

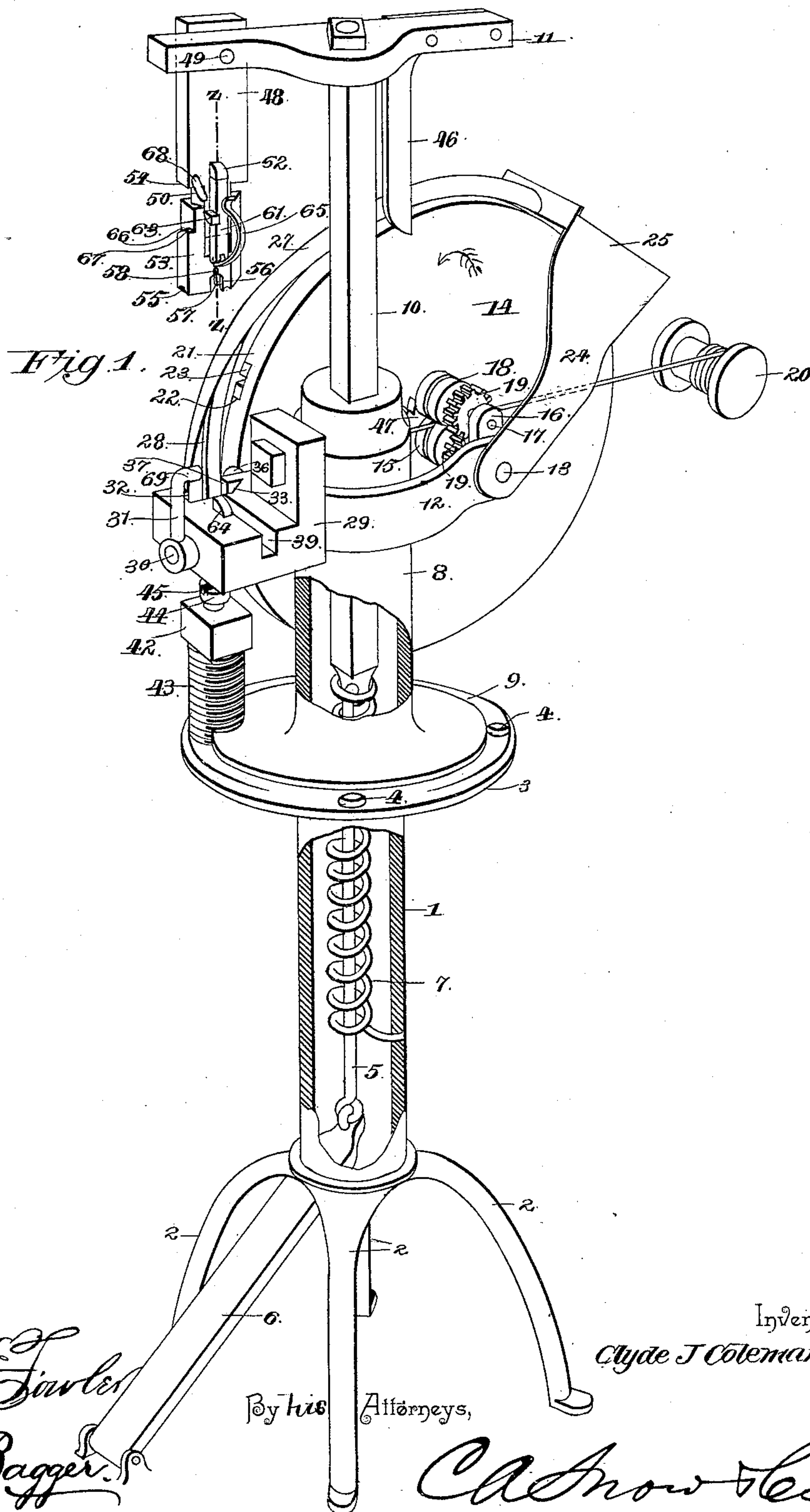
(No Model.)

4 Sheets—Sheet 1.

C. J. COLEMAN.
BUTTON SETTING MACHINE.

No. 432,374.

Patented July 15, 1890.



Witnesses

M. L. Fowler
Wm. Baggett

By his Attorneys,

C. A. Snow & Co.

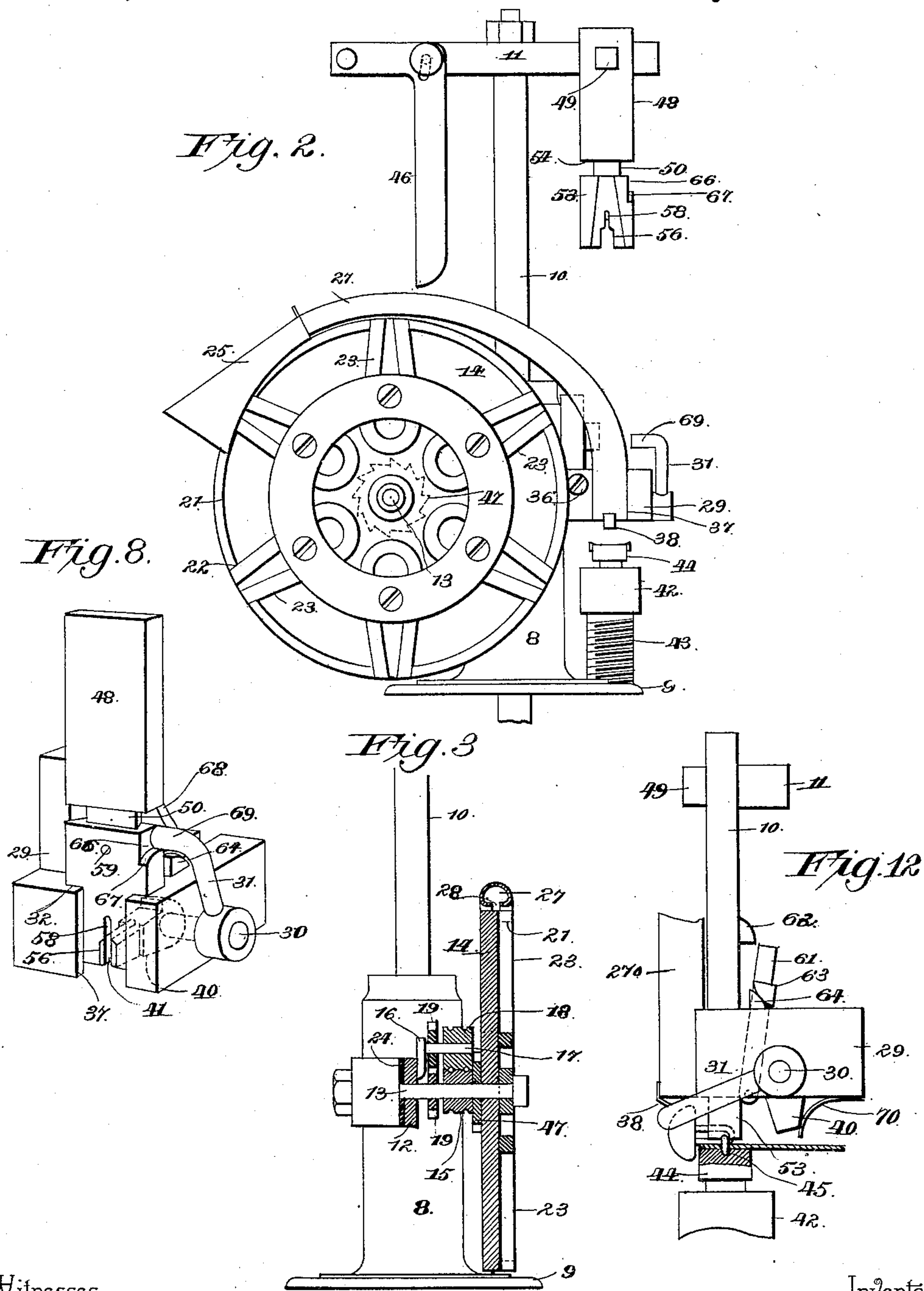
Inventor

Clyde J. Coleman

4 Sheets—Sheet 2.

No. 432,374.

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Witnesses

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Inventor

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(No Model.)

