

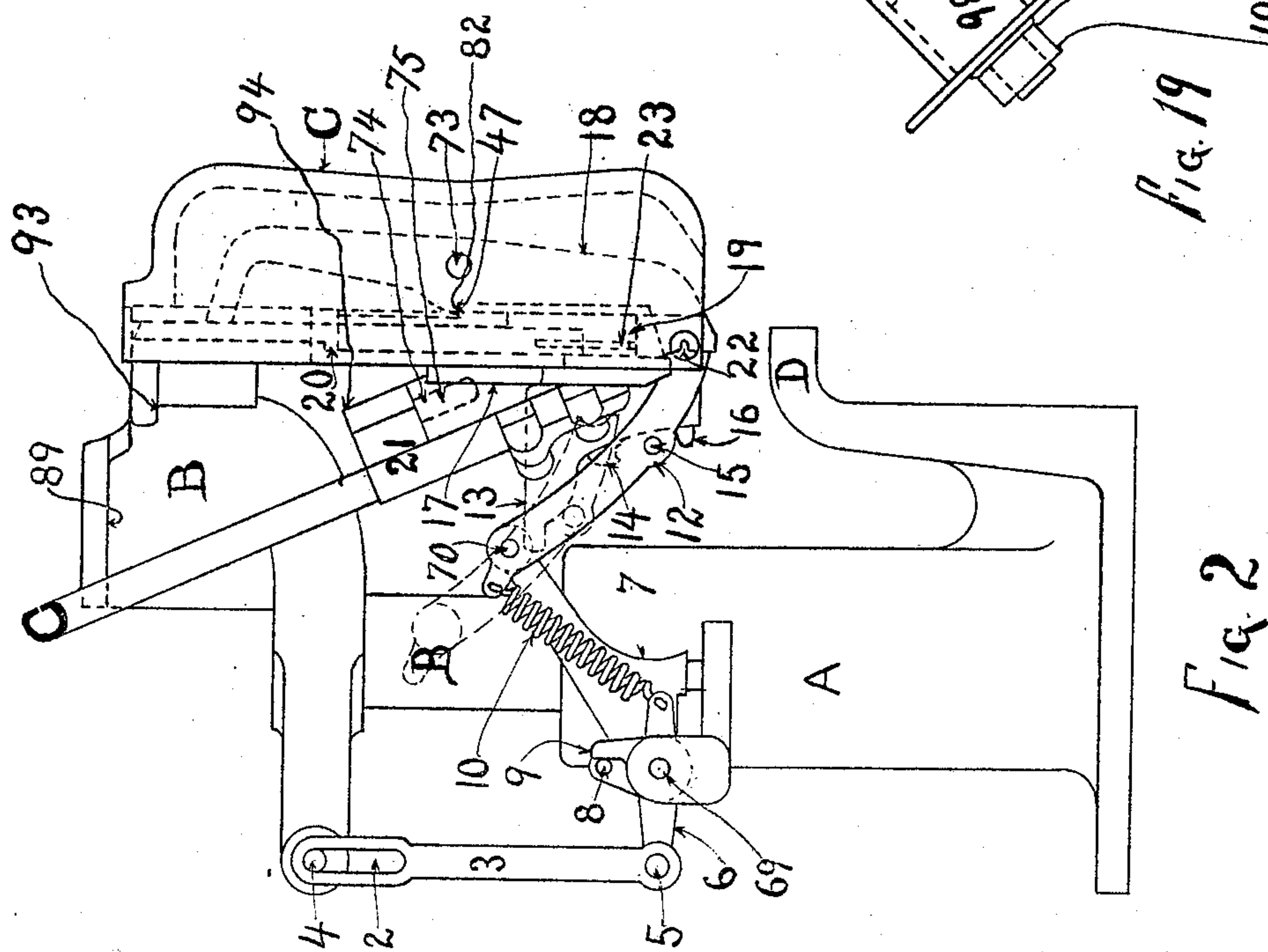
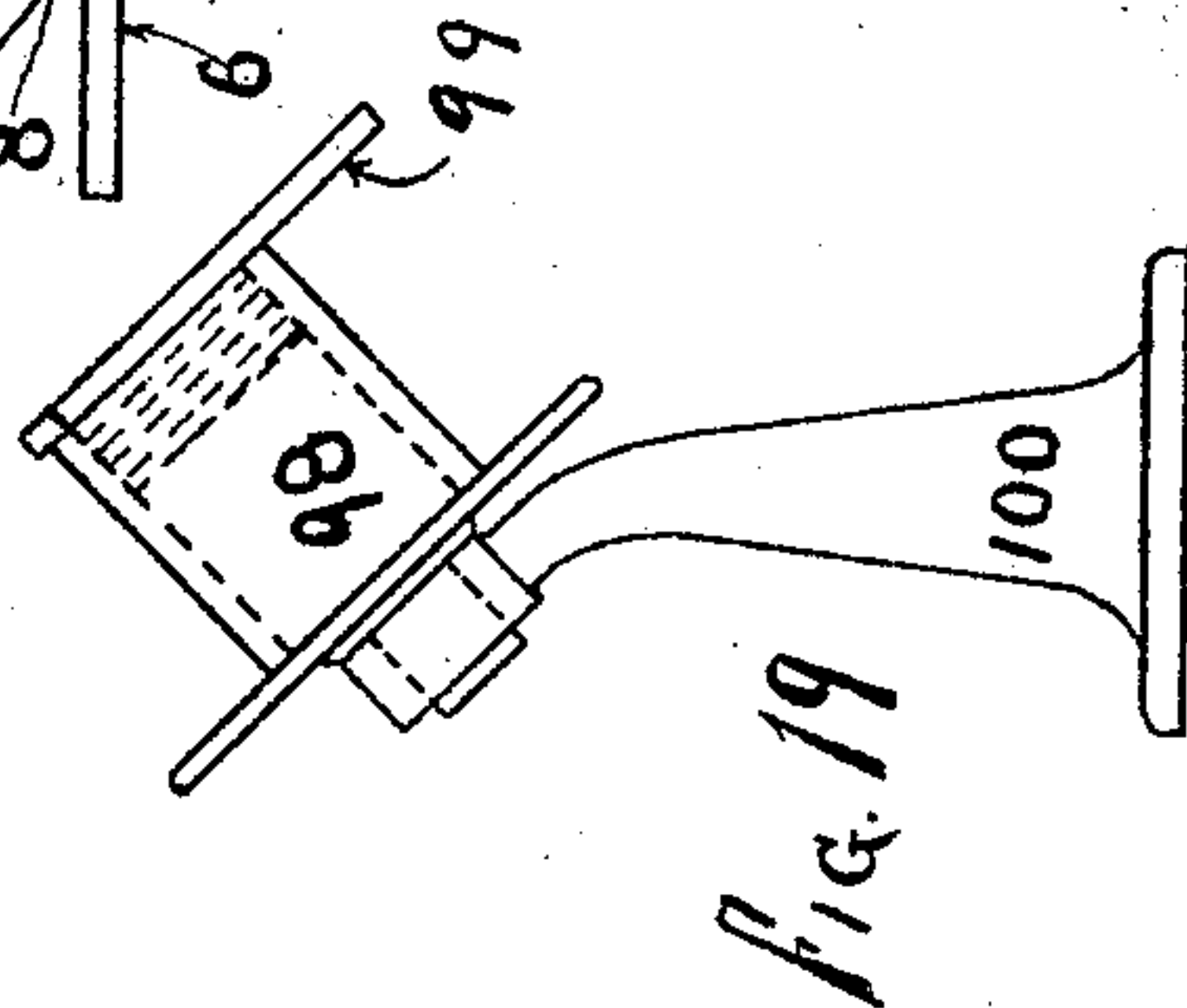
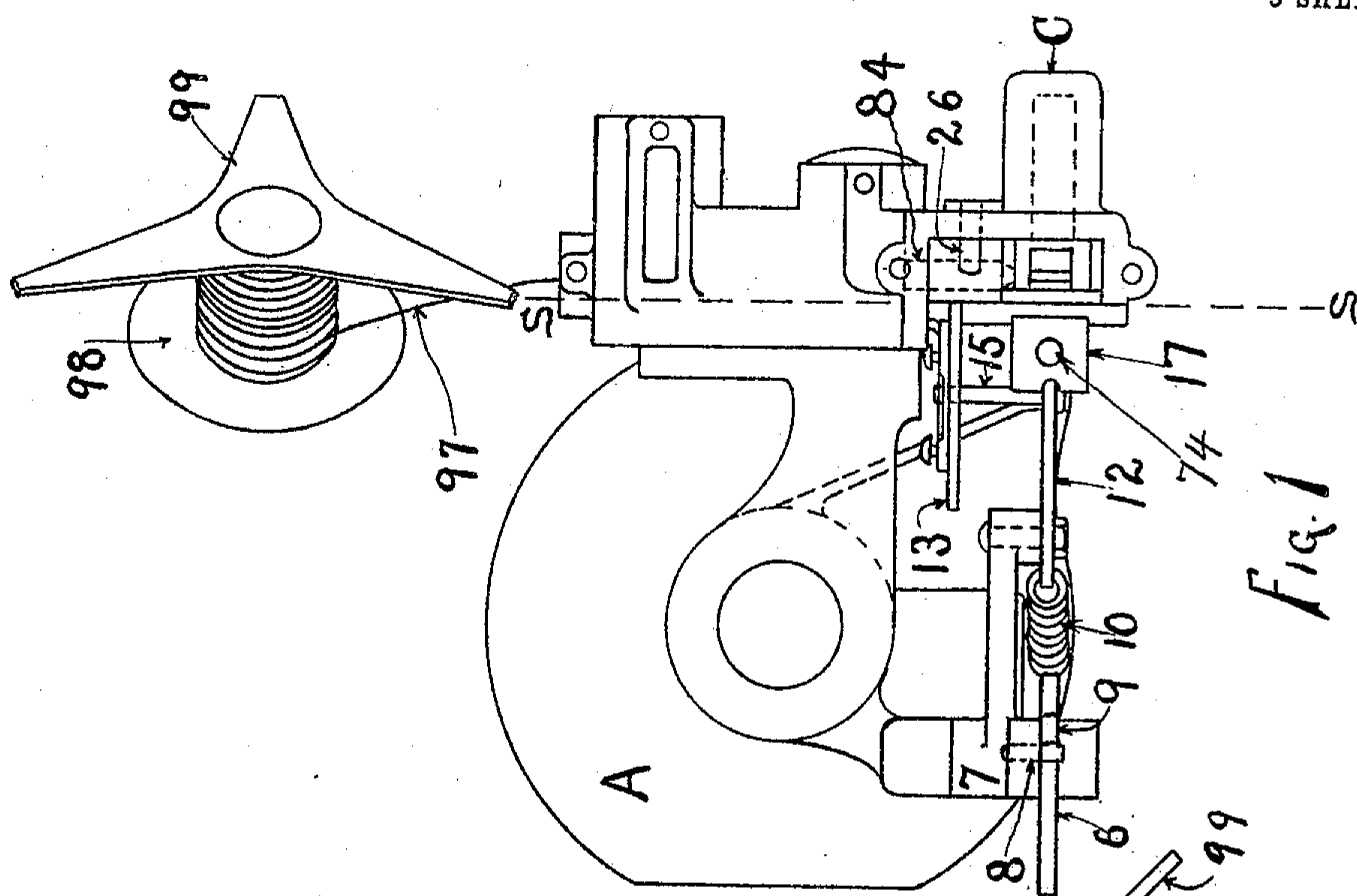
No. 799,549.

