

No. 698,695.

Patented Apr. 29, 1902.

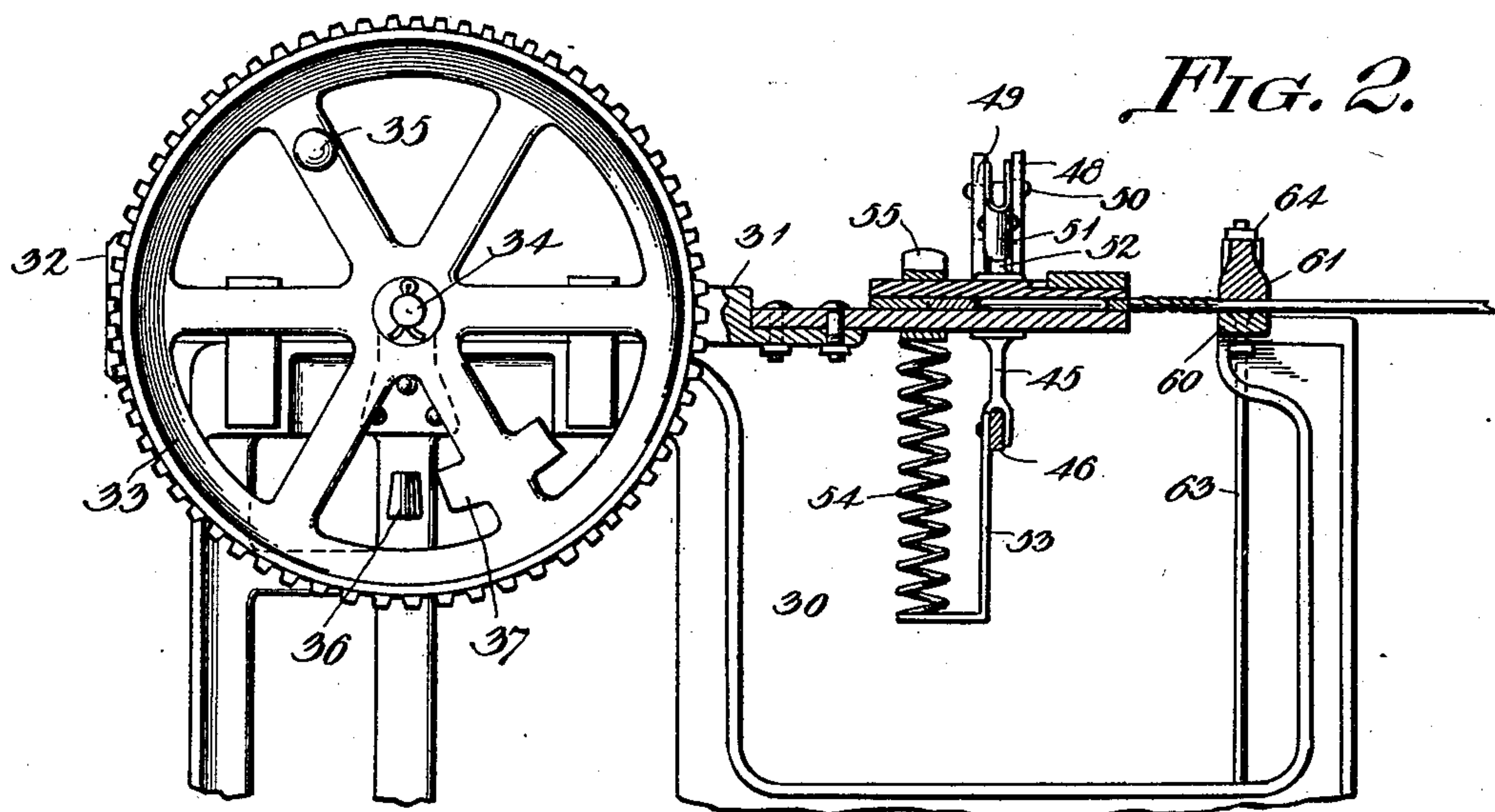