4 Sheets—Sheet 3.

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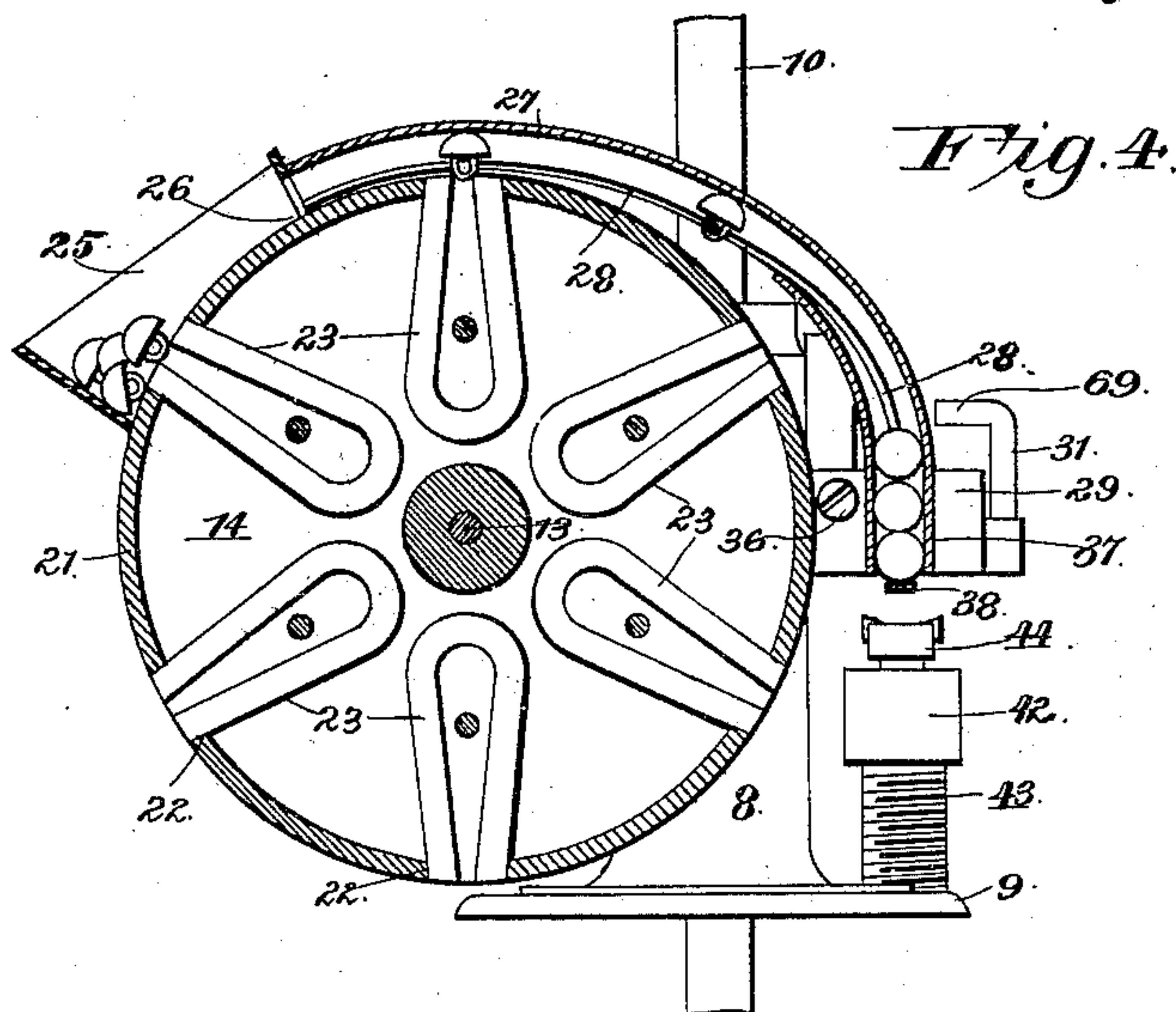


Fig. 5.

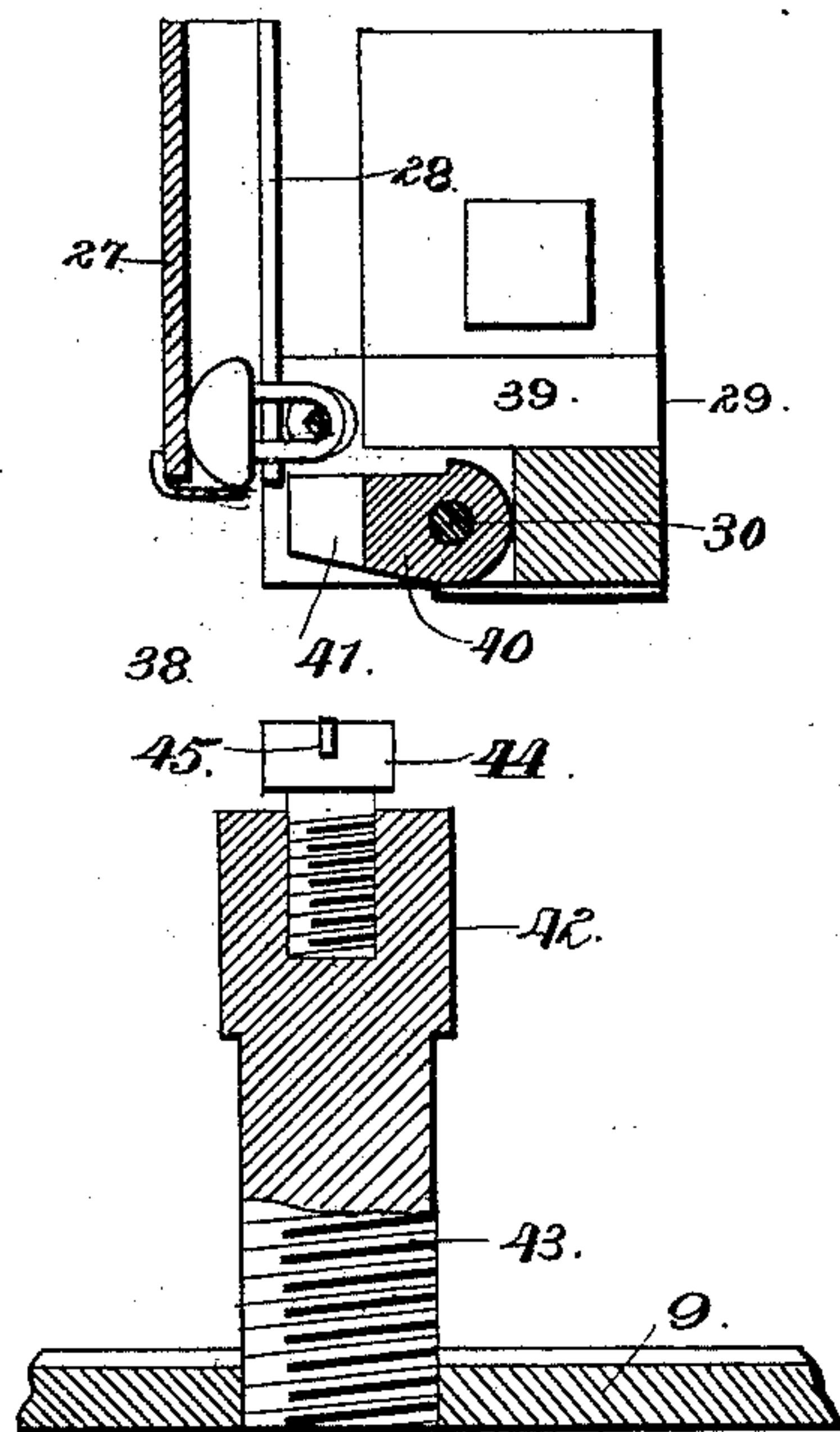
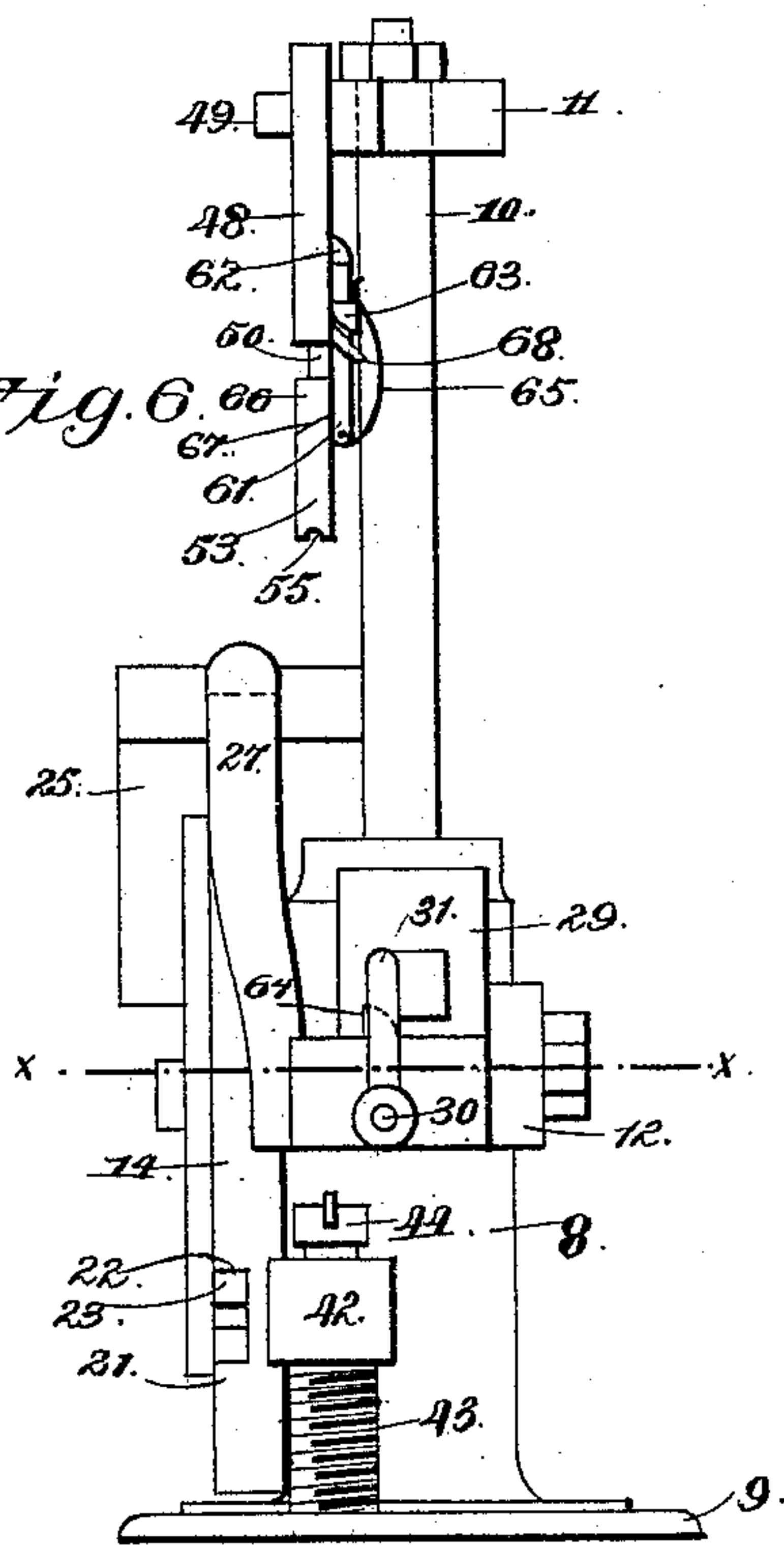


