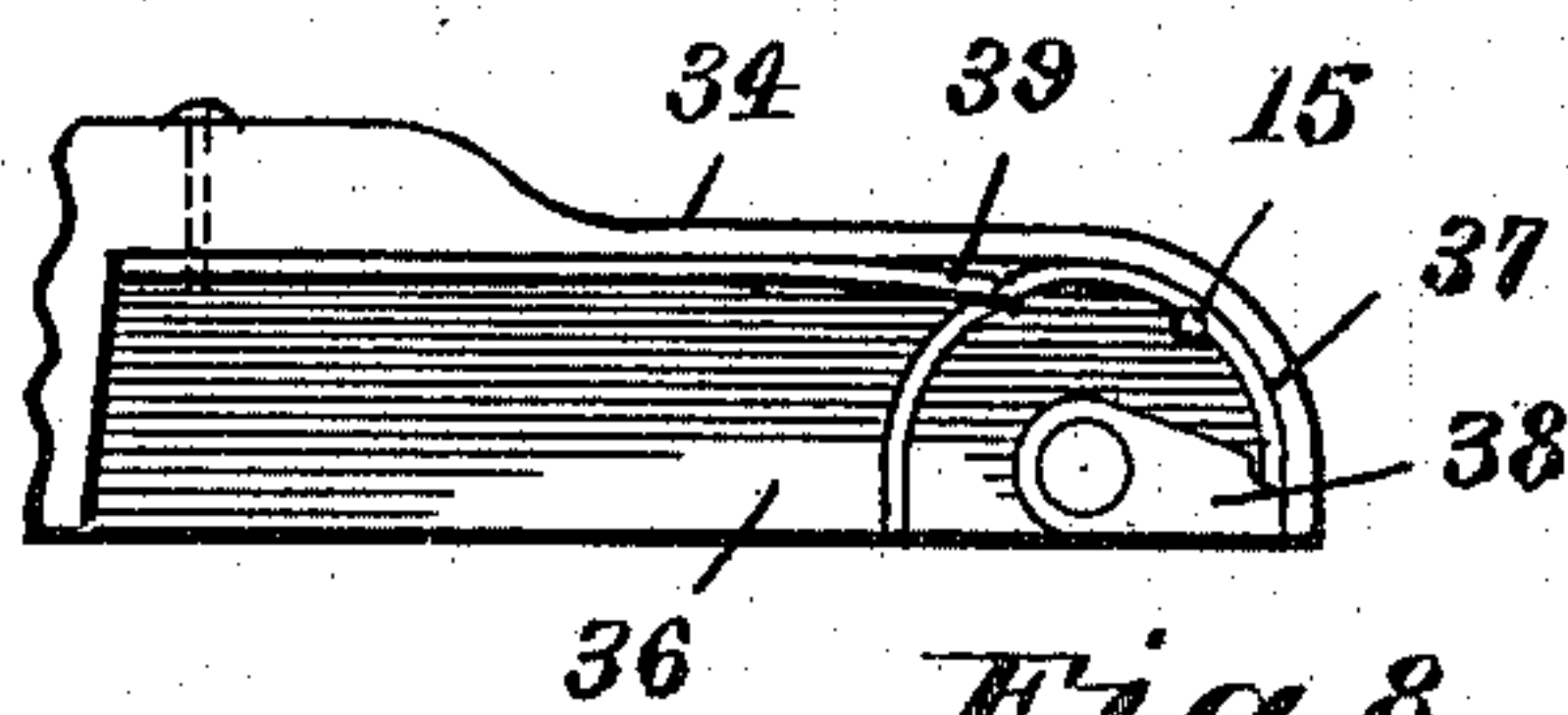


Fig. 7.