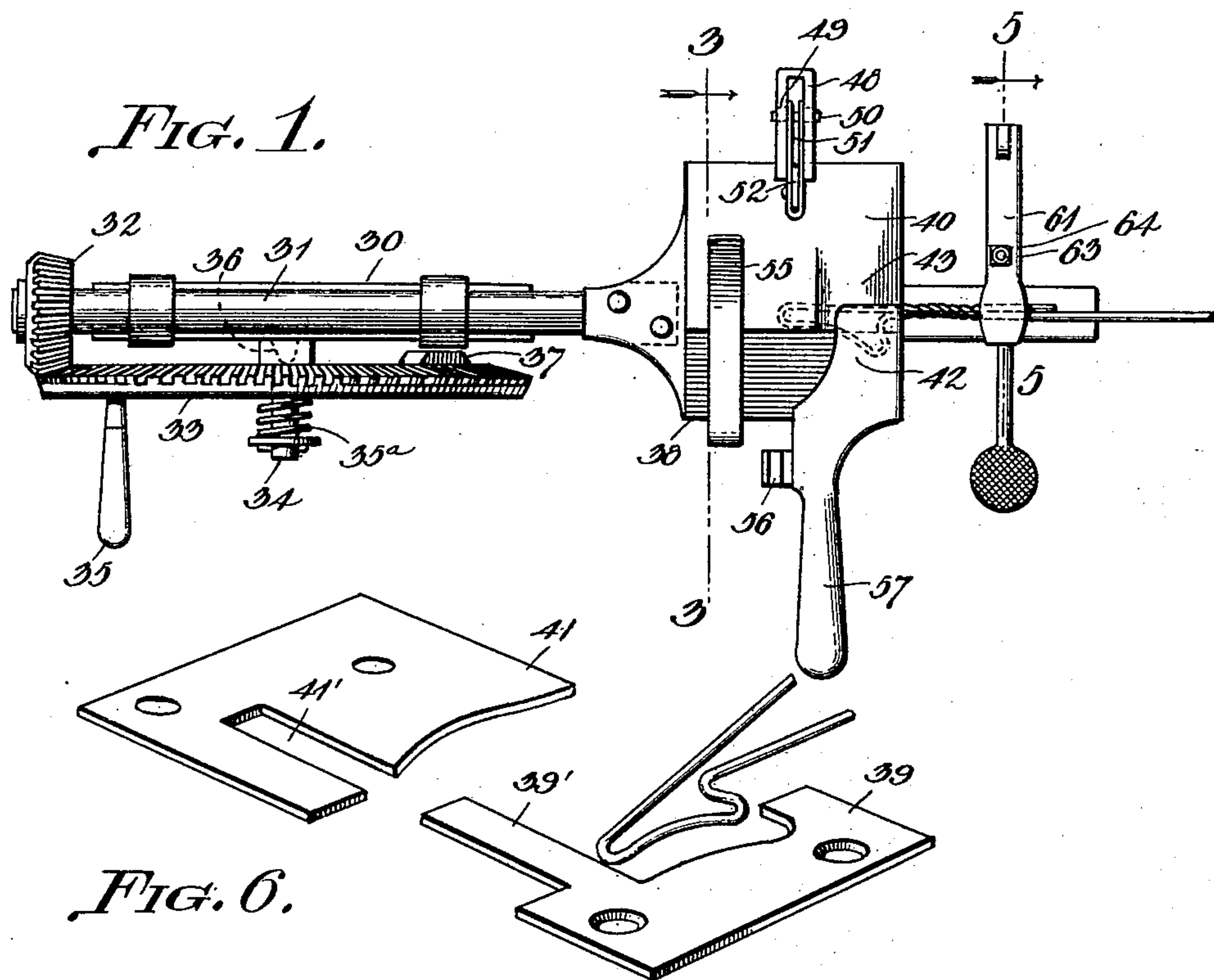
R. J. EIS.