Fig. 6.



Witnesses

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Wm. Bagger

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Clyde J. Coleman

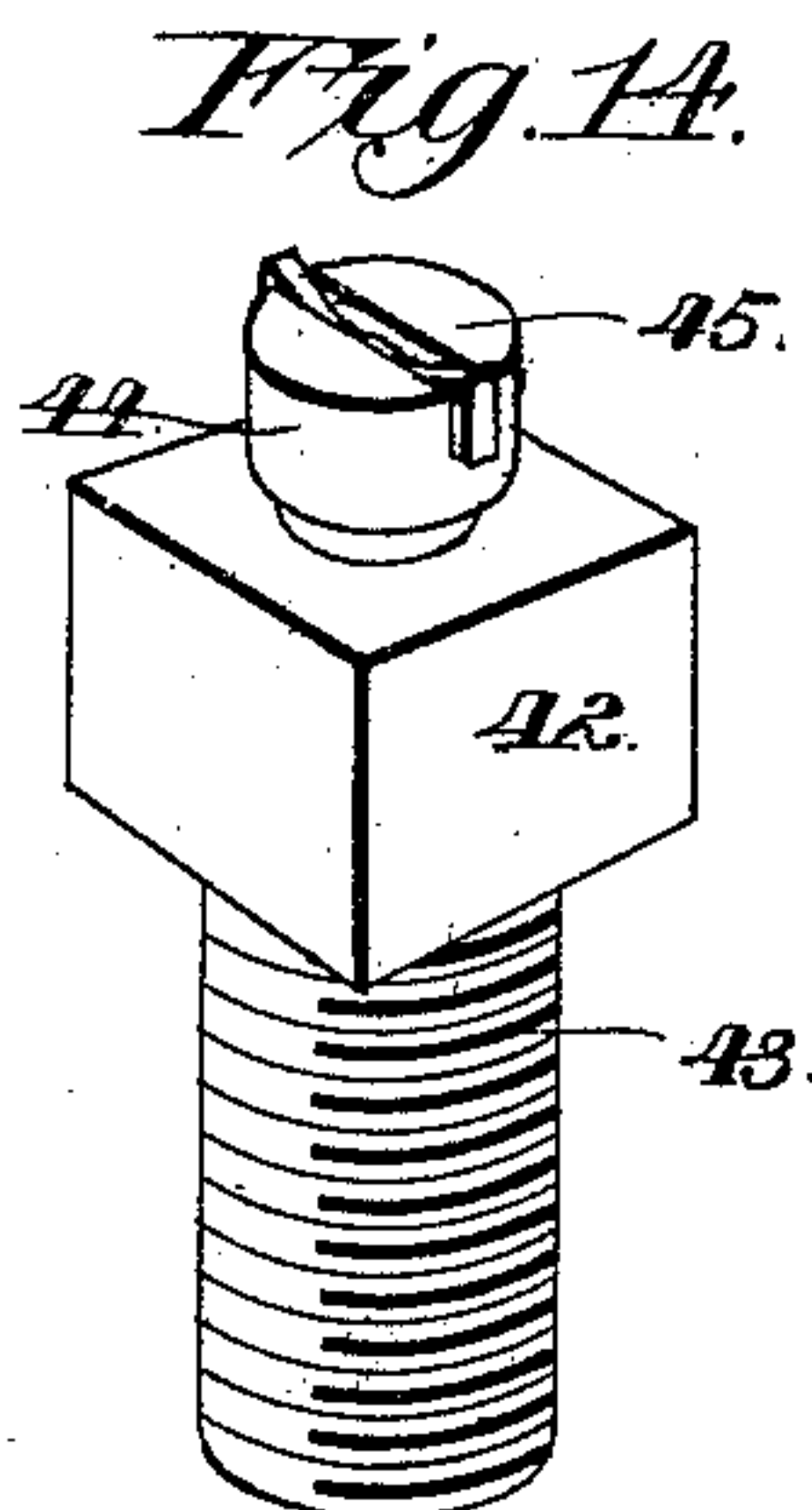