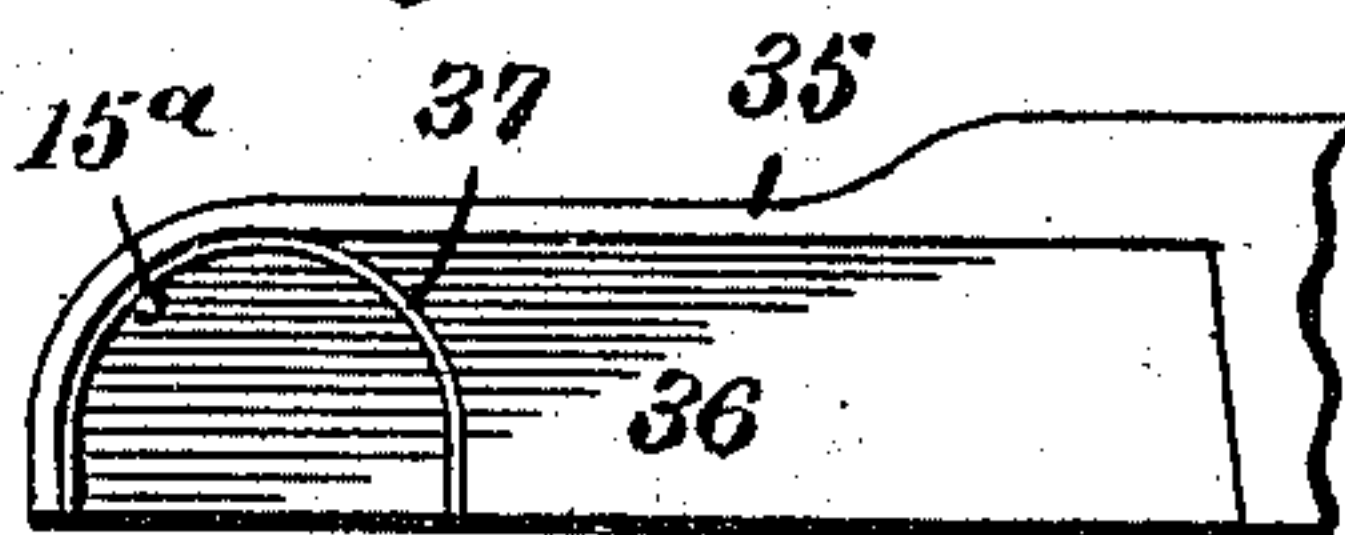
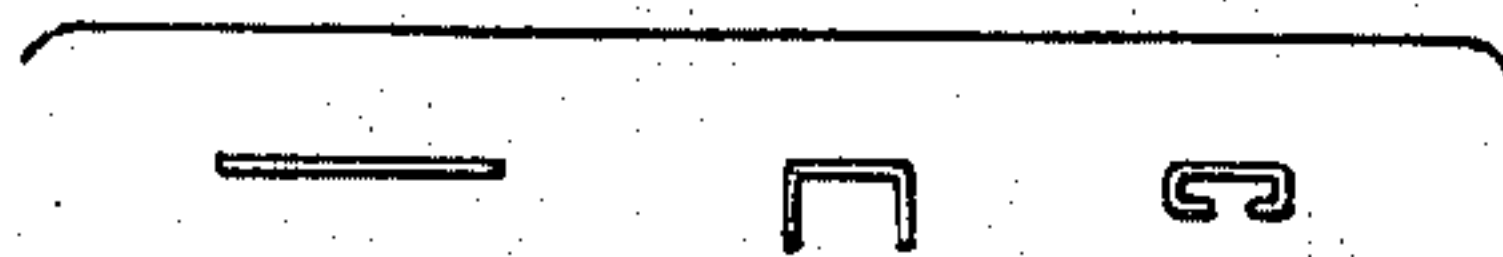


Fig. 8.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM H. JACKSON, OF FALL RIVER, MASSACHUSETTS, ASSIGNOR TO
JAMES MARSHALL, OF SAME PLACE.

STAPLE FORMING AND DRIVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 573,329, dated December 15, 1896.

Application filed February 21, 1896. Serial No. 580,287. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. JACKSON, a citizen of the United States, and a resident of Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Staple Forming and Driving Machines, of which the following is a specification.

This invention relates to new and useful improvements in machines for converting wire into staples and then driving the same into any suitable material.

It is the object of my invention to improve upon machines of the above class and to construct a machine which is particularly adapted for attaching sweat leathers and bands to hats by means of staples, as above described. I also simplify and construct the mechanism in such a manner as to warrant more speedy operations, and, further, to permit of said machine being operated by power instead of by hand.

I am aware that it is not broadly new to construct a machine for the purpose of attaching sweat leathers and bands to hats, and I am further aware that said machines are complicated, and thus give more or less trouble in their operations, and in consequence require numerous repairs which must be made by a skilled mechanic. Besides greatly simplifying this class of machines I improve the detail mechanism in such a manner as to accomplish more perfect operations. I also improve upon the staple forming and driving mechanism in such a manner that it will operate upon a curled-brim hat as desirably as upon a straight brim. The importance of this feature will be apparent when it is considered that there are a great many more curled-brim hats manufactured than straight ones.

My machine is constructed in such a manner as to support a hat while being operated upon and to permit the same being shifted between said operations. It automatically takes the wire from the reel, cuts off blanks the desired length, converts said blanks into staples, forces the same through the band and hat-body, and finally clenches the points firmly into the material. The machine is operated by one attendant, who stands at the front of the machine and manipulates the

hand and foot levers in a manner to permit of the hat being placed upon its rest and to shift the belt from one pulley of the driving-shaft to the other.

