

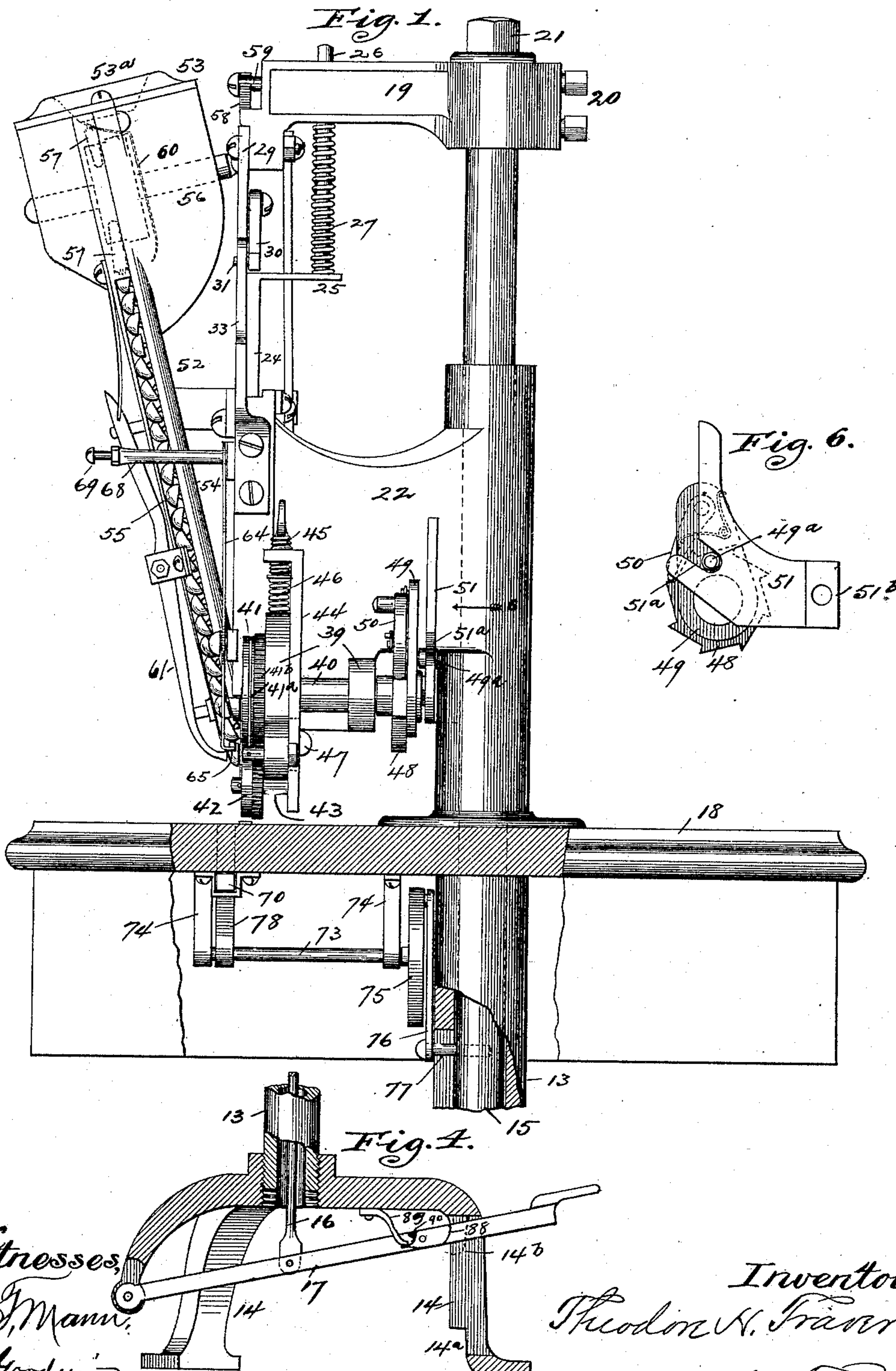
(No Model.)

4 Sheets—Sheet 1.

T. H. TRAVER.
BUTTON SETTING MACHINE.

No. 448,696.

Patented Mar. 24, 1891.