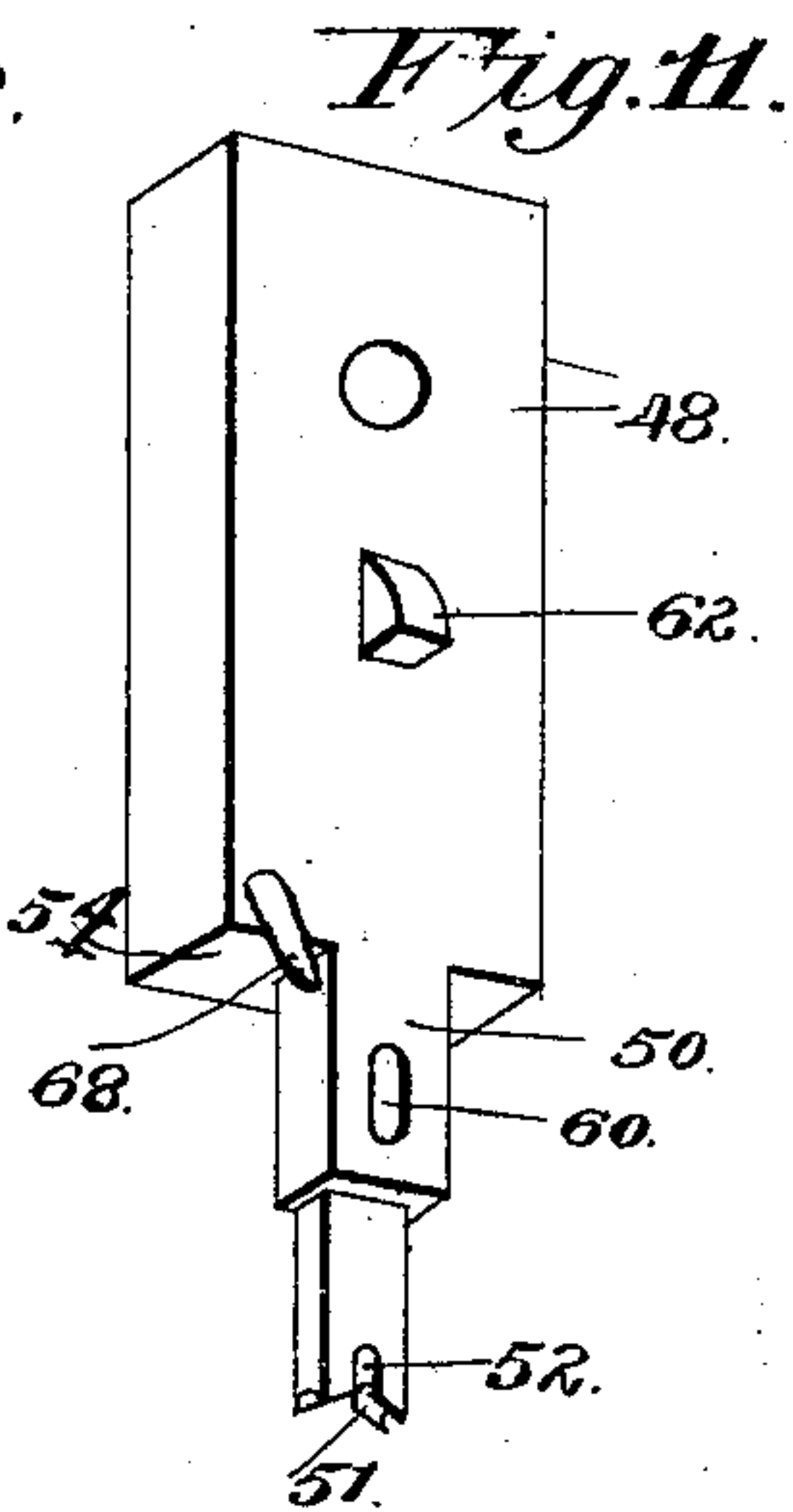
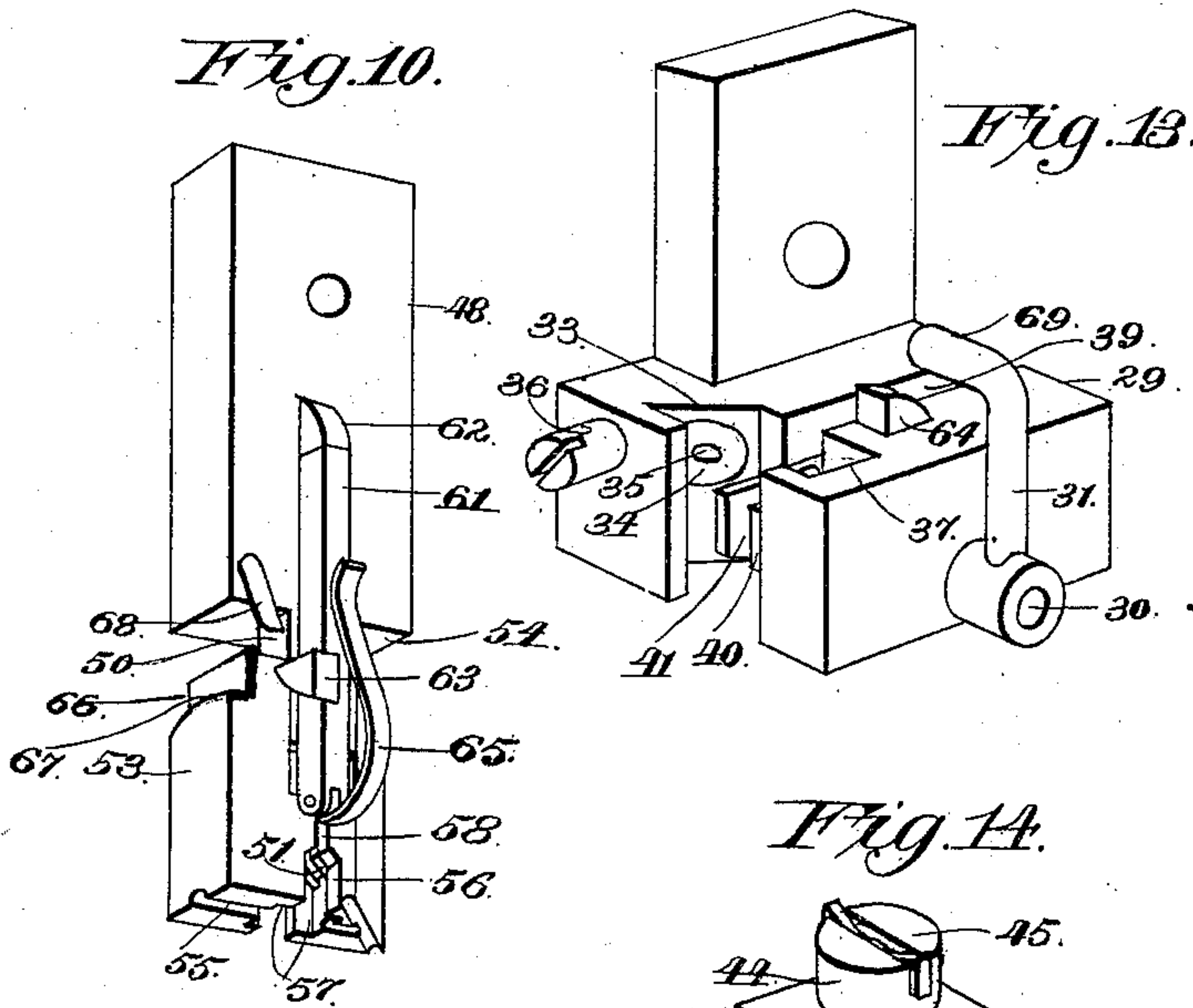
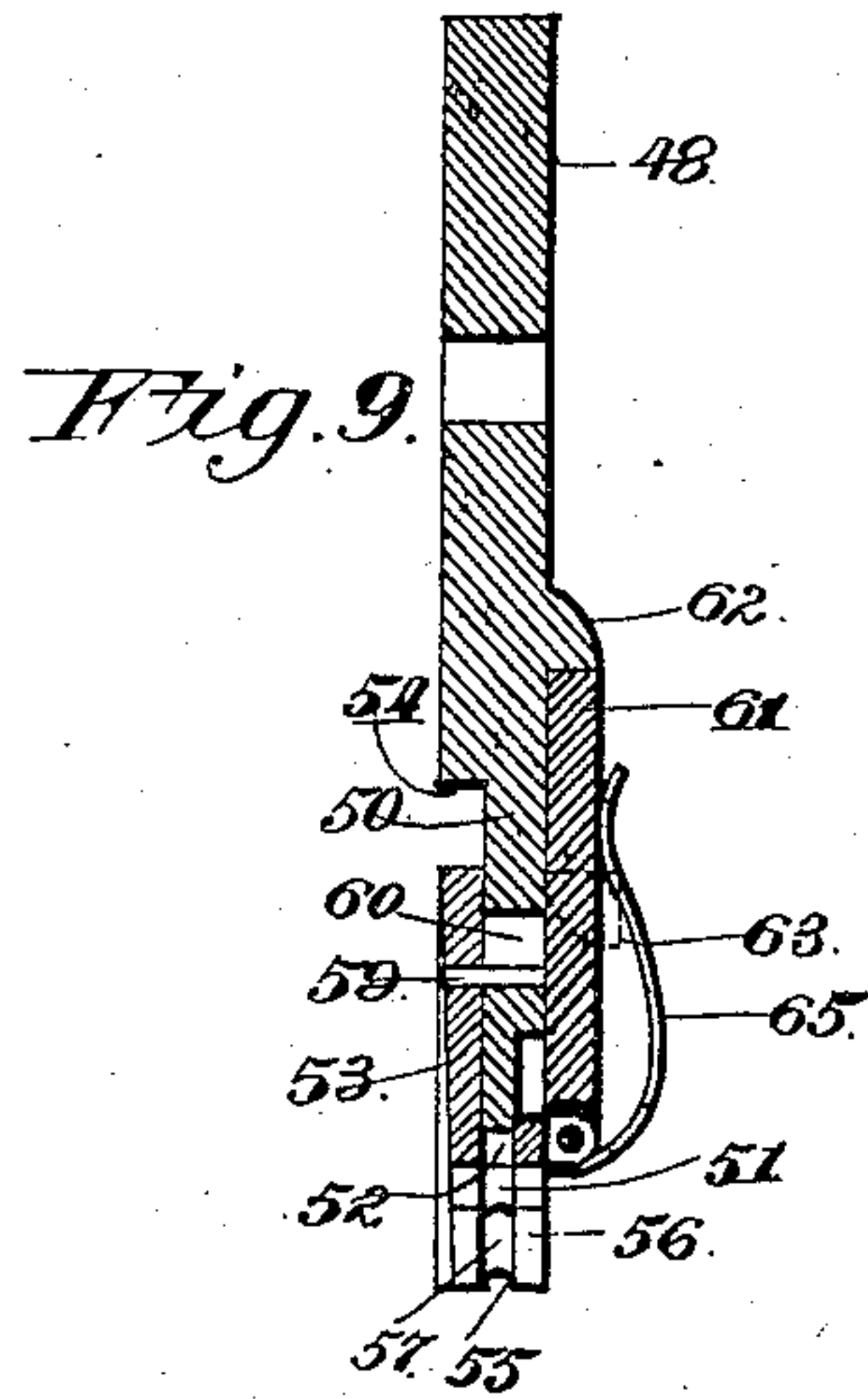
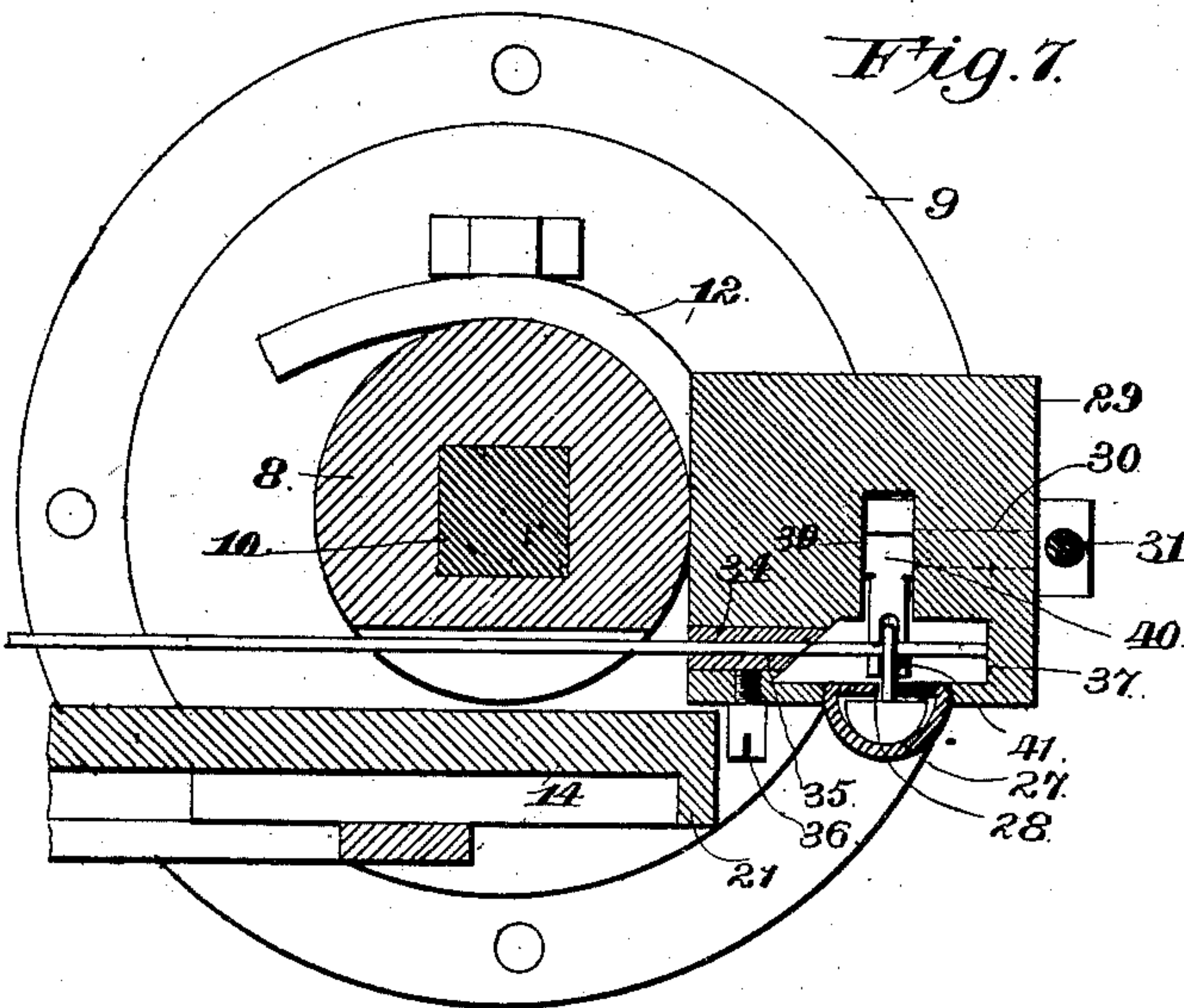
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4 Sheets—Sheet 4.