BALE TIE MACHINE.

(Application filed Oct. 31, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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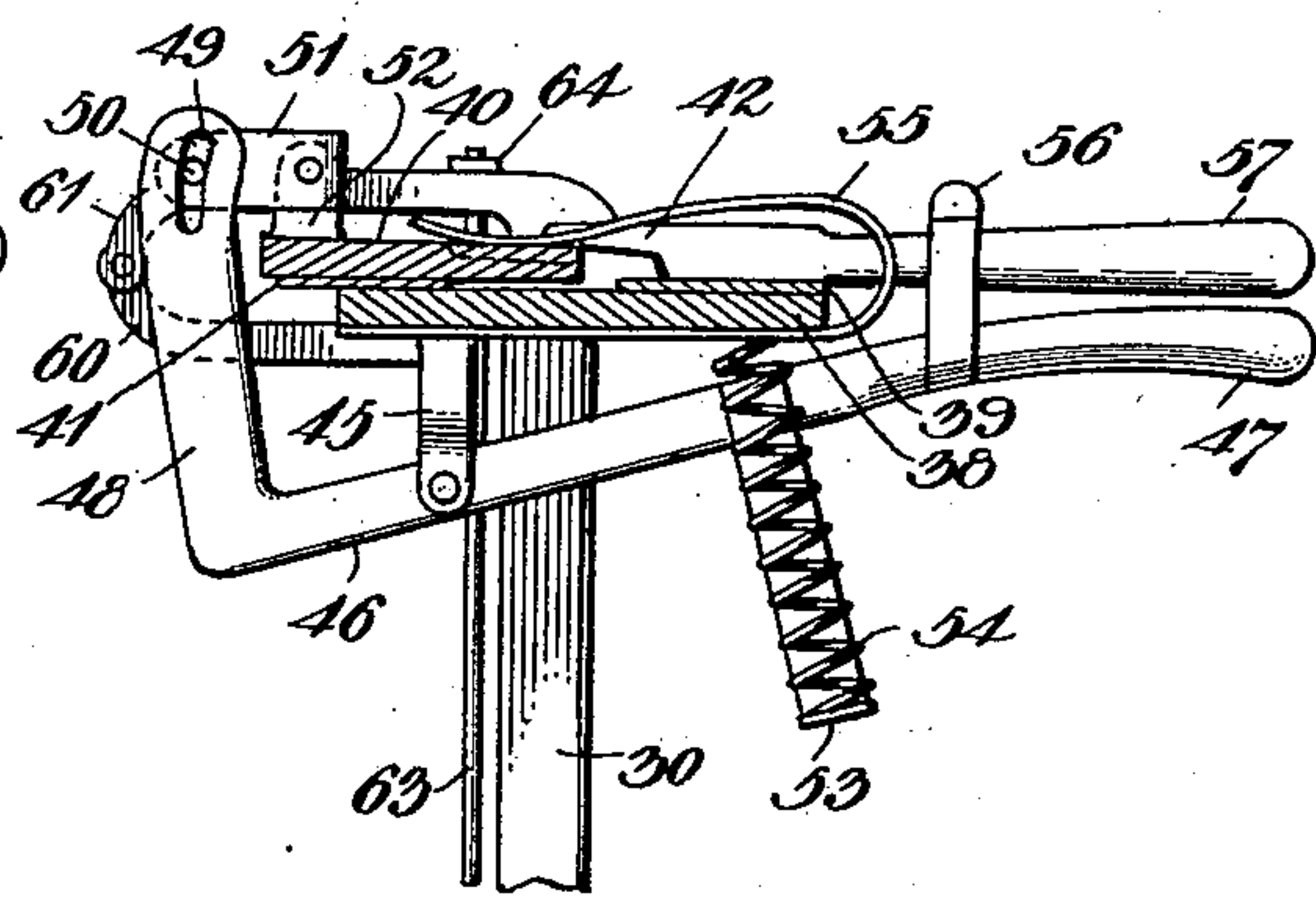
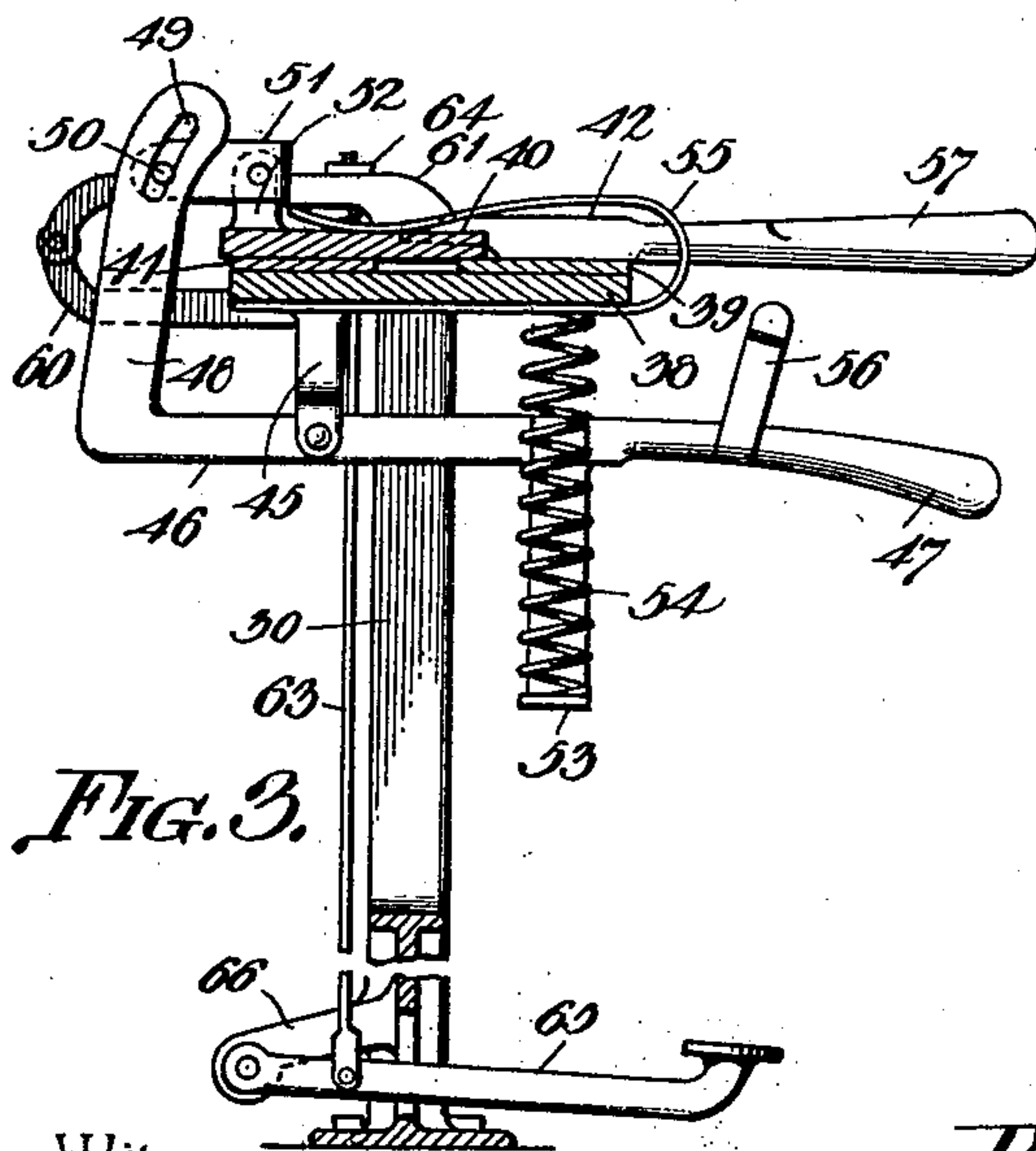