Witnesses,
J. J. Mann,
J. H. Goodwin

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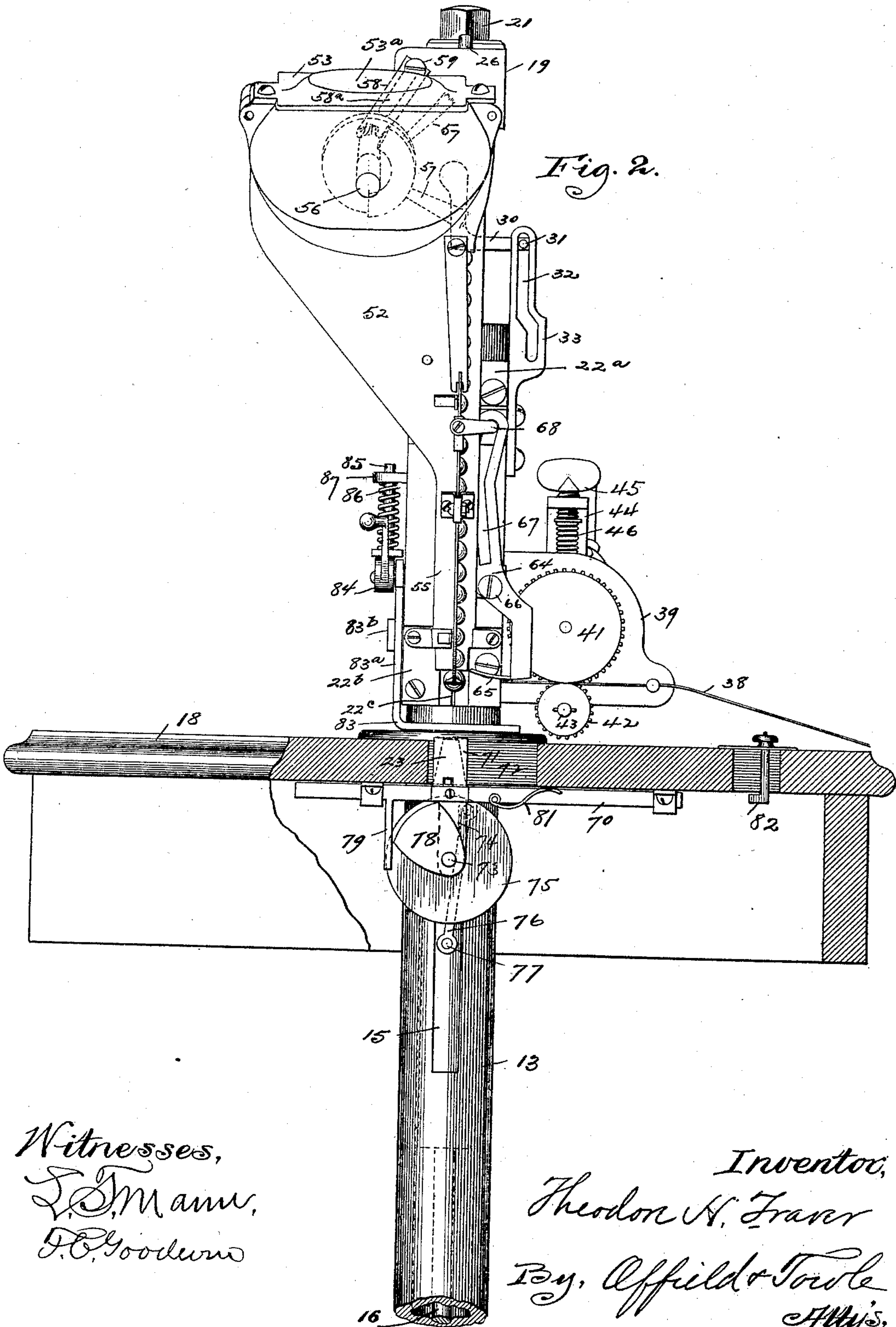
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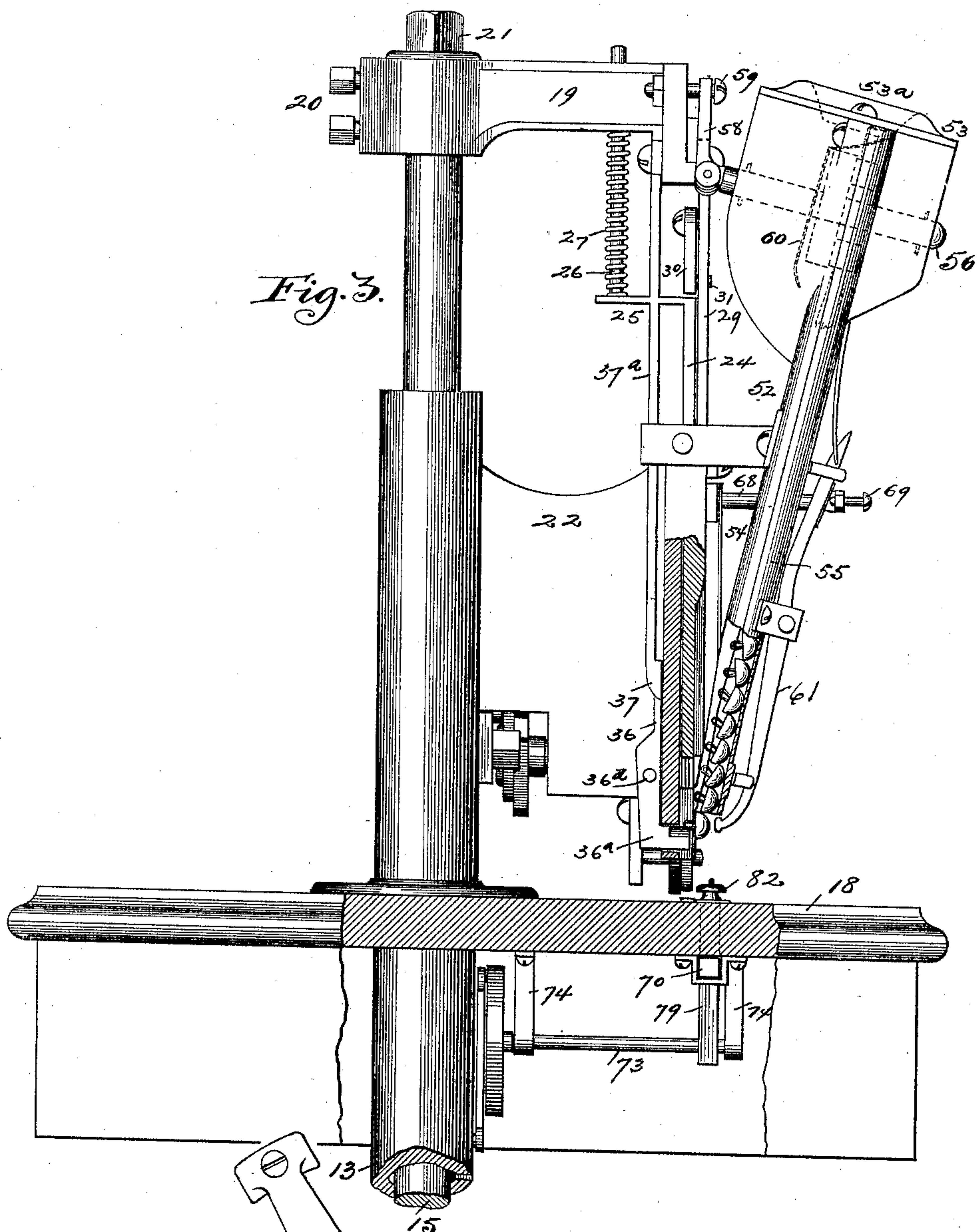