C. J. COLEMAN.
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Witnesses

M. Fowler

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C. J. Coleman

Inventor

Clyde J. Coleman

UNITED STATES PATENT OFFICE.

CLYDE J. COLEMAN, OF GIDEON, KANSAS, ASSIGNOR OF ONE-HALF TO
CLARENCE W. COLEMAN, OF SAME PLACE.

BUTTON-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 432,374, dated July 15, 1890.

Application filed August 3, 1889. Serial No. 319,668. (No model.)

To all whom it may concern:

Be it known that I, CLYDE J. COLEMAN, a citizen of the United States, residing at Gideon, in the county of Douglas and State of Kansas, have invented a new and useful Machine for Attaching Buttons, of which the following is a specification.

This invention relates to machines for attaching buttons; and it has for its object to construct a machine of this class in which the buttons shall be automatically fed from a receptacle or hopper into a slotted tube, by means of which they shall be conveyed to and held in the desired position while wire is being threaded through the eye of each successive button, by which the wire shall be severed and formed into staples, and by which the said staples shall be driven through the material or fabric to which the buttons are to be attached and clinched.

The invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a perspective view of my improved machine for attaching buttons. Fig. 2 is a side view of the opposite side of the same. Fig. 3 is a vertical sectional view taken through the feeding-wheel. Fig. 4 is a vertical sectional view taken through the feed-tube and feed-wheel at right angles to Fig. 3. Fig. 5 is a vertical sectional view taken through the plunger and anvil. Fig. 6 is a front elevation. Fig. 7 is a horizontal sectional view taken on the line $x x$ in Fig. 6. Fig. 8 is a detailed perspective view of the bench, the plunger forced down. Fig. 9 is a sectional view of the plunger, taken on the line $z z$ in Fig. 1. Figs. 10 and 11 are perspective detail views of the plunger. Fig. 12 is a detail view, the plunger at the end of its stroke. Figs. 13 and 14 are detail views of the bench and anvil.