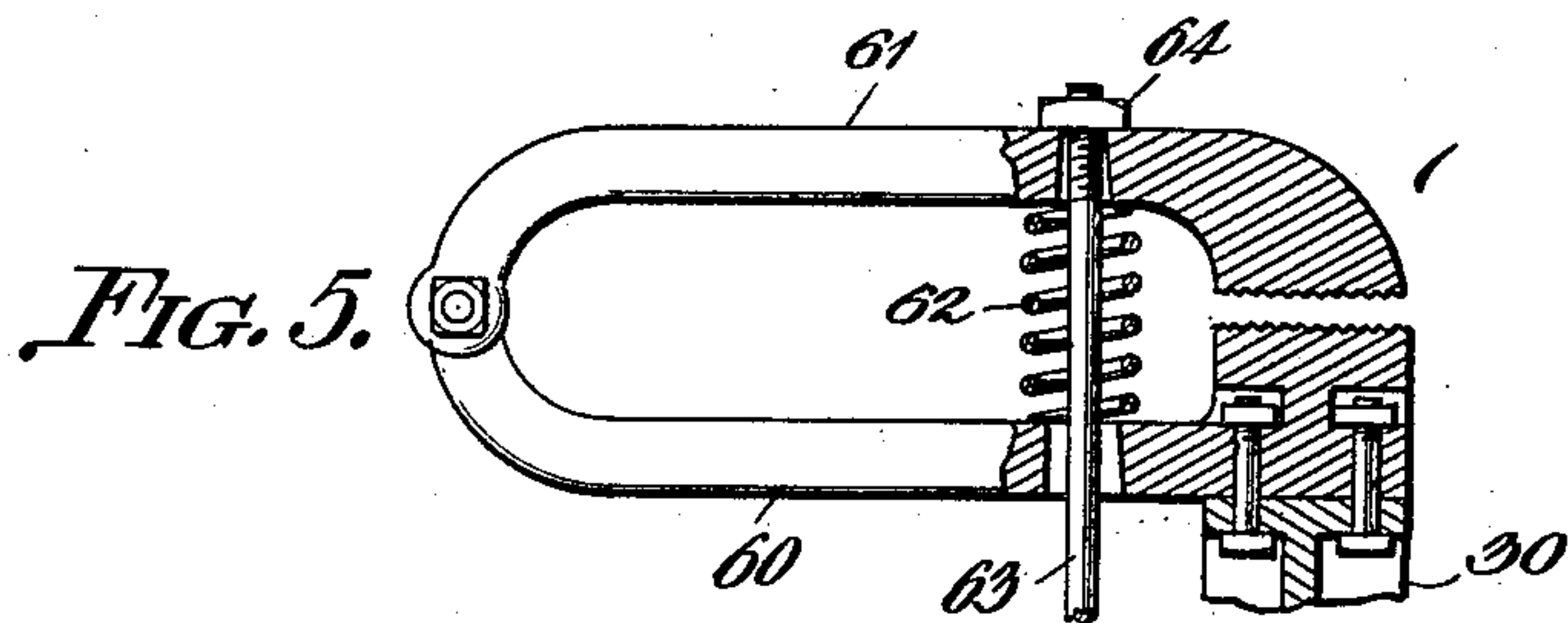
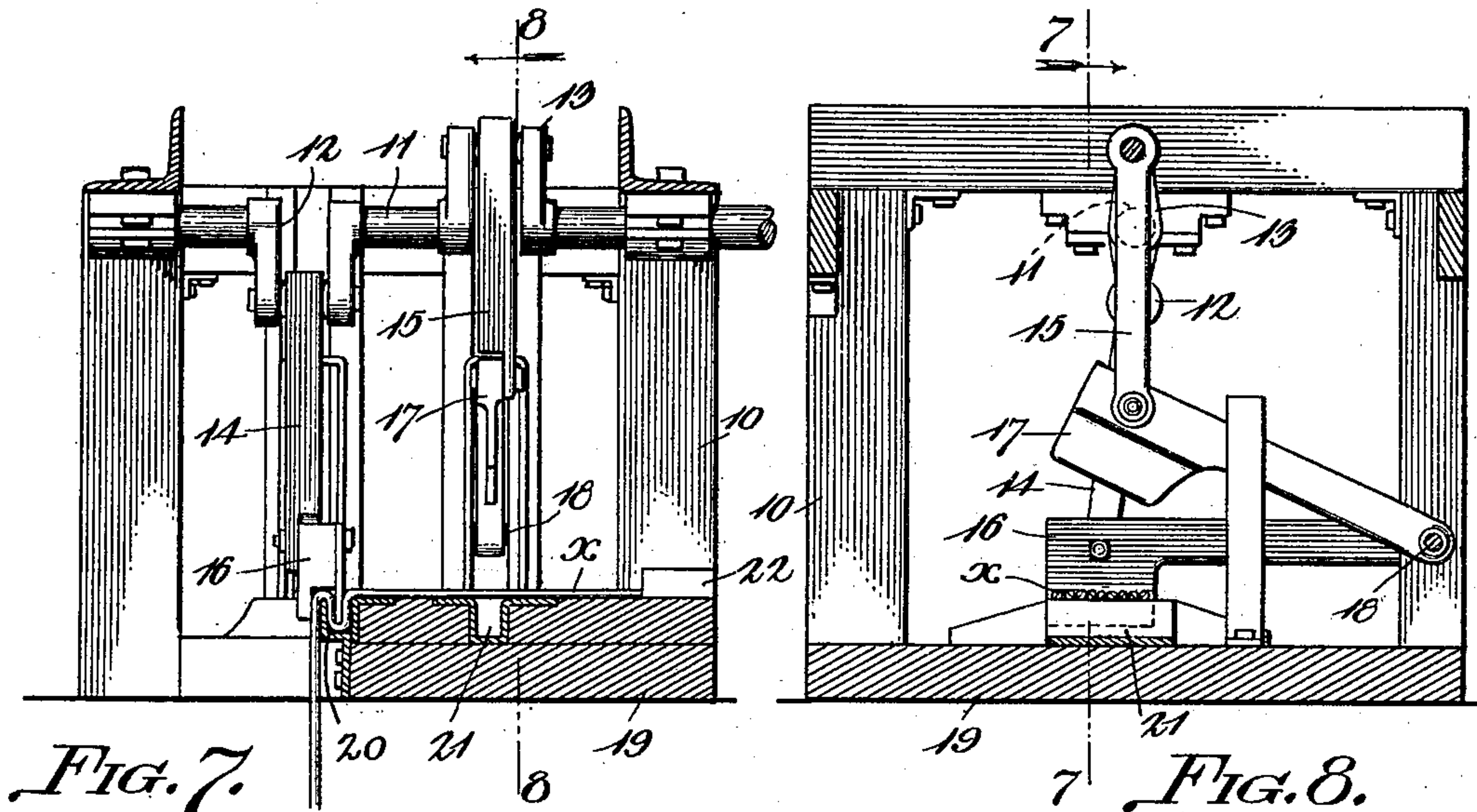
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