Fig. 3.

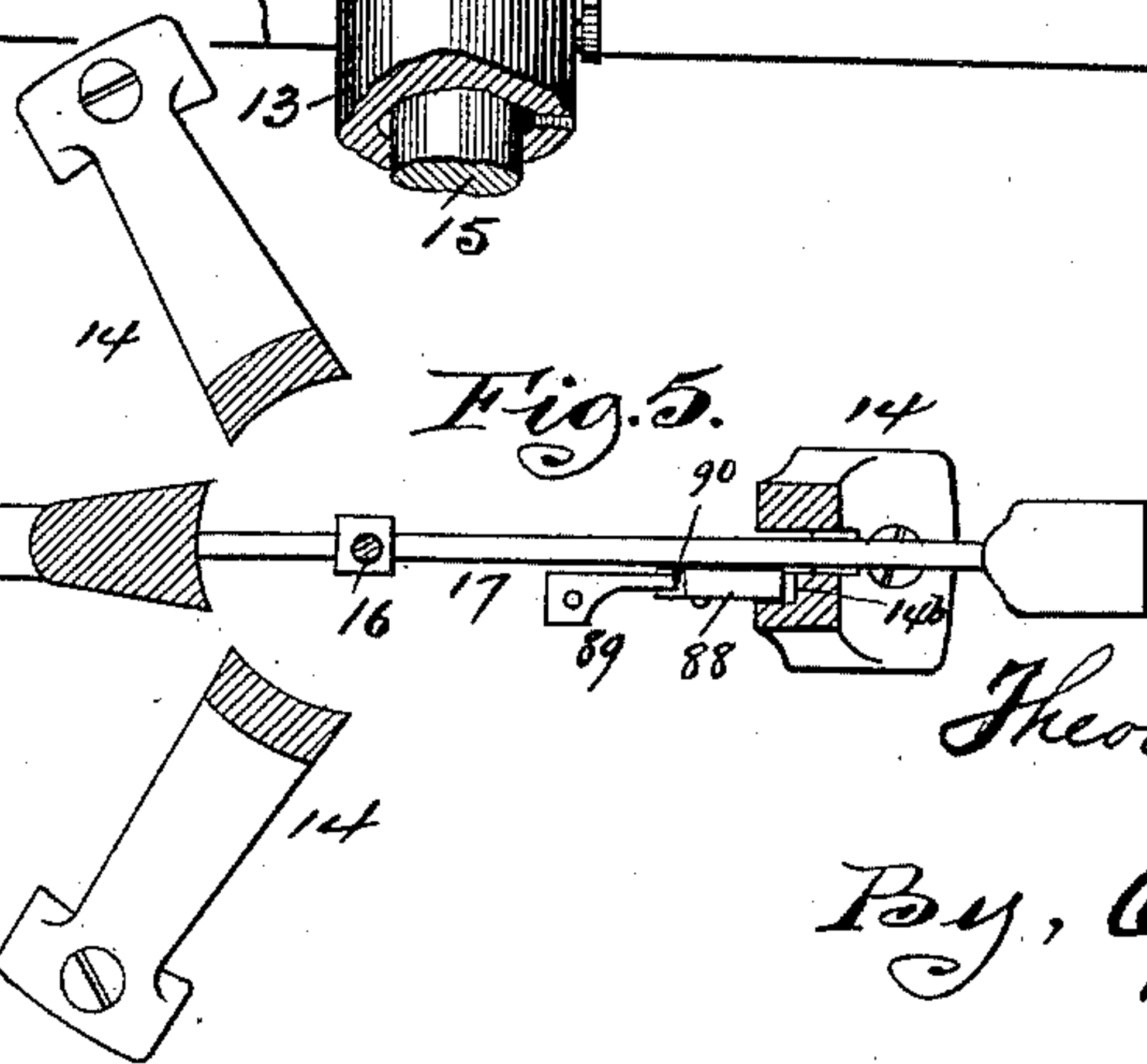


Fig. 5.