Like numerals of reference indicate like parts in all the figures.

The base of my improved button-attaching machine consists of a tubular standard 1, mounted upon suitable legs or supports 2 2, and having at its upper end a horizontal annular flange 3, which is perforated to receive

bolts 4, by means of which the machine may be attached to the base.

5 designates a rod or plunger arranged to move vertically in the tubular standard and operated by means of a foot-lever or treadle 6, by means of which the said rod or plunger may be moved in a downward direction by the pressure of the foot of the operator. The plunger 5 is retracted or forced in an upward direction by the action of a coiled spring 7, suitably arranged within the tubular casing or standard.

8 designates a casing provided at its lower end with a flange 9, by means of which it is attached to the flange 3 at the upper end of the standard 1. The casing 8 is provided with an angular bearing for a vertically-sliding rod 10, the lower end of which is suitably connected with the upper end of the vertically-sliding rod 5 in the standard 1. The vertically-sliding rod 10 is provided at its upper end with a cross-head 11, carrying parts of the operating mechanism which will be hereinafter more fully described.

12 designates a bracket, which is bolted or otherwise suitably secured to the casing 8 and which extends from the same in a rearward direction, and is provided with a bearing for a transverse shaft 13, carrying the feed-wheel 14 and an annularly-grooved cylindrical roller 15, which constitutes one of the wire-feeding rollers. The bearing of the shaft 13 has an upwardly-extending bracket 16, affording a bearing for a transverse shaft 17, upon which an additional wire-feeding roller 18 is mounted. The shafts 13 and 17 are furthermore provided with spur wheels or pinions 19, meshing together and serving to transmit motion from the shaft 13 to the shaft 17, thus causing the wire-feeding rollers 15 and 18 to be operated simultaneously when the feed-wheel 14 of the machine is in operation. A spool 20, holding the wire, may be mounted upon a suitable bracket in any desired position which shall enable the wire to pass conveniently between the feed-rollers.

The button-feeding wheel, which has been designated by 14, is composed of an annular disk of brass or other suitable material, one of the sides or faces of which is provided with an annular peripheral flange 21, having notches

22, to receive the ends of a series of horse-shoe-magnets 23, which are suitably attached in any convenient manner to the face of the disk 14. A bracket 24, forming an extension of the bracket 12, carries a suitably-constructed hopper 25, the bottom of which is provided with a slot 26, to admit the rim of the disk 14, with its flange 21. It will be seen that when the wheel or disk 14 is rotated the magnets 23 will successively pass through the slot 26 and finally escape at the upper or front end of the hopper.

To the upper front end of the hopper, and registering with the slot 26, is suitably attached one end of the button-feeding tube 27. Said tube, which may be constructed of suitable metal, is provided with a slot 28, extending through its entire length. The upper or rear of the said slot registers with the front end of the slot 26 in the hopper 25, and the said slot, which has a slight spiral twist, terminates on one side of the said tube, as will be clearly seen in Fig. 4 of the drawings.

The bracket 12 is provided with a forwardly-extending portion 29, which constitutes what I term the "bench" of the machine; or this bench portion may be independently attached to the casing 8. Extending longitudinally through the bench 29 is a shaft 30, the front or outer end of which is provided with an upwardly-extending bent or curved arm 31.

The bench 29 is provided with a vertical opening or recess 32 to accommodate the plunger, which will be hereinafter described, and the rear end of said opening or recess is diagonal, as will be seen at 33. The rear wall of the opening 32 is pierced for the passage of a knife or cutter 34, which extends rearwardly and is provided with a longitudinal groove or opening 35, serving as a wire-guide. The knife or cutter is retained in position by means of a set-screw 36, extending through the side of the bench 29. This enables the said cutter to be conveniently detached whenever desired for the purpose of sharpening the same. The side of the vertical opening 32 is open, as shown, at 37, and in the said opening is secured the lower front end of the button-feeding tube 27, the slot 28 of which terminates adjacent to the said opening 32. The lower end of the button-feeding tube has an inwardly-extending spring 38, which serves to hold in position the button which is to be attached, the said spring permitting the said button to be readily removed from the feeding tube at the proper time. The bench 29 has in its upper side a transverse groove or recess 39, which communicates with the opening 32, and which affords accommodation for an arm 40, extending from the shaft 30 at an angle to the arm 31 at the front end of said shaft. The said arm 40, which forms the mandrel over which the staple is bent, is provided at its outer end with a notch 41, to enable the eye of the button to pass, as will be hereinafter explained.

42 designates the anvil, which may be made

vertically adjustable by means of a screw-threaded support 43, by means of which it is secured to the flange 9 of the casing 8. The top of the anvil has a head 44, provided with a longitudinal notch 45, which is shaped in such a manner as to receive the ends of the staple and to turn and clinch them. In the construction of this device, however, no novelty is herein claimed.

The cross-head 11 of the vertically-reciprocating rod 10 is provided at one end with a pawl 46, adapted to engage a ratchet-wheel 47, which is mounted upon the shaft 13 of the button-feeding wheel 14. It will thus be seen that when the rod 10 is vertically reciprocated an intermittent rotary motion will be imparted to the said button-feeding wheel. This motion does not take place with any absolute regularity, and for reasons which will be presently set forth it is not necessary that such should be the case. The front end of the cross-head 11 carries the plunger 48, which is attached to the said cross-head by means of a bolt 49, and which comprises a plate the lower end of which is reduced so as to form the shank 50, the lower end of which has a V-shaped recess 51, that forms the staple-driver, and which is provided at its apex with a notch 52, for the accommodation of the eye of the button which is being operated upon.

53 designates a slide or plunger, which works vertically upon the stem or shank 50, and which when in a raised position abuts against the shoulder 54 at the upper end of the stem or shank 50. The sliding portion or plunger 53 is adapted to move vertically in the opening 32 in the bench 29 of the machine, the rear side of said plunger being diagonal to correspond with the diagonal rear side of the said opening. The sliding portion or plunger 53 has in its lower side a longitudinal groove 55, for the accommodation of the piece of wire from which the staple is to be formed, and the said sliding plunger is also provided with a transverse opening or recess 56, adapted to fit over the arm or mandrel 40, over which the staple is to be bent, the front and rear walls of said recess being vertically grooved, as shown at 57. The upper end of the recess 56 has an upwardly-extending notch 58, registering with the notch 52 in the stem 50, for the accommodation of the eye of the button which is to be operated upon. The movement in an upward direction of the sliding plunger 53 is limited by the shoulder 54, as above stated. To limit the movement of the said plunger in a downward direction and to prevent it from sliding off the stem 50, it is provided with a pin 59, extending transversely through a slot 60, which is formed vertically in the stem 50. The vertically-sliding plunger 53 is provided at its upper edge, on one side, with the hinged arm 61, adapted to fit against the side of the plunger 48, which latter is provided with a block or projection 62, against which the upper end of the hinged arm 61 may abut when the sliding plunger 53

is at the lower end of its vertical movement. The hinged arm 61 is provided with a laterally-extending cam 63, adapted to engage a corresponding cam 64 on the bench 29, and which serves, when the plunger is moved in a downward direction, to engage the cam 63 and release the arm 61 from contact with the projection 62, thus permitting the plunger 53 to slide or move in an upward direction upon the stem 50. A suitably-arranged spring 65 serves, when the plunger is raised, to restore the arm 61 to its normal position in contact with the block or projection 62. The front side of the vertically-sliding plunger 53 has at its upper end a recess 66, forming a cam-shaped shoulder 67.

The plunger 48 is provided with a cam-shaped projection 68, adapted on the downstroke of the plunger to engage the rearwardly-bent portion 69 of the arm 31, which extends radially from the front end of the shaft 30, journaled longitudinally in the bench of the machine. It will be seen that the relative positions of the arms 31 and 40 are such that when the arm 31 extends in an upward position previous to the downstroke of the plunger the arm 40 extends laterally through the vertical opening or recess 32 in the bench 29 at a point directly below the wire which is being fed forward through the guide or groove 35 in the cutter 34. When the plunger is on its downstroke, the pressure of the plunger against the arm 40 will rock or oscillate the shaft 30. At the same time the cam or projection 68 strikes the bent portion 69 of the arm 31, thereby guiding the said bent portion over the shoulder 67 of the plunger 53. A spring 70 is suitably arranged to restore the shaft 30 and its arms 31 and 40 to their normal position when the plunger moves in an upward direction.