With the above objects in view I have devised the novel and simple construction illustrated in the accompanying drawings, which form a part of this specification, and upon which similar reference characters denote like or corresponding parts upon the several figures, and of which—

Figure 1 is a plan view of my machine complete, showing in dotted lines a hat thereon. Fig. 2 is a front elevation of the machine, the position of the parts agreeing with Fig. 1. Fig. 3 is a detail side elevation of the swinging bracket carrying the hat-support. Fig. 4 is a sectional plan view of the wire feeding and cutting mechanisms. Fig. 5 is a detailed sectional plan view of the mechanism for forming and driving the staple. Figs. 6 and 7 show vertical sectional views on line *xx* of Fig. 4, looking in opposite directions. Fig. 8 shows different stages of the operations upon the wire.

Referring to the numerals marked upon the drawings, 1 indicates the top framework, and 2 legs supporting the same. 3 indicates the driving-shaft, mounted in bearings 4 of the frame and provided with a tight and loose belt-pulley 5 and 6, respectively. Said shaft is further provided with a small beveled pinion 7, which meshes with and drives a large bevel-pinion 8, secured to shaft 9, placed at a right angle to the main driving-shaft and journaled in suitable bearings 10 of the frame 1. Upon this shaft 9 are secured cams 11 and 12 and eccentric 13, each of which operate certain sets of mechanism, the first of which I will next describe as follows, and what I term as "feeding" mechanism:

Wire-feeding mechanism.—The cam 11 on the near end of the shaft 9 is a double-purpose cam, and serves to operate both the feeding and cutting mechanism. I will accordingly first describe its connection with an operation of the feeding mechanism, and then describe the manner of severing the blanks from which the staples are formed. To the front of the frame 1 I secure a bracket 14, (see Figs. 1 and 2 and details,) containing the sta-

ple forming and driving mechanism, as will be later more fully described, but which in part consists of a hole 15, through which the wire is fed, and against which it is cut off the proper length. Adjacent to the inner face of said cam 11 is a feed-lever 16, pivoted to the frame at 17 and bearing a lug 18, which is firmly retained against the side of the cam 11 by means of the spring 19. Within said side of the cam 11 is formed an inclined recess 20, sufficiently large to allow the lug of the feed-lever to drop therein with each rotation of said cam, thereby throwing forward the free end of the feed-lever. By reason of the inclined surface of said recess 20 the lug 18 immediately rides off of said recess with the movement of the cam, thereby swinging the outer end of the feed-lever back to its normal position. As will be observed, (see Fig. 4,) the lever 16 is provided with a feed-clutch 21, consisting of an enlargement having a conical recess therein, terminating in a small hole through which the wire passes. Said recess is further provided with a friction-ball 22, the diameter of which is smaller than the recess, thus allowing the wire to pass between said ball and the wall of said recess, whereby the wire is firmly clamped within said clutch and thus fed forward with the movement of the lever. To the extension 23 of the frame is secured a similar clutch 24, which serves as a retaining-clutch instead of a feed-clutch; it being obvious that its ball will allow the wire to be freely drawn therethrough by the operation of the feed-clutch on the lever 16, but will readily check any backward movement of the wire caused by the return of the feed-lever.

Wire-cutting mechanism.—Cam 11, above mentioned, is further provided with a peripheral enlargement 25, which is in line with and operates the cutting-slide 26, movably fitted in guides 27, secured to the bracket 14 before mentioned. Said slide is normally held against the periphery of said cam by means of a spring 28, one end of which is secured thereto, the opposite end being secured to the bracket 14 aforesaid. 29 indicates the cutting edge of this slide, which serves to sever the wire by operating upon it against the wall of the hole 15 in the bracket 14, thus severing a blank at regular intervals.

Staple forming and driving mechanism.—Parallel with the shaft 9 is a rock-shaft 30, journaled in bearings 31 of the frame and in the bracket 14, secured thereto. Said shaft is afforded a rocking movement by reason of its connection with the previously mentioned cam-shaft 9, which connection consists of an eccentric 13, secured on said driven shaft and bearing a connecting-rod having straps 32 at one end encircling said eccentric, the opposite end of said rod being connected to an arm 33 on said rock-shaft. Thus it will be obvious that with each rotation of the driven shaft 9 the shaft 30 will be given a rocking motion, which movements, through the con-

nection of said shaft, serve to form the staple and drive the same into the material, as will be next described.