PATENTED SEPT. 12, 1905.

W. E. ELLIOTT.
BUTTON SETTING MACHINE.

APPLICATION FILED SEPT. 19, 1896. RENEWED APR. 5, 1902.

5 SHEETS—SHEET 1.



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Fig. 3.

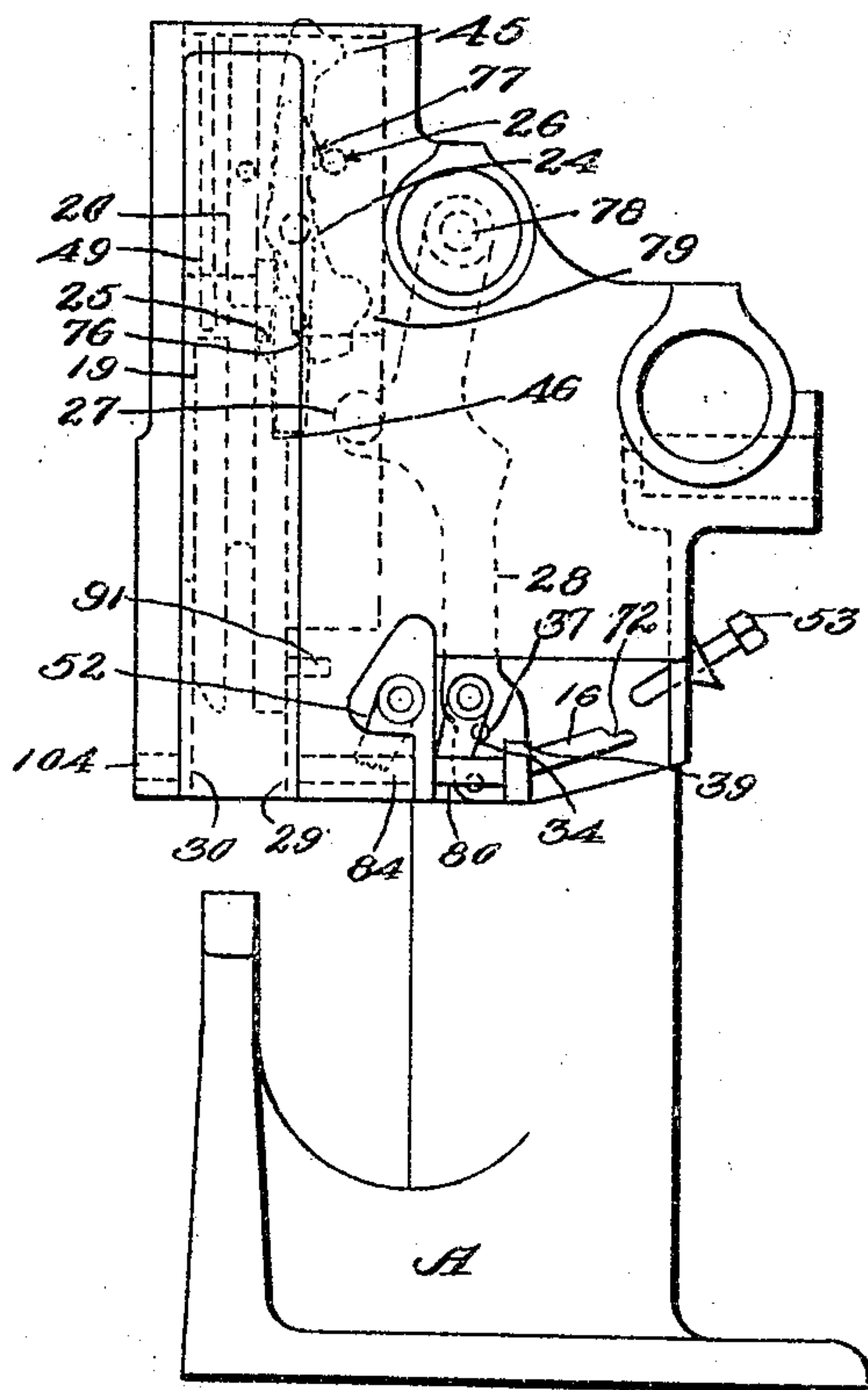


Fig. 15.