REINHOLD J. EIS, OF TWO RIVERS, WISCONSIN.

BALE-TIE MACHINE.

SPECIFICATION forming part of Letters Patent No. 698,695, dated April 29, 1902.

Application filed October 31, 1901. Serial No. 80,695. (No model.)

To all whom it may concern:

Be it known that I, REINHOLD J. EIS, a citizen of the United States, residing at Two Rivers, in the county of Manitowoc and State of Wisconsin, have invented a new and useful Machine for Making Bale-Ties, of which the following is a specification.

My invention relates to certain improvements in apparatus for forming "cross-head hooks" on wire bale-ties, and relates more especially to that portion of the mechanism employed for finishing and twisting the hooked ends.

The principal object of the invention is to provide a simple and economical machine or apparatus in which a partially-formed hook may be properly shaped and at the same time twisted to unite the free end to the body of the wire.

With this and other objects in view the invention consists in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims.

In the drawings, Figure 1 is a plan view of a hook shaping and twisting machine constructed and arranged in accordance with my invention. Fig. 2 is a sectional elevation of the same, a portion of the mechanism being shown in side elevation. Fig. 3 is a transverse sectional elevation of the device on the line 3 3, Fig. 1. Fig. 4 is a view similar to Fig. 3, illustrating the parts in different positions. Fig. 5 is a transverse sectional elevation on the line 5 5 of Fig. 1, illustrating the construction of the wire-holding vise. Fig. 6 is a detail perspective view of the clamping and shaping plates detached from their respective carrying-jaws. Fig. 7 is a sectional elevation on the line 7 7 of Fig. 8, illustrating the construction of the mechanism for effecting the preliminary bending of the hook. Fig. 8 is a sectional elevation of the same on the line 8 8 of Fig. 7.

Similar characters of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The mechanism is designed for the purpose of forming the well-known cross-head hook on the ends of bale tie-wires, and for this purpose the apparatus is divided into two

parts, one of which effects a preliminary bending or shaping of the hook and the other finishes the shaping and effects the twisting necessary to confine the free end to the main portion of the wire.