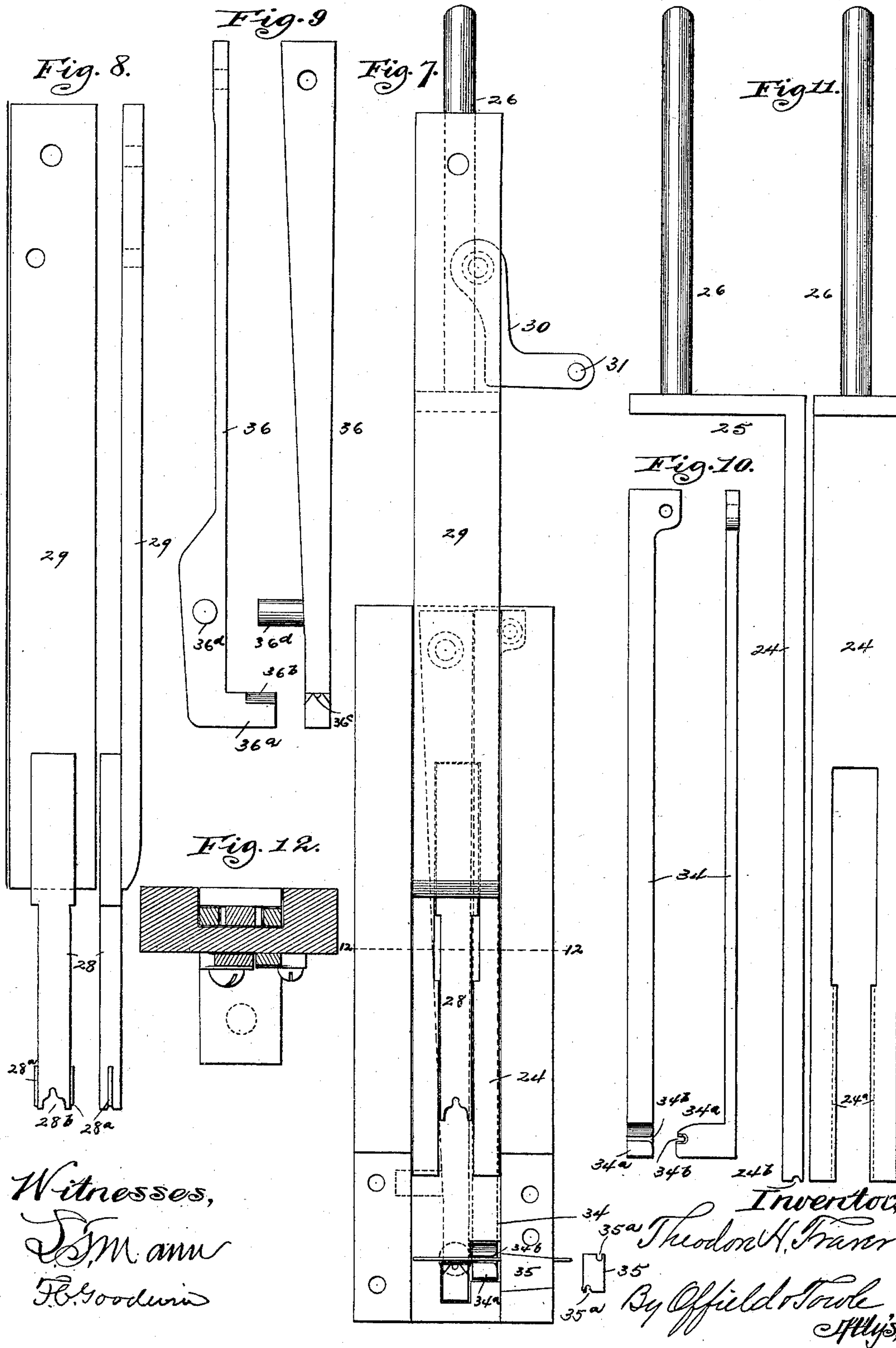
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UNITED STATES PATENT OFFICE.

THEODORE H. TRAVER, OF CHICAGO, ILLINOIS.

BUTTON-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 448,696, dated March 24, 1891.

Application filed May 10, 1890. Serial No. 351,347. (No model.)

To all whom it may concern:

Be it known that I, THEODORE H. TRAVER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Button-Fastening Machines, of which the following is a specification.

My invention relates to certain improved features of a button-machine of the class shown in United States Patent No. 368,419, granted August 16, 1887, to Olds and Eklund; and my invention consists in certain devices and combinations of devices in a machine of this class whereby the buttons are fed one at a time in position to have the staple-wire fed through their eyes, and whereby said wire is severed into staple lengths, the lengths being formed into a staple and the staple, with a button attached, carried down and the legs of the staple forced through the fabric and clinched on its under side at a single stroke or operation of the machine. With the above-named mechanism I have combined in some instances a feed and spacing mechanism, whereby the fabric is moved along as the operation of setting the button progresses.