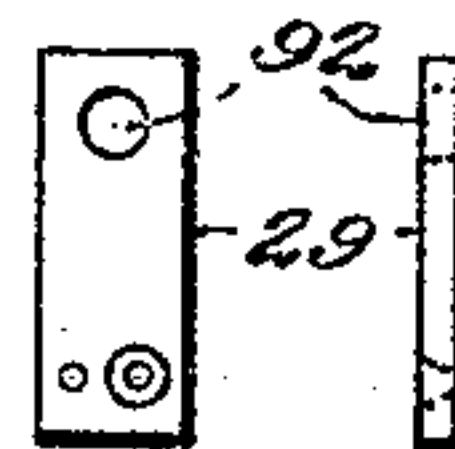
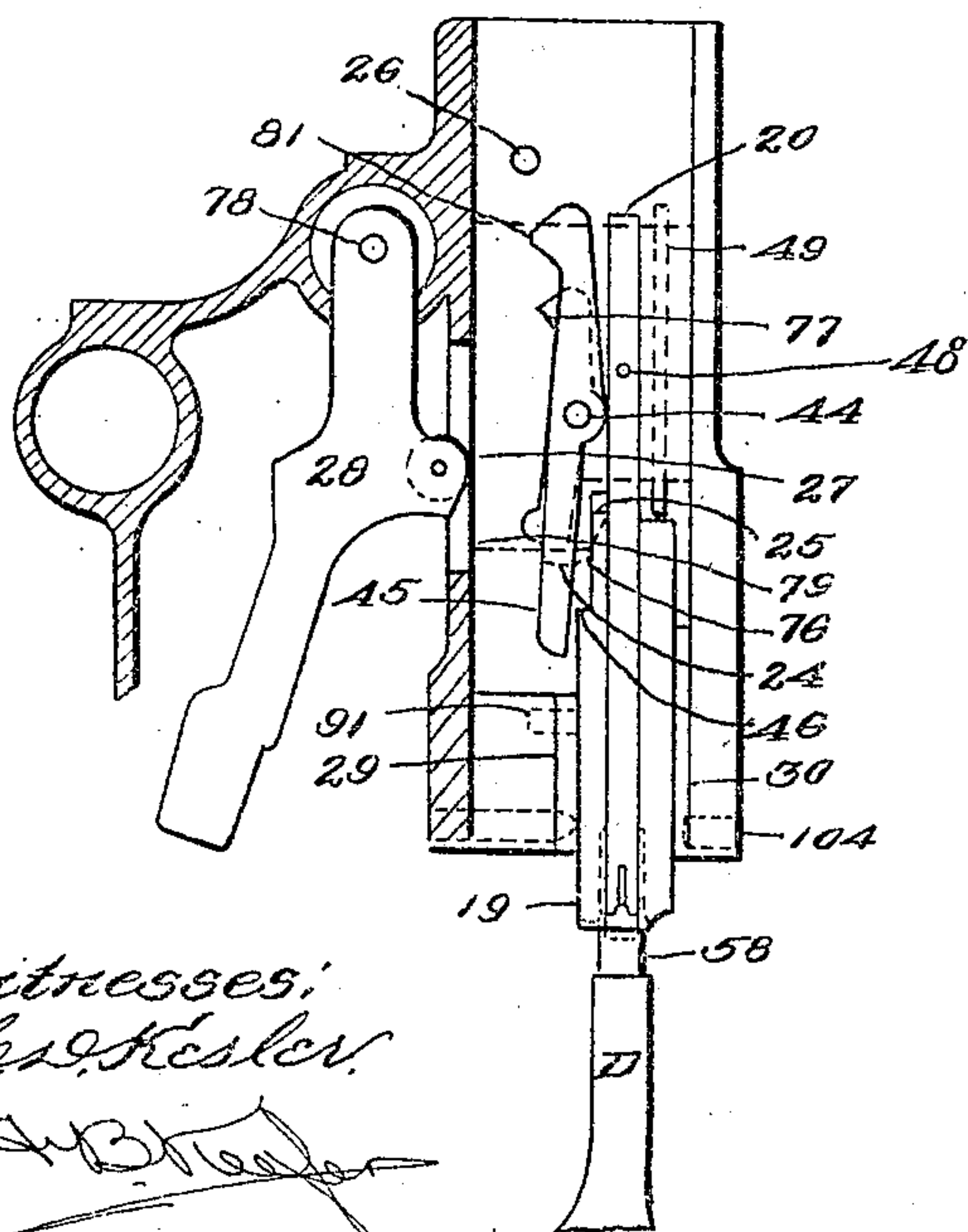
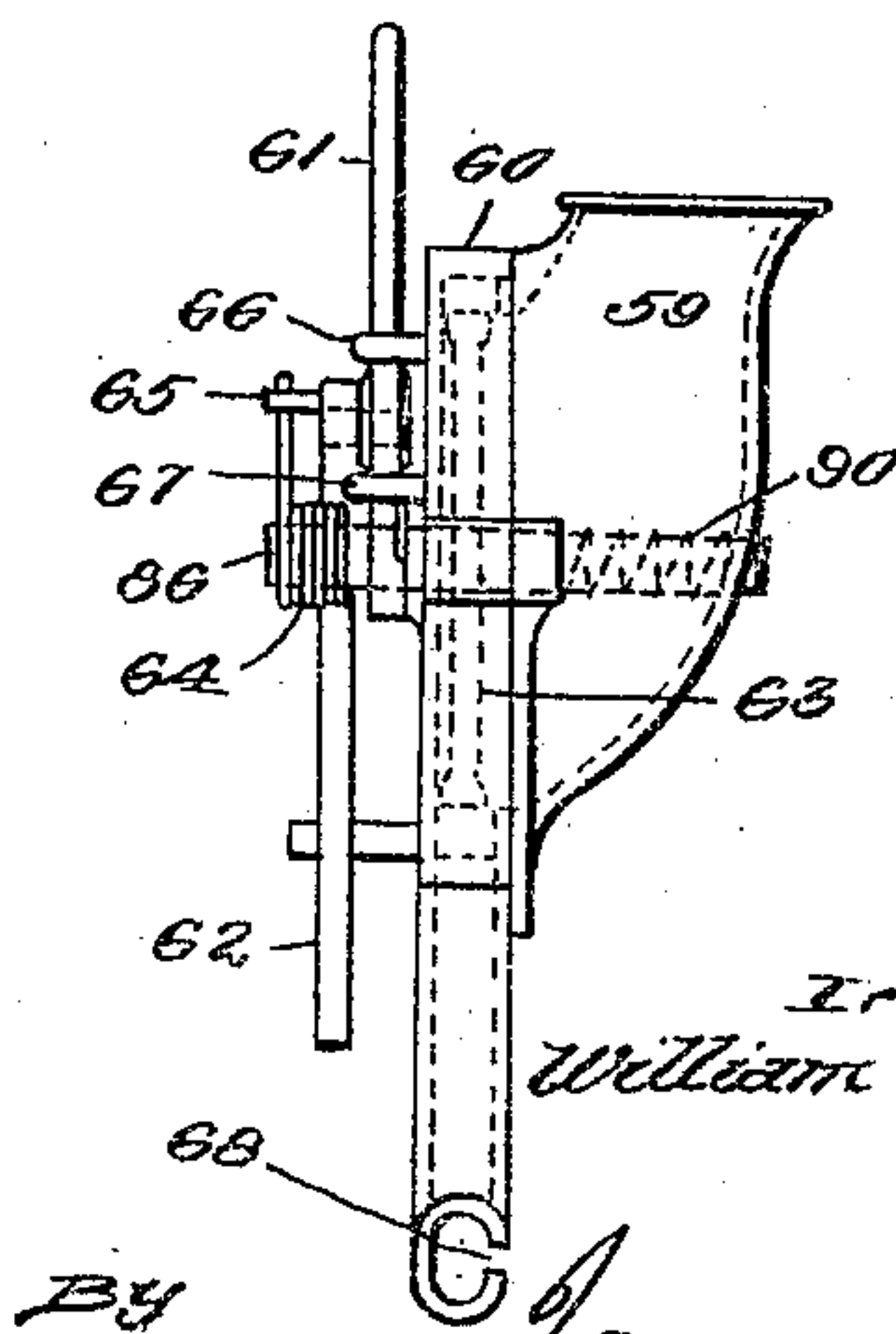