The bracket 14, before mentioned, is made in two parts, as shown in Figs. 6 and 7, and which I indicate by 34 and 35. The inner end of this bracket is provided with a recess 36 upon its under side, which recess in turn has a semicircular groove 37 in each side thereof. The end of the rock-shaft 30, before mentioned, extends into said recess and bears therein an operating-finger 38, as clearly appears in Figs. 5 and 6 of the drawings, and which forms and drives the staples. The wire from which the staples are made is fed into the recess the desired length through the small hole (indicated by 15) and against the shoulder 15^a, (see Fig. 4,) after which it is cut off by the cutting mechanism. The rock-shaft 30 is next operated in a manner to move the finger backward from the position shown in Fig. 6, whereupon said finger will come into contact with the center of the wire blank, the end of which is then detained in the hole 15 and shoulder 15^a, thus folding the same into practically a U-shaped staple, the free ends thereof being drawn into the groove 38, thus retaining and guiding the same. After the staple has been formed as above it is carried upward in said grooves until it comes into contact with the spring-like strippers 39, which serve to detain the progress of and strip the staple while the finger passes by it, after which the movement of the finger is reversed and the under side of said finger engages the head of the staple and forces the same down while it is properly guided into the band and hat through the grooves before mentioned.

Means for supporting the hat.—As previously stated, I provide means for supporting the hat while being operated upon, which means consists in a swinging bracket 40, hinged to a vertical rod 41, movably fitted in ways 42 of the frame. Said bracket is further provided with a handle 43, by means of which the operator swings the same out and in for the purpose of removing from and putting a hat upon the supporting-arm proper, which I indicate by 44. This support is provided with a yieldable clenching-plate 45, which in practice lies against the under side of the hat and serves to deflect the course of the ends of the staples and thus turn the same back into the hat-body. Adjacent to the plate above mentioned I provide a guide 46, against which the edge of the hat rests during the operations and against which it is moved between the operations.

The bracket 40 above mentioned is provided with means for rigidly locking it in its closed position, which consists in a spring-actuated slide 47, secured in ways of the bracket, and designed to normally engage a notch 48 in one of the legs 2 of the machine. Said slide is connected by means of a wire 49 with the finger-lever 50, pivoted adjacent to the operating-handle 43. From the above it

will be apparent that in order to swing open the support, as shown in dotted lines, (see Fig. 1,) the attendant would first manipulate the finger-lever 50 in a manner to disengage the sliding catch, thus releasing the bracket and permitting it to be swung out by the operator.

In order to permit the hat to be turned upon its support and thus shift its position to receive successive staples, I provide means for alternately raising the rod 41, its bracket and hat-support, against the resistance of gravity, consisting substantially as follows: The lower end of the rod 41, before mentioned, projects through the lower way 42 and rests upon the horizontal arm of a bell-crank lever 51, pivoted to the frame at 52. The remaining arm 53 of said lever extends upward and rides upon the surface of cam 13, before mentioned. It will accordingly be obvious that by reason of the irregular surface of said cam the bell-crank lever above referred to will be swung upon its pivot, forcing the vertical rod 41, its bracket and support, upward from the position shown in Fig. 2 until said support and the hat carried thereby are moved up against the staple-driving mechanism for the purpose of receiving a staple, after which the advanced periphery of the cam allows the support to drop, during which time the operator shifts the position of the hat to receive the next staple. In order to provide a yielding connection between the bracket 40 and its rod, I secure a collar 54 to said rod, and support thereby a coiled spring 55, which in turn serves to support the bracket 40 in such a manner that when said rod is forced up the spring will act upon the bracket and yieldably raise the same until its support comes into contact with the bracket 14 of the staple-former.

The starting and stopping of the machine are accomplished by means of foot-power applied to the treadle 56, having a wire connection 57 with a bell-crank lever 58, pivoted at 59 to the frame. The upwardly-extended arm of said bell-crank lever is provided with a fork 60, which serves to straddle the belt (not shown) and shift the same from the tight to the loose pulley, or vice versa, by means of the operation of the treadle, thus starting or stopping the machine according to said treadle movement.