The particular improvements in the construction of the parts relate more particularly to certain features of the button-holding receptacle and the means for forcing the buttons thereout into a chute or passage-way, which I make open at one side thereof so as to expose the buttons; to certain improvements in the feeding mechanism for the wire from which the staples are formed, said improvements comprising in addition to the usual feed-wheels positive gears for driving said wheels, said gears being driven by a shaft to which is imparted an intermittent rotary motion by means of a ratchet-and-pawl mechanism actuated by the vertically-moving rod which actuates the bars to form and drive the staple; to a spacing mechanism whereby the fabric to which the buttons are attached is fed along over the fabric as the buttons are set, such feed being so regulated that the buttons are spaced equal distances apart along the fabric, and to a locking mechanism for the operating-treadle, so that said treadle must be given a full stroke in either direction, and thereby the possibility of feeding a double portion of wire and of partially form-

ing the staple and the retracting of the cutting and bending appliances, whereby the staple would become wedged into the cutting and bending bar and by it carried up into the machine, is avoided.

In the accompanying drawings, Figure 1 is a side elevation of the machine, partly in section. Fig. 2 is a front elevation, also partly in section. Fig. 3 is an elevation of the side opposite that shown in Fig. 1. The standard is broken away in each of these views. Figs. 4 and 5 are respectively side, sectional, and broken plan views of the lower end of the standard and showing the locking means applied to the treadle. Fig. 6 is a side elevation of the driving mechanism for the feed-wheel gears, looking in the direction indicated by the arrow 6 in Fig. 1. Fig. 7 is a front elevation of a portion of the frame-work, showing also the cutting, bending, and driving bars, the anvil in position, and a wire-guide, and showing, also, at the lower right-hand corner of the figure a shearing-block. Fig. 8 is a front and side elevation of the driving-bar; Fig. 9, similar views of a former; Fig. 10, similar views of a wire-guide; Fig. 11, like views of the cutting and bending bar, and Fig. 12 a cross-sectional reversed plan above the line 12 12 of Fig. 7.

In the drawings, 13 represents an upright hollow standard with supporting-feet 14, through which standard passes a vertically-reciprocating shaft 15, connected at its lower end with a rod 16, pivotally connected with a treadle 17.

18 represents the table.

The shaft 15 projects above the hollow standard 13 and carries on its upper end a short horizontal head 19, which is secured upon shaft 15 by means of the set-screws 20.

21 is an adjusting-nut, which will be threaded onto the upper end of shaft 15, and which being turned in one direction or the other will form a stop against which the head 19 may be set.

22 is a frame or bracket offsetting from the hollow standard 13 and having formed at its outer vertical edge ways within which move the cutting and bending bars and the driving-bar. On the front of said frame and covering the ways are removable face-plates 22^a and 22^b, the latter having a slot 22^c to permit

the button-shank to pass on its way to the anvil.

23 is a stationary anvil over which the work is placed and which anvil will be formed on its upper side so as to bend and clinch the legs of the staple upon the under side of the fabric.

24 is a bifurcated cutting and bending bar whose legs are provided on their inner sides with grooves, (indicated at 24^a, Fig. 11,) and the lower end of one of said legs will be fashioned so as to shear the wire to form the staple-length, and both of said legs will be provided in their lower ends with the grooves 24^b to straddle the wire, so as to hold it securely during the operation of bending and forming the staple. The upper end of this cutting and bending bar is bent, as at 25, and the bent end carries a rod 26, the upper end of which passes through an aperture in the head 19. A coiled spring 27 is interposed between the bent extension 25 and the head 19 and is intended to hold the cutting and bending bar down after it has performed its working stroke until the setting-bar has completed its movement.

The setting-bar is shown in Fig. 8 and its lower end is a thin or flat strip 28, having wings 28^a, which move within the grooves 24^a of the legs of the cutting and bending bar. The lower end of the driver 28 is recessed, as at 28^b, in order to straddle the eye of the button and the crown of the staple. The driver 28 is secured with a flat bar 29, whose upper end is secured by screws to the outer end of the head 19. On the rear side of the bar 29 is a pivoted latch 30 in the form of a bell-crank lever. The horizontal member of the bell-crank lever 30 carries a pin 31, which travels in a cam-slot 32 of the bracket 33, said bracket being secured rigidly with the offsetting frame 22. (See Figs. 1, 2, and 7.) The bell-crank 30 bears at its bend upon the upper end of the cutting and bending bar 24, and in the operation of the machine forces said bar down in advance of the setting-bar whenever the shaft 15 is reciprocated; but when the parts thus locked together have moved down until the cutting and bending bar has performed its function the pin 31 moves into the offset portion of the cam-slot and disengages the bell-crank lever from its bearing on the cutting and bending bar, and thus frees the setting-bar, so that it may be further depressed to set the staple.