Fig. 13.



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Fig. 14.



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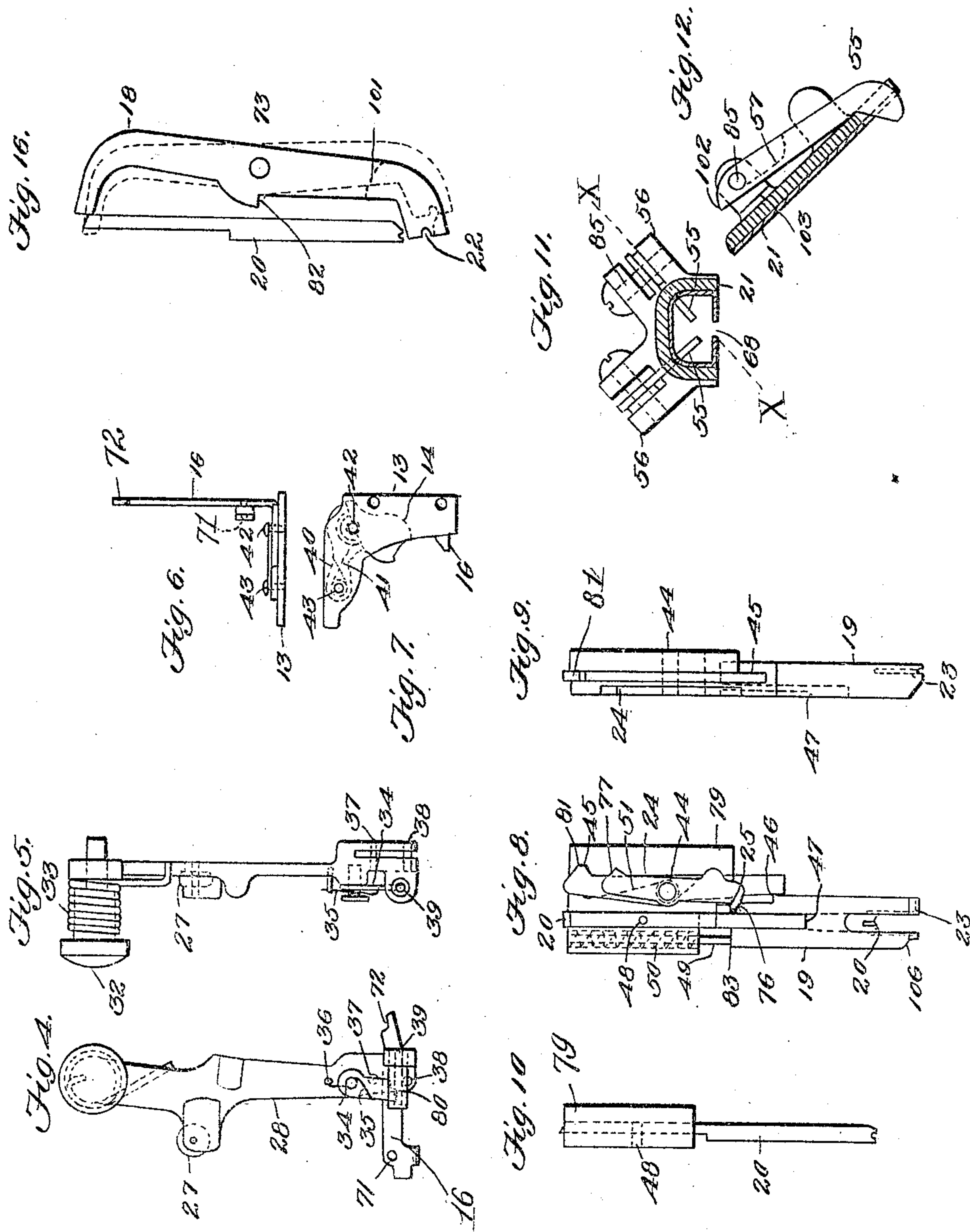
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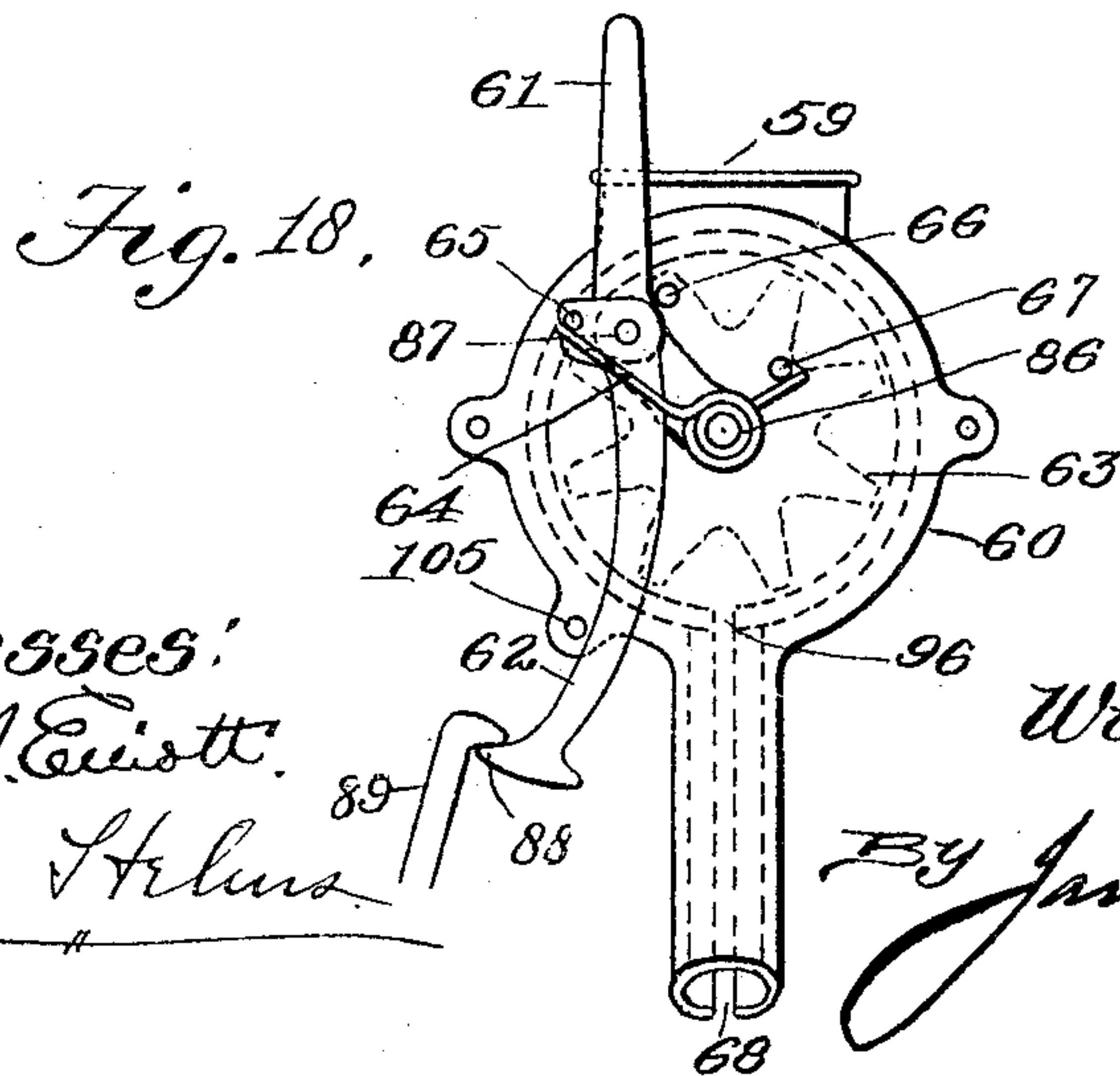