The operation of my machine is as follows: Presuming the machine to be in the position shown in Fig. 1, the attendant would by means of his right hand manipulate the handle 43 and its finger-lever 50 in a manner to throw open the bracket 40 and its support; then place a hat upon the clenching-plate, as shown in dotted lines, and against the guide 46; next swing the bracket back to its normal position, where it is locked. The belt-shifter is next operated and the machine started in motion. The first operation is that of the cam 13, which raises the bracket 40 and the hat contained thereon up against the bracket

14, after which the finger 38 operates to form the staple and drive the same into the hat. The instant the above is accomplished the cam 13 allows the bracket to drop sufficiently to permit the operator to move the hat and its band upon the support a short distance, when said cam will again raise the bracket to its elevated position, when the former operations of forming and driving the staple are repeated. The staples are in this manner repeatedly made and inserted and the bands and sweats attached to said hats by means of such repeated operation, the number upon each hat varying according to the class of work and size of hat. After the desired number of staples have been inserted as above the belt is shifted back upon the loose pulley, the bracket 40 thrown open, and the finished hat removed therefrom.

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

1. In a staple forming and driving machine, the combination of the bracket 14 having a recess therein, a rock-shaft journaled in said bracket, a radially-swinging finger secured to said shaft and operating in said recess in such a manner as to form a staple by its upward movement, and to force the staple in a hat and sweat-band in its downward movement.

2. In a staple forming and driving machine, the combination of the bracket 14 having a recess therein, a rock-shaft journaled in said bracket, a finger secured to said shaft and adapted to swing radially in said recess to form and drive a staple, semicircular grooves in the side walls of said recess serving to properly guide the staple in its attaching operation.

3. In a machine of the class described, the combination of a frame having a staple-forming recess, a rock-shaft having a finger swinging radially within said recess, means for feeding the wire across the back side of the finger, semicircular grooves in the sides of said recess and bearing-shoulders against which the wire is bent by the finger, a stripper projecting into the path of the movement of the finger to detain the staple, means for operating the rock-shaft and finger to force the staple into the material.

4. In a machine of the class described, the combination of a frame having a staple-forming recess, a rock-shaft having an arm extending into said recess, means for feeding the wire into the recess across the back side of the finger, mechanism for cutting the wire into suitable lengths after it has been fed, a stripper to shift the position of the staple, means to operate the same to drive and clench it into a hat.

5. In a machine of the class described, the combination with a staple forming and driving device, of an automatic vertically-movable hat-support, means for swinging said support to and from the staple-driving device, a yieldable connection between said support

and its operating mechanism, whereby said support is permitted to slightly yield with the pressure of the staple-driver, substantially as described.

5 6. In a machine of the class described, the combination with a staple forming and driving device, of a hat-support adapted to be radially swung into operative connection with said device, means for locking said support
10 in its closed position, automatic means for raising and lowering said support to shift the position of the hat, substantially as described.

7. The combination in a machine of the class described of the feed-lever bearing a
15 clutch, a retaining-clutch adjacent thereto, a staple forming and driving finger mounted on a rock-shaft and adapted to swing within a recess, semicircular grooves in the sides of said recess and bearing-shoulders against
20 which the wire is bent, a cutting-slide adjacent to one of said shoulders, a cam operatively mounted upon said shaft and constituting means for operating said slide.

8. The frame having a bracket 14, the rock-
25 shaft journaled therein, an operating-finger secured to said shaft and adapted to play into a recess of the bracket in combination with the driven shaft 9, connections between said shaft and the rock-shaft whereby the
30 latter and its finger is operated to form and drive a staple.

9. The bracket 14 having a recess therein, a rock-shaft journaled in said bracket and bearing a finger to operate in said recess in
35 combination with the mechanism for operating said rock-shaft, a driven shaft 9, a cam upon said shaft, connections with said cam for operating the cutting-slide, a lever piv-

oted to the frame and bearing a clutch to automatically grasp and feed the wire, means 40 for engaging and manipulating said lever, substantially as described.

10. A staple forming and driving machine comprising the shaft 9, means for driving the same, a shaft 30 adjacent to said driven shaft, 45 connections between said shafts, whereby the latter is rocked by the former, bracket 14 having a semicircular recess, a finger secured to the rock-shaft aforesaid and designed to operate in said recess, means for feeding the
50 wire the proper distance, mechanism for cutting the wire into proper lengths, substantially as described.

11. A staple forming and driving machine comprising feeding mechanism as shown, a
55 rock-shaft bearing an operating-finger for the purpose of forming a staple, an automatic vertically-movable clenching-plate, means whereby said plate is swung with relation to said staple-operating mechanism. 60

12. A staple forming and driving machine comprising the rock-shaft bearing the operating-finger, a suitable recess in which said
65 finger operates, a pivoted hat-support adapted to be swung to and from said staple mechanism, automatic means for remittently moving said support in a vertical manner, substantially as described.

Signed at Fall River, in the county of Bristol and State of Massachusetts, this 18th day 70 of February, A. D. 1896.

WILLIAM H. JACKSON.

Witnesses:

A. E. CRANKSHAW,
L. W. BURRELL.