Referring now to Figs. 7 and 10, 34 represents a wire-guide, which comprises a bent lever secured at its upper end to the back of the frame 22 and having its lower end bent, as at 34^a, the bent portion being grooved, as at 34^b, for the passage of the wire. This bent end 34^a projects through an opening in the lower part of the frame 22, so as to bring its groove in line with the acting-faces of the cutting and bending and setting bars. The portion 34 of this wire-guide may be a flat steel bar, so that it may be

flexed to remove its extension 34^a out of the way of the leg of the cutting and bending bar, and this leg will be adapted to strike the upper side of the extension 34^a, so as to force it back out of the way. This wire-guide bridges the space between the former and the shearing-block 35, which latter is slipped into a recess in the frame 22, and is provided on two or more of its faces (so as to be reversible when worn) with grooves 35^a for the passage of the wire. The wire is sheared along the inner face of this block 35 by the sharpened edge of one leg of the cutting and bending bar. The staple-former is shown most clearly in Fig. 9 of the drawings, and it comprises a flat bar 36, having a foot 36^a, whose upper side is beveled, as at 36^b, and grooved, as at 36^c. The upper end of the bar 36 is secured with the frame 22, and is made of suitable material, so that it may be flexed, and the foot 36^a projects through an opening in the frame 22, so as to occupy a position at the side of the wire-guide extension 34^a. Its beveled face gives shape to the forming-staple and its groove 36^c receives the eye of the button, while the wire is fed across said groove and through said eye. The staple-former is withdrawn by the engagement of the pin 36^d on its side with the wedge 37 of a bar 37^a, attached at its upper end to the head 19, so as to move therewith. As the head descends, the wedge 37 passes behind the pin 36^d and forces the foot 36^a back out of the way of the driving-bar.

The staples are formed from lengths cut from a continuous wire 38, which may be fed from a reel (not shown) by means of the devices particularly illustrated in Figs. 1, 2, and 6.

39 are brackets projected from the frame 22, and in these brackets bearings are formed for a shaft 40, and said shaft carries on its outer end a combined gear and feed wheel 41. The wheel 41 will have in one portion of its periphery the groove 41^a, and its periphery will also be provided with the gear-teeth 41^b, engaging with the teeth of the gear-wheel 42, which rotates freely on a stud 43, carried by an arm 44, having its upper end threaded and its threads engaged by the set-screw 45, the lower end of which is tapped into one of the brackets 39, and a coiled spring 46 surrounds the lower end of the screw 45. By manipulating the screw 45 the tension of the feed-wheel on the wire may be regulated. The bracket 44 is held to the bracket 39 by a screw 47, passed through an oblong aperture in the bracket 44, so that the latter may play up and down, its movement being regulated by the adjusting screw and spring before mentioned.

The upper end of shaft 40 bears a ratchet-wheel 48, and also a plate 49, which turns freely on the shaft 40 and carries at its upper end a pivoted dog 50, whose lower end engages the teeth of the ratchet-wheel, the dog being confined by the usual spring. On

the plate 49 is a fixed pin 49^a, which travels in a cam-slot 51^a in an arm 51, having an offset portion 51^b, which passes through a slotted aperture in the hollow standard 13 and is secured to move with the reciprocating rod 15. As said rod is reciprocated it is evident that the pin 49^a (which will carry an anti-friction roller) will be moved by reason of its impingement on the wall of the cam-slot 51^a, and when the parts are in the position shown in Fig. 6 and the rod 15 is depressed the pin 49^a will leave its seat in the bottom of the cam-groove 51^a and will be moved forwardly as the arm 51 descends, thus rocking the plate 49, and through the intervention of the dog 50 will turn the shaft 40, advancing the feed-wheel 41 through a space corresponding to the length of the tooth on the ratchet-wheel, thus feeding the wire 38 forward. By the time the wire has thus been fed forward the cutting and bending bar will have descended, and at the completion of the feed of the wire will shear off a length from the latter sufficient to form the staple. As the bending-bar still further descends it will engage the staple length and bend it over the former 36^a, and afterward the cutting and bending bar being released, as before described, the setting-bar will descend and drive the staple through the fabric, clinching its legs upon the under side thereof upon the anvil 23. In the forward feed of the wire its end will be projected through one of the grooves 35^a of the shearing-block 35, thence through the groove 34^a of the wire guide or bridge 34, thence across the former, which latter will have resting thereon the eye of the button, the opening of the eye being presented in position to permit the end of the wire to pass therethrough, and the forward end of the wire will project beyond the staple-former, so that when the length of wire is cut off, as before described, its middle will be centrally over the former.

The buttons will feed one at a time from a reservoir formed by a casing 52, the body of which is made in two parts for convenience in construction and is provided with the removable top 53, having the central opening 53^a. One member of the casing has the downward extension 54, which will be adapted to receive and guide the button-eye and the other member has likewise a downwardly-projecting leg 55, which is cut away on one side throughout its length, so that the heads of the buttons are exposed and any clogging or irregularity in the feed may be corrected by the operator. A rock-shaft 56, is journaled in the casing and extends transversely of the button-chamber and bears thereon the brushes 57. This shaft is rocked by means of a link 58, which is pivotally connected at its lower end to the shaft so that it may swing in the axial line thereof. The slot of the link 58^a receives a pin or screw 59, carried on the head 19, and this link being inclined to the axis of rotation of the shaft, the pin being set eccentrically thereto, the vertical reciproca-

tion of the head 19 will cause the rocking of the shaft in its bearing and by the action of the brushes will sweep the buttons toward the aperture in the bottom of the chamber through which they drop into the chute or passage-way formed by the downward extensions of the casing.