Referring first to Figs. 7 and 8 of the drawings, 10 represents a suitable framework, in which is journaled a shaft 11, provided with a pair of diametrically opposing cranks 12 and 13, connected by links 14 and 15, respectively, to forming-dies 16 and 17, said dies being carried on arms fulcrumed to a cross-bar or pivot-pin 18 in the lower portion of the frame. In the base 19 are arranged female dies 20 and 21, adapted to coact with the dies 16 and 17, respectively, to effect the preliminary bending of the wires. In the operation of this portion of the mechanism one or more wires, as *x*, are placed on the bed of the machine with their ends in contact with a stop 22, the wires being placed in position just before the die 16 descends and while the die 17 is being raised. The dies 16 and 20 make a double bend in the wire to form the hook portion and are then elevated. The die 17 then coacts with the female die 21 to effect the return-bend of the end of the wire, and said wires are then removed from the machine and subjected to the action of the shaping and twisting mechanism. The wire at this stage of the operation is bent in the manner indicated in Fig. 6, the portions of the wire to be twisted being slightly separated from each other, as shown.

The shaping and twisting mechanism comprises a suitable frame 30, in which is journaled a longitudinal shaft 31, having at one end a pinion 32, intermeshing with a bevel gear 33, mounted on a stud-shaft 34 and provided with a crank-handle 35, or it may be driven by power in any desired manner. The relative diameters of the bevel gear and pinion are such that one rotation of the bevel gear will effect three complete revolutions of the bevel-pinion, this being the number of twists given the hook end. To disengage the gears after one complete revolution of the bevel-gear, the latter may be longitudinally movable on its carrying-shaft and normally held in position to engage the bevel-pinion by a spring 35^a, the frame being provided with a cam 36, adapted to engage a cam face

or block 37, carried by the bevel-gear to effect a longitudinal movement of the gear, and the disengagement of the teeth of the wheels. At the inner end of shaft 31 is secured a hook-clamping jaw 38, the upper surface of which is arranged on the diametral line of the shaft 31, and on the upper surface of said jaw is placed a hook-shaping plate 39 of the character more clearly shown in Fig. 6. The upper jaw 40 of the clamp is provided on its under face with a hook-shaping plate 41, and the construction of such plates is such as to engage with and properly shape the hook and to move the sections to be twisted into close contact with each other. The upper jaw 40 is movable with respect to the lower jaw 38 in order to permit of the insertion of a hook to be shaped and twisted; but when in the fully-closed and clamping position said upper jaw is confined vertically by a stationary clamping-finger 42, having an inclined lower face and adapted to coact with the inclined upper face 43 of the upper jaw.

On the under side of the jaw 38 is a depending bracket 45, to which is fulcrumed a lever 46, having at one end an operating-handle 47 and at its opposite end an upwardly-extending arm 48, in which is formed a segmental slot 49 for engagement with a pin 50, the latter being carried by a link 51, swiveled to a lug 52 on the upper jaw 40. The lever 46 is provided with a spring-carrying bracket 53, in which is seated the lower end of a compression-spring 54, the upper end of said spring bearing against the under side of the jaw 38 and the normal tendency of the spring being to close the jaws in clamping position. This closing movement of the jaws is further assisted by a plate-spring 55, secured to the lower jaw and its upper end bearing upon the upper jaw, said spring permitting of free lateral play of said jaw, but serving to hold the jaws together while the hook to be twisted is being inserted between them. In order to hold the jaws in the open position against the stress of the spring 54, I employ a spring-catch 56, secured to the handle-bend 47 of the lever 46 and adapted to engage with a handle 57, extending laterally from the upper face of the lower jaw and, as shown, formed integral with the finger 42. The handles are normally separated, and the jaws are held in the closed position during the shaping and twisting operation by the spring 54; but when a wire is to be inserted the operator grasps and draws together the handles 47 and 57, permitting the spring-catch 56 to engage with the upper handle and hold the jaws in the open position in readiness to receive a hook.

At a suitable distance from the end of the clamping-jaws and in alinement therewith is a vise, comprising a lower fixed jaw 60, secured to the frame, and an upper movable jaw 61, having an arm fulcrumed to a stationary arm extending from the lower jaw 60 or to any suitable point on the fixed frame of the machine. The jaws are normally held

open by a coiled compression-spring 62, extending between the pivoting-arms, and extending through openings in both jaws is a rod 63, forming a guide for the spring 62 and having a securing-nut 64 at its upper end in contact with the upper surface of the carrying-arm of the movable jaw. The lower end of the rod 63 is connected to a suitable operating-treadle 65, fulcrumed to a bracket 66 at the base of the framework and in convenient position to be depressed by the operator to effect the closing of the jaws of the vise upon the portions of the wire to be twisted.