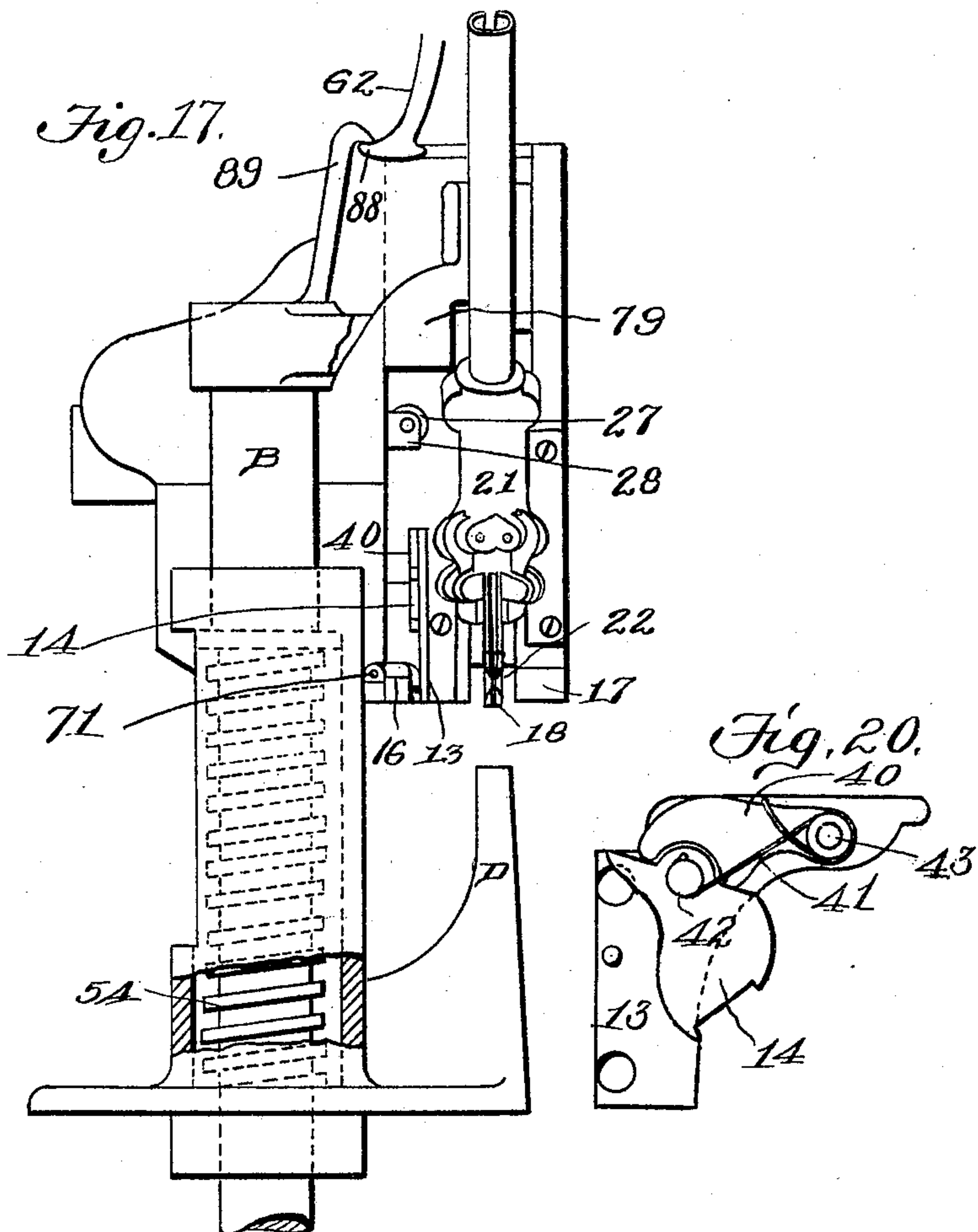
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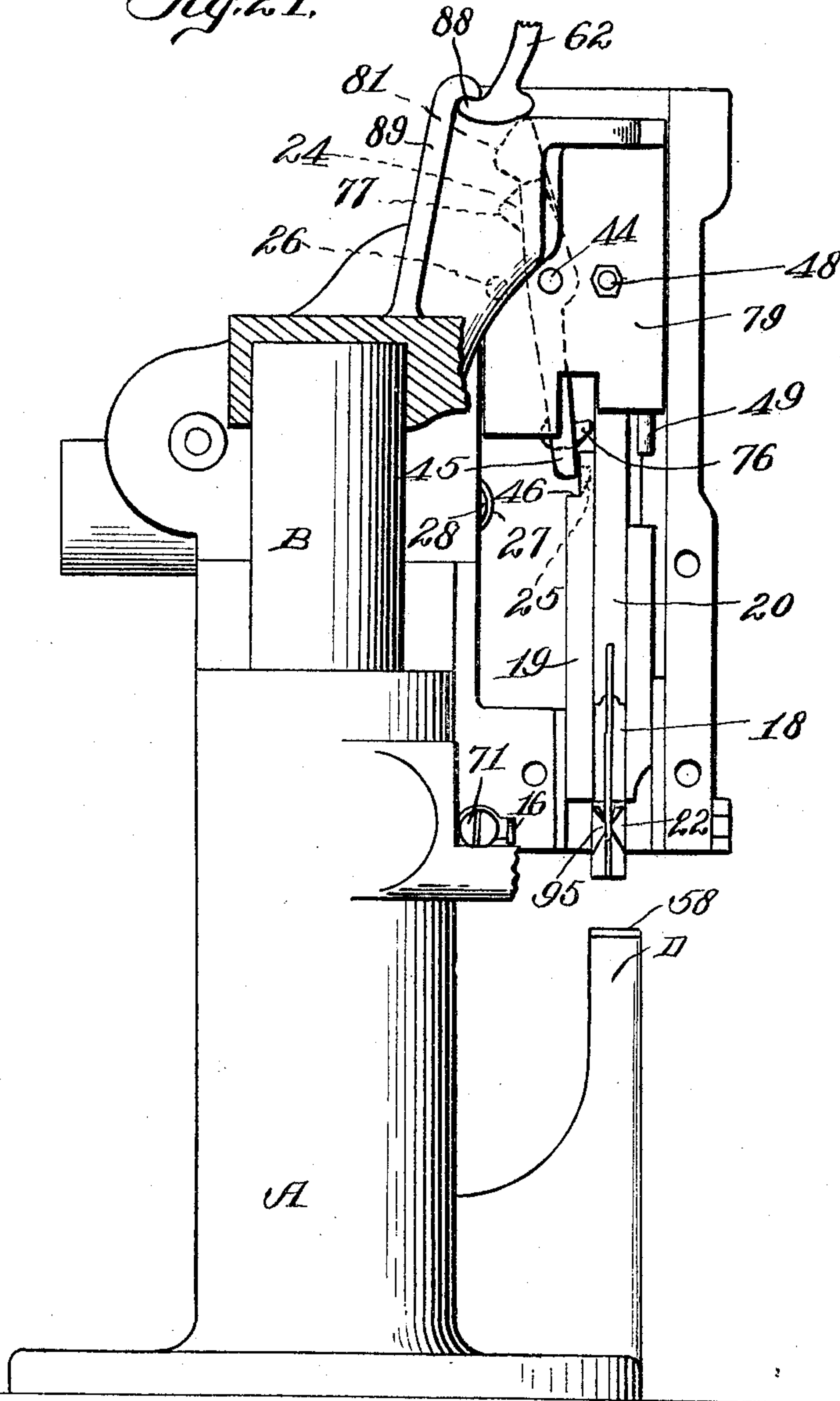
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APPLICATION FILED SEPT. 19, 1896. RENEWED APR. 5, 1902.