A partition 60 (shown by dotted line in Fig. 1) extends across the button-chamber at right angles to the shaft and from one wall of the opening near the bottom of the chamber, leaving an aperture below its lower end of sufficient size to permit the buttons to pass freely thereunder. The partition divides the button-chamber into two compartments communicating through the opening, in one of which compartments the buttons are placed and in the other the brushes operate to sweep the buttons passing beneath the partition into the opening of the chute or passage-way. This partition moderates the feed of the buttons and prevents their clogging or packing. At the lower end of the chute the button-eye falls into position upon the staple-former, its eye resting in the groove 36^a therein, and to hold the button securely to its side while the wire is being passed through its eye I provide the pivoted lever 61, whose lower end is curved, as shown at 61^a, and is adapted to impinge upon the head of the button. A spring 62 has its upper end secured to the button-chute and its lower end engages the upper end of the lever 61. The buttons are separated by means of a lever 64, carrying a thin bar or foot 65 at its lower end, and it has above its pivot 66 a cam-slot 67. This button-separating lever is rocked on its pivot by means of an arm 68, one end of which is attached to the driving-bar and the bent end thereof projects out and passes through the slot 67, and thence outside of the upper end of the lever 61 and carries a regulating-screw 69. As the driver moves down, carrying the pin 68 with it, it rocks the separating-lever on its pivot and causes its foot to pass between the lower button and the one next above it in the column, thereby sustaining the column while the separated button is being attached. On its downward movement the bent end of the pin 68 releases the lever 61 and permits its grooved end to force the separated button inwardly and hold it firmly to its seat on the former, and on its return movement said pin will again rock lever 61 on its pivot, moving its foot out sufficiently to permit a button to drop down to place on the former.

The spacing mechanism which I have provided is particularly shown in Figs. 1, 2, and 3 of the drawings, and it comprises a longitudinally-reciprocating feed-bar 70, which is shackled to the under side of the table and carries on its upper side a feed-dog 71, which moves with bar 70, reciprocating in an aperture 72 in the table. A to-and-fro movement is imparted to this feed-bar by means of a shaft 73, carried by the hangers 74, and having on its end a crank-wheel 75, with whose

wrist-pin a pitman 76 is connected, the lower end of said pitman being pivoted upon a pin 77, secured with the reciprocating shaft 15. The shaft 73 bears a cam 78, which is adapted 5 when the shaft is rotated to engage once during each revolution with an extension 79 on the feed-bar, and also with the under side of said bar. This cam is a disk-segment, and in the revolution of the shaft one of its points 10 will engage with the extension 79 to move the feed-bar in one direction, and the forward movement which forces the material along is caused by the impingement of the pin of the cam 78 upon the under side of the feed-bar. A spring 81 may be used to cause the 15 positive depression of the feed-bar and the disengagement of the feeding-dog from the material, and thereby to regulate the feed. 82 is an adjustable stop to regulate the feed. 20 83 is a presser-foot which is adapted to rest on the top of the fabric being operated upon, and it has an upper extension 83^a, which has a sliding connection at 83^b with the frame 22, and the upper end of this extension 83^a is 25 pivotally connected with an adjustable device comprising a cam-lever 84, pivoted to the frame of the machine. A brake-rod 85 is seated at its lower end on the periphery of the cam, and a coiled spring 86 is seated 30 against a bracket 87, projecting also from the side of the frame and upon the foot of the brake-rod 85. The presser-foot and feed mechanism above described will be used chiefly in attaching buttons to uppers, and 35 may be dispensed with when buttons are to be applied to finished shoes.

A locking mechanism is applied to the treadle for the purpose of preventing less than a full stroke thereof, and this locking 40 mechanism comprises a dog 88, pivoted on the side of the treadle 17 and adapted to bear at its upper end against the foot 14 of the machine, which is vertically slotted for the passage of the treadle through it, as shown in 45 Figs. 4 and 5. On the downstroke this dog will ride upon the edge of the foot 14, but until a full stroke is made it will prevent the return of the treadle. At the end of the full stroke the dog will be freed from its engage- 50 ment with the foot, the latter being cut away, as shown at 14^a, for this purpose, and the dog will then swing on its pivot, so that the treadle may pass freely until it has completed its upward movement, by which time the inner end of the dog will have been engaged 55 by spring 89, secured on the under side of the base, which will return the dog again into operative position, the foot 14 being cut out toward the upper end of the slot, as shown 60 by the dotted line 14^b, to permit the dog to be righted. A pin 90, set on the side of the treadle, acts as a stop to limit the swing of the dog.