My improved button-attaching machine is operated by means of a treadle 6, which serves to impart a vertical reciprocating motion to the rod 10, carrying the cross-head 11 and its attachment. On the downward movement of the cross-head the pawl 46 engages the ratchet 47 of the shaft 13, which is thereby rotated in the direction indicated by the arrow in the several figures of the drawings. A supply of buttons is placed in the hopper 25, said buttons being of the ordinary kind, provided with eyes that are formed usually of steel wire, said eye being the only metallic portion of the buttons. Such being the case, the buttons will be attracted by the horseshoe-magnets attached to the feeding-wheel, and the eyes of the buttons will naturally be found to adjust themselves between the arms of the said horseshoe-magnets. The slot 26 in the bottom of the hopper is contracted toward its discharge end, so that the shanks or eyes of the buttons, as the wheel revolves, shall be turned to such a position that they will readily enter the narrow slot 28 in the feeding-tube 27. Through the upper portion of the said tube the buttons are successively carried by

the impulse of the magnets, to which they remain attached until the feeding-tube 27 diverges from the rotary wheel 14. At the point where the feed-tube 27 diverges from the feed-wheel the buttons will be automatically detached from the magnets, and they now drop by gravity into the lower and discharge end of the feeding-tube. It will be seen that the feeding-wheel is operated by each operation of the plunger and caused to rotate one or a number of times, according to the force with which the plunger is caused to descend. It is not expected that each magnet will deposit a button in the feed-tube at each operation; nor, indeed, is this necessary. At the same time it is entirely immaterial if a button should be so deposited by each magnet, for the reason that the operation of the machine will be in no wise affected by the number of buttons contained in the feeding-tube. When the latter is completely filled, the result will simply be that any buttons which may adhere to the magnets will be brushed off from the latter when the discharge end of the hopper is reached. The wire-feeding device, which is attached to the shaft 13 and geared from said shaft to the shaft 17, serves to feed the wire which passes from the spool 20 between the rollers 15 and 18, and from thence through the groove 35 in the cutter 34 into the vertical opening 32 in the bench of the machine. The wire, it will be observed, is fed by friction by the rollers 15 and 18, and the latter will slip loosely upon the wire when the end of the latter abuts against the front wall of the recess or opening 32. By this mechanism it will be seen that the wire is fed rapidly and positively whenever required, and that at the same time, whenever a sufficient length of the wire has been fed, the feed automatically ceases. This is partly due to the wire-guide in the cutter 34, which extends in a rearward direction to within a short distance of the discharge end of the feeding-rollers, and which prevents any kinks from forming upon the wire. When in operation the plunger is moved in a downward direction, the sliding plunger will first enter the opening 32, and the sharp rear edge of the movable plunger 53 will engage the front edge of the cutter 34 and sever the portion of the wire which extends through the opening 32 and abuts against the front wall of the said opening. The severed portion of the wire will be found to extend through the eye of the lowermost button in the feeding-tube, the eye of which button is in alignment with the discharge end of the wire-guide in the cutter 34. The lower edge of said eye rests in the notch 41 at the outer end of the arm 40, which extends transversely through the opening 32, and which serves to support the severed portion of the wire from which the staple is to be formed. The groove 55 in the under side of the plunger 53 will now engage the ends of the severed portion of the wire and force them downwardly on opposite sides of the arm 40, thus shaping the

staple, the ends of the wire being accommodated in the grooves 57 in the front and rear walls of the recess 56 in the under side of the plunger. As the plunger descends, the bent portion 69 of the arm 31 bears against the side of said plunger, thus preventing the arm 40 from being thrown out of its approximately horizontal position while the staple is being formed. When the staple has been formed, the bent portion 69 of arm 31 is engaged by the cam or projection 68 and forced laterally through the recess 66 and over the shoulder 67 of the plunger, thus permitting the arm 40 to descend and be thrown out of the way under the pressure of said plunger. During the time occupied by the preceding operations the plunger 53 has been retained in a lowered position upon the stem 50 by the arm 61 engaging the block or projection 62 extending laterally from the plunger 48. The cam 63 of the arm 61 now engages the cam 64 upon the bench 29, thereby throwing the arm 61 out of engagement with the projection 62 and permitting the stem 50 to descend within the plunger 53. The notch or recess 51 at the lower end of said stem will thus engage and press against the upper end of the staple, the arms of which will thus be driven through the material to which the button is to be attached, and which is rested in the proper position upon the face of the anvil. The arms of the staple, having been forced through the material, will engage the recess 45 in the face of the anvil, whereby they will be turned inwardly toward each other and clinched by the continued downward pressure of the plunger. When the plunger recedes in an upward direction, the spring 70 serves to restore the shaft 30, with its attachments, to its original position, and the arm 61 is likewise, by the action of the spring 65, restored to engagement with the block or projection 62, and the plunger, as soon as raised, will thus be ready for a repetition of the operation. Owing to the diagonal rear wall of the opening 32 and the corresponding diagonal shape of the rear side of the plunger 53, the ends of the wire forming the staples will be cut off diagonally, and thus be provided with pointed ends, which will easily penetrate the material to which the buttons are to be attached.

The advantages of my improved machine for attaching buttons will be readily appreciated by those familiar with this class of machines.

The construction is simple and of such a nature as not to be liable to get out of order, and the operation of forming the staples and attaching the buttons will be performed with neatness, accuracy, and dispatch.

I have in the foregoing described what I consider to be the preferable construction of my machine for attaching buttons; but I would have it understood that I do not propose to limit myself to the precise construction of the device in its details which has been herein described, but reserve the right

to make any alterations or modifications which may be resorted to without departing from the spirit of my invention.

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

1. In a machine for attaching buttons, the combination of a hopper having a longitudinally-slotted bottom, a rotary wheel or disk the rim of which extends through said slot and is provided with a laterally-extending flange having a series of notches, a series of horseshoe-magnets attached to one of the sides or faces of said disk and having their arms extended through the notches in the flange of said disk and even with its periphery, and a feed-tube suitably connected to said hopper, substantially as set forth.

2. The combination of a hopper, a spirally-slotted feeding-tube, mechanism for conveying the buttons from said hopper into the feeding-tube, and mechanism operated by the shaft of the feed-wheel for feeding the wire through the eye of the button at the discharge end of the feed-tube, substantially as set forth.

3. The combination of a hopper, a feeding-tube having a longitudinal slot, a rotary feed-wheel extending through a slot in the bottom of the hopper and having a series of magnets to convey the buttons from the latter into the feed-tube, a wire feed-roller mounted upon the shaft of the feed-wheel, a shaft arranged parallel to the shaft of the feed-wheel and having a second feed-roller, pinions mounted upon the said shafts and meshing with each other, and operating mechanism, substantially as set forth.

4. The combination of a hopper having longitudinally-slotted bottom, a feed-tube having a spiral slot, a feed-wheel extending through the slot in the bottom of the hopper and having a series of magnets to convey the buttons contained in said hopper into the feed-tube, and mechanism for feeding the wire to the staple-forming mechanism and threading it through the eye of the button contained in the discharge end of the feeding-tube, substantially as set forth.

5. The combination, with a feed-wheel mounted upon a shaft hung loosely in its bearings, having a series of magnets to convey the buttons contained in the hopper into a suitably-arranged feed-tube, of a vertically-reciprocating rod or plunger having a pawl adapted to engage a ratchet-wheel mounted upon the shaft of said feed-wheel, whereby by the descent of the plunger a continuous and unchecked rotary motion shall be imparted to the feed-wheel, substantially as and for the purpose set forth.

6. In a machine for attaching buttons, the combination of a slotted feed-tube to hold the buttons, mechanism for threading wire through the eye of the button in the discharge end of said tube, a vertically-reciprocating plunger adapted to sever the wire and

to form it into a staple, an oscillating shaft having a radially-extending arm forming a mandrel for the staple, and a stem having a vertical sliding movement with relation to the plunger and adapted to drive and clinch the staple, substantially as set forth.