5 SHEETS—SHEET 5.

Fig. 21.



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UNITED STATES PATENT OFFICE.

WILLIAM E. ELLIOTT, OF GRAND RAPIDS, MICHIGAN.

BUTTON-SETTING MACHINE.

No. 799,549.

Specification of Letters Patent.

Patented Sept. 12, 1905.

Application filed September 19, 1896. Renewed April 5, 1902. Serial No. 101,576.

To all whom it may concern:

Be it known that I, WILLIAM E. ELLIOTT, a citizen of the United States, residing at the city of Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Button-Setting Machines, of which the following is a specification.

This invention relates to certain new and useful improvements in that class of button-setting machines which are operated by foot or other power and in which the buttons are fed from a hopper or chute to the clenching anvil or die after receiving the staple through the eye of the button, and is more especially adapted to that class of button-setting machines in which the wire is taken from a spool or other suitable holder, a section thereof severed after the same has been fed through the eye of the button, and a staple formed out of the section, which is driven by the action of the machine so that the button is attached, by means of the staple, to the fabric; and it consists of the novel combination and arrangement of parts hereinafter more specifically described, illustrated in the accompanying drawings, and particularly pointed out in the claims hereunto appended, and in describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, wherein like characters of reference indicate corresponding parts throughout the several views, and in which—

Figure 1 is a plan view of a button-setting machine constructed in accordance with my invention with the wire-feeding mechanism and hopper removed in order to show the general form of the machine and the arrangement and position of the feed-finger with reference to the mechanism which operates the same. Fig. 2 is a side elevation showing the button-feed tube in position and also showing in dotted lines the staple bender and former and in solid lines the mechanism for operating the feed-finger, the feed-finger being shown in position to retain the button at a point where it may receive the staple-driver. Fig. 3 is a front elevation showing in dotted lines the wire-feeding mechanism, as well as the mechanism for operating the staple-bender. Fig. 4 is a side elevation of the wire-feeding lever and adjunctive mechanism. Fig. 5 is an edge view of the wire-feeding lever

and parts illustrated in Fig. 4. Figs. 6 and 7 are detailed views of the raceway and guard, the pivoted lever 16 being shown associated therewith, Fig. 6 showing an edge view, and Fig. 7 a flat view. Fig. 8 is a detached view of the lock-bars, staple-bender, staple-driver, leather-tension, and front end of the plunger, all in position as used in the machine. Fig. 9 is a side elevation of the parts shown in Fig. 8. Fig. 10 is a side view of the staple-driver and a portion of the plunger to which the staple-driver is attached. Fig. 11 is an end view of the lower end of the button-chute, showing the position of the button-retaining hooks, together with the slot in the chute through which the button-eye shank projects. Fig. 12 is a side view of one of the button-retaining hooks and a longitudinal sectional view of the chute or button-tube. Fig. 13 is a cross-section on line S S of Fig. 1. Fig. 14 is a side elevation of the button-hopper and mechanism which operates the same, the dotted lines showing the position of the button-agitator within the hopper. Fig. 15 is a flat and edge view of the cutting-off plate 29, the plate being provided with two holes, said holes forming a shearing edge, also showing pin attachments. Fig. 16 is a side view of the staple-former and staple-driver, the solid lines showing one position and the dotted lines showing the extreme other position of the staple-former. Fig. 17 is a view in elevation, partly broken away, showing the side of the machine opposite to that shown by Fig. 3 and showing also the lower part of the button-feed tube and the connection between the plunger and the hopper. Fig. 18 is a front elevation of a button-hopper with dotted lines showing the button-agitator and the projection connecting the same to the plunger. Fig. 19 is a detail view showing the support for the disk carrying the coil of wire. Fig. 20 is a detail view, on an enlarged scale, showing the reverse side of the raceway-guard 13 to that shown in Fig. 7 and illustrating the construction and arrangement of the levers 14 and 40. Fig. 21 is a view similar to Fig. 17, the button-tube and the face-plate carrying the supporting means therefor and having the raceway-guard formed as an integral part thereof being removed to show the parts carried by the part 79 of the plunger, of which parts the lock-levers 24 and 45 are indicated in part by dotted lines.

Similar letters and figures refer to similar parts throughout the several views.

A represents the frame or main casting of the machine.

5 B represents the plunger, which carries the driver and lock-bars (shown in Fig. 8) and is connected, as at 4, (see Fig. 2,) to operate the button-feeding mechanism. The plunger is caused to have a reciprocating motion by
10 means of foot-power or any other suitable means, and the moving parts of the staple former and bender of the button-setting device all receive their motion directly or indirectly from the movement of the plunger.

15 C represents that part of the frame or main casting which incloses the staple-former 18, Figs. 1 and 2.

D represents a support for the anvil or die which clenches the staples.

20 2 is a slot in the connecting-rod 3. The rod 3 connects the plunger B with the lever 6.