I claim—

65 1. In a button-setting machine, the combination, with means for feeding the buttons singly in position to receive a staple-wire,

of means for feeding said wire intermittently through the eye of the button, a cutting and bending bar for severing the wire into a staple 70 length and forming it into a staple, and a setting-bar for driving the legs of the staple with the button attached through the fabric and clinching it beneath, an anvil whereon the legs of the staple are clinched, a fabric- 75 feeding and button-spacing mechanism comprising a reciprocating feed-bar having a feeding-dog and an extension adapted to be engaged by a cam, a shaft bearing a cam to engage the extension, a disk on said shaft hav- 80 ing an eccentric-pin, and a pitman connected to the pin and to the shaft, which drives the cutting and bending and setting bars and adapted to actuate said feed after the button has been set, substantially as described. 85

2. In a button-setting machine, the combination, with a chute or passage-way in which the buttons are formed in column, of means for separating said buttons, a pivoted lever having an end adapted to impinge on the 90 head of the lower button of the column, a spring adapted to normally press said end against the button, a releasing device comprising an arm secured at one end with a moving part of the mechanism and its other 95 end adapted to engage the upper end of the pivoted lever during the upstroke, and a set-screw in said engaging end, whereby the movement of the pivoted lever may be regulated, substantially as described. 100

3. In a button-feeding device for button-setting machines, the combination, with a casing to provide a button-receptacle, said receptacle having a transverse partition extending 105 across between its side walls from the opening to near its bottom, whereby to divide the receptacle into two compartments having communication through the opening, of a rock-shaft journaled in said casing transversely to the partition and having brushes operating 110 within one of the compartments to sweep the buttons passing through the aperture below the partition into the chute or passage-way, and means for operating the shaft, substantially as described. 115

4. In a button-feeding device for button-setting machines, the combination, with a casing to provide a button-chamber, of a rock-shaft journaled in said chamber and provided 120 with brushes, a slotted link pivotally connected to the rock-shaft, and a pin connected with a moving part of the machinery and adapted to work in the slot of the link, whereby to rock said shaft within the chamber, substantially as described. 125

5. In a button-setting machine, the combination, with a chute or passage-way in which the buttons are formed in column, of a separating device comprising a pivoted lever having a foot adapted to be projected between 130 the lower button of the column and the one next above it, and said lever having above its pivot a cam-slot and a pin connected with a moving part of the mechanism and projected

into said slot, whereby the foot is projected between the buttons to separate them, substantially as described.

6. In a button-setting machine, the combination, with a staple cutting and bending bar, of a setting-bar and means for locking said bars together during a portion of their stroke, said means comprising a fixed arm having a cam-slot therein, and a bell-crank lever having one member thereof provided with a pin adapted to enter the slot in the bar, its other member connected with the setting-bar and its shoulder adapted to rest on the top of the cutting and bending bar, substantially as described.

7. In a button-setting machine, the combination, with the cutting and bending bar, of a former adapted to support a staple length of wire while being formed into a staple, said former comprising an arm constructed from a resilient material and having a foot at its lower end adapted to normally project into the path of the cutting and bending bar in position to support the staple length, and a tripping device comprising an arm secured with a moving part of the machine and having its end adapted to engage with the bar, carrying the former on the downstroke of the machine, whereby to withdraw its foot after the staple has been formed, substantially as described.

8. In a button-setting machine, the combination, with means for feeding the buttons singly in position to receive a staple-wire, means for feeding said wire intermittently through the eye of a button, a cutting and bending bar for severing the wire into staple lengths and forming it into staples, and a setting-bar for driving the legs of the staple through the fabric, and an anvil whereon the legs of the staple are clinched, of a feeding and spacing mechanism comprising a reciprocating feed-bar having a feed-dog secured therewith, said bar being connected to and actuated by the power which sets the button, and an adjustable stop whereby to regulate the feed, substantially as described.

9. In a machine for attaching buttons by means of wire staples cut from a continuous

wire, the combination of means for feeding the wire intermittently through the eye of the button, with a reciprocating cutting and bending bar, a shearing-block secured at the side of the path of said bar, said block being grooved on two or more of its faces, whereby it is adapted to be reversed when worn, a setting-bar for driving the legs of the staple through the fabric, and an anvil whereon the legs are clinched, substantially as described.

10. In a button-setting machine, the combination, with means for feeding the wire forward intermittently to form a staple, a cutting and bending bar for severing the wire into staple lengths and forming the staple, and a reciprocating setting-bar for driving the staple down with the button attached and forcing its legs through the fabric, and an anvil whereon said legs are clinched, of means for preventing the working of the machine except upon a full stroke, said means comprising, in combination with the operating-treadle, a pivoted dog adapted to slide freely over an adjacent fixed part of the downstroke and adapted to swing on its pivot at the close of said stroke, whereby to permit the return of the treadle, substantially as described.

11. In a button-setting machine, the combination, with means for feeding the wire forward intermittently to form a staple, a cutting and bending bar for severing the wire into staple lengths and forming the staple, and a reciprocating setting-bar for driving the staple down with the button attached and forcing its legs through the fabric, and an anvil whereon said legs are clinched, of the treadle, a pivoted dog and a pin to limit the swing of said dog, an adjacent fixed part against which one end of the dog is adapted to impinge on the downward stroke, and a spring secured with the frame-work of the machine and adapted to return the dog to normal position at the close of the upstroke, substantially as described.

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Witnesses:

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