In the operation of the device the hook, as indicated in Fig. 6, is inserted between the clamping-jaws while the latter are in the open position, (shown in Fig. 4,) the extreme end and the body of the wire being placed between the open jaws of the vise. The spring-catch 56 is then released and the spring 54 acts through the lever 46 and its connections to move the clamping-jaws to the closed position, the shaping-plate 41 being moved toward the shaping-plate 39, longitudinal play of such plates being prevented during this movement by the guiding-tongue 39' on the plate 39 and the guiding-recess 41' on the plate 41. When these plates are in closed position, the hook is properly shaped and the free end of the wire is bent in such manner as to force it into close contact with the main body of the wire. The operator then depresses the treadle 65 and firmly clamps the jaws of the vise on the then parallel portions of the wire. The gear-wheel 33 then receives one complete revolution, either by manual or other power, revolving the shaft 31 and the clamping-jaw three times and making three complete twists in the wire, as shown in Fig. 1. The handles 47 and 57 are then pressed together until the spring-catch 56 engages with the latter and holds the clamping-jaws in the open position. At the same time the pressure on the treadle 65 is removed, permitting the vise-jaws to open and release the wire. The fully-formed hook is then removed, and the apparatus is in readiness for the next operation.

While the construction herein described, and illustrated in the accompanying drawings, presents the device in its preferred form, it is obvious that many changes in the form, proportions, size, and minor details of construction may be made without departing from my invention.

Having thus described my invention, what I claim as new is—

1. In a machine for making bale-ties, the combination of the revoluble shaft, a lower jaw carried thereby, an upper clamping-jaw movable with respect to the lower jaw, shaping-plates carried by each of said jaws and adapted to engage with and entirely surround the partly-formed hook, and a vise or clamp adapted to hold the ends of the wire during the rotations of the clamping-jaws, substantially as specified.

2. In a machine for making bale-ties, the

combination with a revoluble shaft, of a clamping-jaw secured to said shaft, an upper clamping-jaw movable with respect to the lower jaw, a spring for closing said jaws, shaping-plates carried by each of said jaws and adapted to engage with and entirely surround the partly-formed hook, and a vise or clamp adapted to hold the ends of the wire during the rotations of the clamping-jaws.

3. In a machine for making wire bale-ties, the combination of the revoluble shaft, a clamping-jaw secured thereto, an upper movable jaw, shaping-plates carried by each of said jaws, an operating-lever fulcrumed to the lower jaw and operatively connected to the upper jaw, a spring extending between said lever and the lower jaw and tending to close the jaws, and a vise or clamp adapted to hold the ends of the wire during the twisting operation.

4. In a machine for making wire bale-ties, the combination of the revoluble shaft, a clamping-jaw secured thereto, an upper movable jaw, shaping-plates carried by each of said jaws, one of said plates being provided with a guiding-tongue and the other with a receiving socket or slot for said tongue, and a vise or clamp for holding the ends of the wire during the twisting operation.

5. In a machine for making wire bale-ties, the combination of the revoluble shaft, a lower clamping-jaw secured thereto, an upper movable jaw, means for moving said jaws to open or closed position, a stationary inclined clamping-finger carried by the lower

jaw and adapted to engage the inclined face of the upper jaw, and a vise or clamp for holding the ends of the wire during the twisting operation.

6. In a machine for making wire bale-ties, the combination of the revoluble shaft, a lower clamping-jaw secured thereto, an upper movable jaw, a fixed handle carried by the upper jaw, a lever fulcrumed to the lower jaw and having a handle portion in proximity to the stationary handle, a spring-catch carried by one of said handles and adapted to engage with the opposite handle, means for operatively connecting the lever to the upper jaw, a spring carried by said lever and adapted to move said upper jaw to closed position, and a vise or clamp for holding the ends of the wire during the twisting operation.

7. In a machine for making wire bale-ties, the combination of the revoluble shaft, a lower clamping-jaw secured thereto, an upper movable jaw, a plate-spring carried by the lower jaw and in operative contact with the top of the upper jaw, means for opening and closing said jaws, and a vise or clamp for holding the ends of the wire during the twisting operation.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

REINHOLD J. EIS.

Witnesses:

W. P. MANIAN,
FRED W. DICKE.