4 is a pin or stud passing through the slot 2 and forming a connection between the rod 3 and the plunger B, Fig. 2.

25 5 is a connecting pin or bolt connecting the rod 3 to the lever 6. Lever 6 turns upon the central bolt 69 and is connected at one end to the rod 3 and at the other end to the connecting-spring 10.

30 7 is the button-feed-finger arm turning on the same fulcrum or pivot as lever 6, Figs. 1 and 2, and supports the feed-finger 12 by a bolt or pivot 70.

35 8 is a stop-pin or abutting surface rigid with the feed-finger arm 7, which serves when the lever 6 reaches this point to transmit motion to said arm or lever 7.

40 9 is a shoulder or abutting surface rigid with the lever 6, which meets or engages with the stop 8, which imparts motion to the feed-finger arm.

45 10 is a spring connection between lever 6 and feed-finger 12. I have shown in the drawings a form using a coiled spring directly connecting the two.

12 is the feed-finger pivoted to the feed-finger arm by the bolt or pivot 70.

50 13 is the raceway-guard, on which the feed-finger pin 15 slides or moves in order to keep the feed-finger from scraping upon the raceway. The pin 15 is rigid with the feed-finger and slides on the raceway-guard 13, and at the back stroke of the finger the latter is lifted over the button, so that its downward
55 movement will carry the button to position for receiving the staple-wire. It is carried over by means of the cam-lever 14, as shown in Figs. 2 and 7.

60 16 is a pivoted lever which forms a stop for the pin 15 when there is no button in the feed-finger—that is, when there is no button in the feed-finger the latter comes in contact with the lever 16, which disconnects the wire-feed-

ing jaws, so that the wire is not fed to the staple-making machine unless there is a but- 65 ton in position to receive the wire adapted to be fed through its eye. The lever 16 is pivoted at 71 to the frame. The contact of the feed-finger lifts the longer end of the lever 16, and the notch 72 on lever 16 engages with 70 the pin 37 in the wire-feeding lever, thereby stopping the action of the wire-feed, Figs. 2 and 4. When the feed-finger is resting upon a button during the feeding of the same, it will thereby be held from pressing inward a suf- 75 ficient extent to permit its pin 15 to come in contact with the pivoted lever 16.

17 is a feed-tube holder or support which may consist of a projection formed on the main frame and provided with an opening to 80 receive a projection on the button-feed tube.

18 is a staple-former, (shown by dotted lines in Fig. 2,) which staple-former turns or oscillates upon the bolt 73. The same is operated by the reciprocating motion of the sta- 85 ple-driver, the latter moving with the plunger B. The upward stroke of the staple-driver, which is shown by 20, moves the upper end of the staple-former outwardly, and consequently moves the lower end into position to 90 receive the wire as the same is pressed down upon it by the staple-bending device after it has been severed from the coil, the button resting upon the staple-former and receiving the wire through its eye before said wire is 95 severed. When the staple-bender 19 descends, it severs the wire and bends the part severed into the shape of the staple-former. The continued downward movement of the staple-bender and staple-driver releases the upper 100 end of the staple-former and removes the lower end from the path of the staple-driver, while the staple-driver, together with the button and staple, continues its downward course until the button is fastened upon the 105 fabric by the clenching of the staple which passes through the same, Fig. 16.

19 is the staple-bending and staple-cutting bar, the same adapted to receive reciprocating vertical motion through the action of the 110 locking-bars 24 and 45, Figs. 2, 3, 8, 9, 13. The outside of the lower end of that side of the staple-bender opposite the wire-cutting side I cut away, as shown by 106 in Fig. 8. It is necessary that the bender should be of 115 full width in its upper part, so as to cut a length of wire proper for the staple; but if the lower surface is of the same width it will interfere with setting the buttons as closely as is sometimes desired, because the bender 120 would crush the last button set. By cutting this away, as shown, I provide clearance-space for the button last set.

20 is the staple-driver, which is attached rigidly to the part 79 of the plunger B by means 125 of the bolt or pin 48. The staple-driver moves

with the plunger at all times. Its general form is shown in Figs. 2, 3, 8, 9, and 13.

21 is a button-feed tube which is attached to the support 17. The feed-tube is preferably provided with a pin or projection 75, which engages with the hole or opening 74 in the support. The feed-tube is so constructed that it may readily be attached and detached. The feed-hopper when in use has a feed-tube extending from the hopper downwardly, and it engages with the support 17 in substantially the same manner as does the feed-tube which is used without a hopper. The method of automatically driving the feed-tube to its seat within the support is described hereinafter.

22 is a groove in the staple-former for the reception of the wire.

23 shows the staple-guiding grooves in the staple-bender 19, Figs. 8 and 9.

24 is a return locking-bar which engages with and lifts the bender 19 at the back or reverse stroke of the machine to a point above where the wire is fed. This locking-bar turns upon a pivot 44, carried by the part 79 of the plunger, and is shown in Figs. 8, 9, and 13.

25 is a notch in the staple-bender with which the hook 76 of the locking-bar 24 engages on the upward stroke of the plunger, thereby lifting the staple-bender above the point where the wire is fed, and when above such point it is disengaged by contact of the cam end 77 with the trip-pin 26, which trip-pin 26 is made rigid with the frame A, Figs. 1, 3, 8, and 13.

27 is a roller attached to the wire-feeding lever 28, which engages with the part 79, as hereinafter described, Figs. 4 and 5.

28 is the wire-feeding lever. It is pivoted at 78 to the frame, upon which pivot it oscillates, and it is operated by the part 79 on the plunger B, the former coming in contact with the roller 27 and in connection with spring 33 imparts a reciprocating motion to the lower end of the feed-lever and its adjunctive mechanism.

29 is a steel plate provided with one or more openings through which the wire is fed. This plate forms the shear edge which cuts off the wire upon the descent of the wire cutting and bending bar, Figs. 3, 13, and 15.

30 is a steel plate on the other side of the bending-bar. The same is held in position by the pin 104, Fig. 13.

32 is a spring-supporting shaft supporting the spring 33, the same being attached to the frame A by the pivot 78, Fig. 13. The wire-feeding lever 28 rocks on this shaft 32, Figs. 4 and 5.

33 is a spring which is preferably coiled around the shaft 32 and operates the wire-feeding lever 28 in its reverse movement, Figs. 3, 5, and 13.

34 is a swinging jaw on the wire-lever 28

and is held in operative position by the spring 35. The wire-carrying tube 80 is slotted to receive the jaw 34, and the latter clasps the wire between itself and the bottom of the tube, thus forming the grip which feeds the wire to the staple cutter and bender, Figs. 3 and 5. Two jaws are employed, one, 34, adapted to feed the wire forward to the staple cut-off and the staple-bender and the other (shown at 52) adapted to retain the wire in position and prevent the same from moving backward, Figs. 3 and 14. The jaw 52 is also held in operative position by a spring similar to the spring 35, which spring, however, is not shown, owing to the nature of the view selected in Fig. 3.

36 is a pin for holding one end of the spring 35 in position, the other end of the spring bearing against and holding the jaw 34 in operative position.

37 is a pin carried by the lever 28, which engages with the notch 72 of the lever 16 on its back stroke, so that whenever for any reason a button is not fed in position upon the staple-former to receive the section of wire to be cut into a staple the wire-feeding mechanism is held out of operative position.

38 is a pin carried by the lever 28 and acting as a support for the lever 16 when the same is not engaged with the pin 37, Fig. 4.