7. In a machine for attaching buttons, the combination of a slotted feed-tube to hold the buttons, mechanism for threading the wire in the button in the discharge end of said tube, a vertically-reciprocating plunger adapted to sever the wire and to form it into a staple, a rock-shaft having a radial extending arm forming a mandrel for the staple, a bent arm adapted to bear against the side of the plunger while the latter is forming the staple, and a stem having a vertical sliding movement with relation to the plunger and adapted to drive and clinch the staple, substantially as set forth.

8. The combination of a vertically-reciprocating plunger adapted to sever the wire and to form the staple, a rock-shaft having a radial extending arm forming the mandrel for the staple and a bent arm adapted to bear against the side of the plunger while the staple is being formed, a shoulder at the upper end of said plunger to admit of the passage of said bent arm after the formation of the staple, a stem having a vertically-sliding movement with relation to said plunger and adapted to drive and clinch the staple, and an arm or projection extending laterally from said stem and adapted to engage the bent arm of the rock-shaft and to guide it over the shoulder of the plunger, substantially as set forth.

9. The combination of the bench having a vertical opening, the wire-feeding mechanism, the rock-shaft having radial extending arm or mandrel and the bent arm, as herein described, the vertically-reciprocating stem, the plunger having a vertically-sliding movement with relation to said stem, an arm hinged to said plunger and adapted to bear against the projection extending laterally from said stem, and mechanism for releasing or disengaging said arm on the downward movement of the plunger, which is thereby disconnected from the stem, substantially as set forth.

10. The combination, with wire-feeding and button-feeding mechanism, of the bench having a vertical opening, the rock-shaft journaled longitudinally in said bench and having a radially-extending arm or mandrel, the longitudinally-grooved cutter extending through the rear wall of the bench, and the vertically-reciprocating plunger adapted to sever the wire, substantially as set forth.

11. The combination, with wire-feeding and button-feeding mechanism, of the bench having the vertical opening, the longitudinally-slotted feed-tube, the rock-shaft having the radially-extending arm or mandrel, the longitudinally-grooved cutter and wire-guide extending through the rear wall of the bench,

the vertically-reciprocating plunger adapted to sever the wire and to form the staple, a bent arm attached to the rock-shaft carrying the mandrel and adapted to bear against the side of the plunger while the latter descends, and mechanism for feeding the wire, substantially as set forth.

12. The combination, with wire-feeding and button-feeding mechanism, of the bench having the vertical opening, the longitudinally-slotted feed-tube attached to the same, the rock-shaft having the radially-extending mandrel and a bent arm, the longitudinally-grooved cutter and wire-guide extending through the rear wall of the bench, the vertically-reciprocating plunger adapted to sever the wire and form the staple, a shoulder at the upper end of said plunger to admit of the passage of the bent arm of the rock-shaft, a stem having a vertically-sliding movement with relation to the plunger and adapted to drive and clinch the staple, and the wire-feeding mechanism, substantially as set forth.

13. The combination, with wire-feeding and button-feeding mechanism, of the bench, the rock-shaft mounted in the same and having an arm or mandrel extending transversely through the vertical opening in said bench, the vertically-reciprocating stem, and the plunger mounted to slide vertically upon said stem and provided in its under side with a longitudinal groove, and a transverse recess having an upwardly-extending notch, the front and rear walls of said recess being grooved vertically, substantially as set forth.

14. In a button-setting machine, the combination of the bench having a vertical opening, the spirally-slotted feed-tube attached to the same, the rock-shaft mounted longitudinally in said bench and having the radially-extending arm or mandrel, the longitudinally-grooved cutter and wire-guide extending through the rear wall of the bench, the vertically-reciprocating stem, the plunger mounted to slide vertically upon said stem, a bent arm extending from the rock-shaft, carrying the mandrel, and adapted to bear against the side of said plunger while the latter continues its downward movement, a cam or projection attached to the stem and adapted to engage the said bent arm and to guide it through a recess in the front side of the plunger when the latter reaches the downward limit of its stroke, and mechanism for disengaging the stem from the plunger to enable the latter to continue its downward movement within said plunger, substantially as set forth.

15. The combination, with wire-feeding and cutting mechanism and button-feeding mechanism, of the bench, the rock-shaft having the radially-extending arm or mandrel and an upwardly-extending bent arm, the vertically-reciprocating plunger adapted to form and set the staple and to force the mandrel in a downward direction after the formation of the staple, and a spring adapted to restore the rock-shaft and its arms to their

normal position when the plunger recedes in an upward direction, substantially as set forth.

16. The combination, with wire feeding and cutting mechanism and button-feeding mechanism, of the bench having the vertical opening, the spirally-slotted feed-tube attached to the same, the rock-shaft, the arm or mandrel extending laterally from the same and having vertically notched or slotted outer end, and the vertically-reciprocating plunger adapted to form and set the staple over the said mandrel, substantially as set forth.

17. The combination, with the button-feeding mechanism, of the bench having the vertical opening and provided with a horizontal perforation in its diagonal rear wall, the longitudinally-grooved cutter and wire-guide mounted in the said perforation and having a diagonal face, a set-screw to retain the said cutter detachably in position, mechanism for feeding the wire, and the vertically-reciprocating staple forming and setting plunger, substantially as and for the purpose set forth.

18. The combination of the bench, the vertically-reciprocating stem having a laterally-extending projection, the plunger mounted to slide vertically upon said stem, an arm hinged to the said plunger and adapted to bear against the under side of said projection, a cam extending laterally from said arm, a cam mounted upon the bench and adapted to engage the cam of said arm and throw the latter out of engagement with the projection upon the vertically-sliding stem, and a spring to restore the said arm to its normal position, substantially as herein set forth.

19. The combination, with wire feeding and cutting and button-feeding mechanism, of the bench having the vertical opening, the anvil arranged below the said bench and having the longitudinally-notched face, the spirally-slotted feed-tube attached to the bench, the rock-shaft having the laterally-extending mandrel, the longitudinally-grooved cutter and wire-guide, and the vertically-reciprocating plunger adapted to form the staple and mounted to slide upon a stem adapted to drive and to clinch the staple, substantially as set forth.

20. In a machine for attaching buttons, the combination of the bench having the vertical opening, the anvil arranged below said bench and having longitudinally-notched face, the

slotted feed-tube attached to the bench, a hopper connected with said feed-tube, a rotary disk having a series of magnets adapted to convey the buttons from said hopper into the feed-tube, a vertically-reciprocating rod having a cross-head at its upper end, a pawl attached to one end of said cross-head and adapted to actuate the feed-wheel and a set of wire-feeding rollers, a rock-shaft mounted longitudinally in the bench and having a radially-extending arm or mandrel, and a stem attached to the opposite end of the cross-head of the vertically-reciprocating rod and provided with a vertically-sliding plunger adapted to sever the wire and to form a staple, said stem being adapted to drive and to clinch the staple, substantially as set forth.

21. In a machine for attaching buttons, the combination of a hopper, a slotted feed-tube, a rotary disk having a series of magnets to convey the buttons from said hopper into said tube, wire-feeding mechanism for threading the wire through the eye of the last button in the tube, a spring to retain the contents of the feed-tube in position, a vertically-reciprocating rod having a cross-head at its upper end, a pawl attached to one end of said cross-head and adapted to actuate the feed-wheel and the wire-feeding mechanism, a bench provided with a vertical opening and having the discharge end of the feed-tube attached thereto, a shaft mounted longitudinally in said bench and having a radially-extending arm or mandrel, an anvil arranged below said bench, a stem attached to the end of the cross-head opposite to the pawl, a plunger mounted upon said stem and sliding longitudinally thereon, said plunger being adapted to sever the wire and to form a staple, the longitudinally-grooved cutter and wire-guide extending through the rear wall of the bench, and a bent arm extending from the shaft carrying the arm or mandrel and adapted to bear against the side of the plunger while the latter continues its downward movement, all arranged and operating substantially as and for the purpose set forth.

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

CLYDE J. COLEMAN.

Witnesses:

F. W. HASKELL,
CHAS. E. YOUNT.