39 is an opening for the wire in lever 28.

40 is a lever pivoted at 43, operated by the spring 41, and is adapted to return the pivoted cam-lever 14 to normal position after it has carried the feed-finger over a button, Figs. 6 and 7.

42 is the pivot on which the cam-lever 14 turns, and 43 is the pivot on which the lever 40 turns.

44 is the pivot carried by the part 79 of the plunger B, on which the lock-levers 24 and 45 turn or oscillate, Figs. 3, 8, and 9.

45 is the lock lever or bar, pivoted at the point 44 and which engages with and depresses the staple-bender 19 in its downward stroke and also releases it by the action of the cam end 81 coming in contact with the trip-pin 26, which release is after the staple is bent into shape over the former, Figs. 8 and 13.

46 is a shoulder or abutting surface on the staple-bender which is engaged by the lower end of the lock-bar on its downward stroke, whereby the staple-bender is carried down by said lock-bar.

47 is a groove in the staple-bender 19, which engages with the projection 82 of the staple-former 18.

48 is a screw connecting the staple-driver to the plunger B.

49 is a spring-pressure bar attached to the plunger B and provided with a spring 50. The bar 49 comes in contact with the shoulder 83 of the staple-bender and after the same

has been released by the lock-bar moves the same down upon the leather and holds the leather or other fabric under spring-pressure, thereby allowing the machine to operate on stock of varying thicknesses, Fig. 8.

50 is a spring which holds the spring-pressure bar 49 under spring-pressure.

51 is a spring which brings the lock-bars 24 and 45 into normal position, Fig. 8.

52 is a wire-feeding jaw which is adapted to retain the wire in position and prevent its backward movement. It is constructed the same as the wire-feeding jaw 34 and operates in connection with the feed-lever 28, Fig. 3.

53 is an adjusting-screw which is adapted to come in contact with jaw 34 upon its backward stroke, holding the jaw and releasing the wire, so that the jaw on its forward movement will take a new hold upon the wire, thereby preventing the machine from cutting off small pieces of wire when the lever 16 holds the wire-lever 28 out of operative position.

54 is a spring which raises the plunger to its normal position after the power which depresses it has been removed.

55 is a button-retaining hook connected to the lower end of the button-tube. It turns upon the pivot 85 and is held in operative position by means of a spring 57, Figs. 1, 11, and 12.

56 represents lugs on the end of the button-tube for holding the button-retaining hooks and their springs.

57 represents springs for operating the button-retaining hooks 55, Figs. 11 and 12.

58 is a clenching-die adapted to turn and clench the legs of the staple into proper shape, Fig. 13.

59 is a button-hopper adapted to receive the buttons and from which they are fed to the button-raceway.

60 shows the hopper-bottom and raceway through which the buttons are fed from the hopper to the raceway or button-feeding tube.

61 is an operating-lever rigidly attached to the shaft 86, which shaft passes through the button-hopper and supports the button-agitator 63.

62 is a connecting hook-arm, which is pivoted to lever 61 at pivot 87. The lower end of the hook 62 is shown by 88, which is adapted to come in contact with the flange 89 of the plunger B.

63 is the button-agitator, supported upon the shaft 86, said agitator being held in operative position by the spring 90, the attachment of the spring to the agitator being only by the spring tension, in order that upon any clogging of the agitator by the buttons or otherwise the spring will slip upon the shaft and the agitator or adjunctive mechanism will not be broken by forced operation.

64 is the spring on the shaft 86, which re-

turns the shaft and the button-agitator to its normal position as soon as the hook 88 is removed from the flange 89.

65 is a pin on the hook-connecting arm 62, removed from the pivotal point of the hook-arm. The spring 64 bears against the pin 65, holding the hook in position to engage with the flange 89, and also serves to return the lever 61 and its adjunctive parts to normal position as soon as the hook is released from the flange when the plunger B is raised, Fig. 18.

66 is a pin on the shoulder of the hopper to limit the upward stroke of the lever 61.

67 is a stop for the spring 64. 105, Fig. 18, is a guide and stop consisting of a pin projecting from the hopper and in contact with the hook-arm 62.

68 is a slot in the button-chute, which is adapted to receive and guide the eye of the button.

69 is a central bolt which supports the levers 6 and 7, Fig. 2.

70 is a pivot attaching the feed-finger 12 to the feed-finger arm 7, Fig. 2.

71 is a pivot attaching the lever 16 to the frame A, Fig. 4.

72 is a notch in the lever 16, which engages the pin 37 and the wire-feeding lever 28, thereby arresting the operation of the wire-feeding device when no button is in position to receive the wire, Fig. 4.

73 is a bolt or pin on which the staple-former 18 oscillates as the plunger is moved upward and downward.

74 is an opening in the button-feed-tube holder 17, which receives the projection from the button-chute, thereby attaching the same in position to deliver the buttons, as above described.

75 is a projection on the button-chute, which engages within the opening 74 for connecting the chute or the hopper and chute *x* to the machine, Fig. 2.

76 is a hook on the locking-bar adapted to engage with the notch 25, Figs. 3 and 13.

78 is a pivot for attaching the lever 28 and also for supporting the spring-bearing shaft 32 on the main frame or casting A, Figs. 3, 5, and 13.

79 is a part of the plunger B, having a straight face, and is adapted to contact with the roller 27, causing thereby the operation of the wire-feeding lever 28, Figs. 17, 8, and 13.

80 is a slotted wire tube, Figs. 3 and 4.

81 is the cam-shaped end of the lock-bar 45, Figs. 8 and 13.

82 is a projection on the staple-former 18 and which forms a stop adapted to engage in a groove 47, formed in the staple-bender 19 for limiting the movement of the latter during the vertical movement of the plunger.

83 is a shoulder on the staple-bender 19, Fig. 8.

84 is a slotted tube through which the wire is passed and which forms a guide therefor, furthermore acting as a stop for the action of the jaw 52, Fig. 3.

85 is a pivot upon which the button-retaining hook 55 turns, Figs. 11 and 12.

86 is the shaft operated by the lever 61 and which supports the button-agitator within the button-hopper, Figs. 14 and 18.

87 is a pivot connecting the hook-arm 62 to the lever 61, Fig. 18.

88 is the hooked lower end of the hook-arm 62, which comes in contact with the flange 89 of the plunger, Figs. 2 and 17.

89 is a flange or projection on the plunger B, which engages with the hook 88 of the hooked arm 62, and thereby imparts movement to the button-agitator on the downward stroke of the plunger.

90 is a spring holding the button-agitator upon its shaft, so that it will normally move with the latter, but will slip thereon in case the button-agitator is clogged by buttons or other obstacles.

91 is a pin rigid with the frame or casting A for retaining in position the steel plate 29, Figs. 3 and 13.

92 is an opening in the steel plate with which the pin 91 engages for the purpose of holding the plate in position.

93 is an extension of the plunger B, which on its downward stroke meets the shoulder 94 on the button tube and drives the tube into proper position on the machine. This is designed to secure the tube in working position in case the operator should for any reason fail to drive the same to its seat, Fig. 2.

94 is a shoulder on the button-tube 21 or on the button-tube extension of the hopper which serves to support the attaching-pin 75, the latter engaging with the opening 74, Figs. 1 and 2.

95 is a notch in the staple-former 18, which receives the eye of the button, retaining the button in place until the wire has been fed through said button, Fig. 21.

96 is the opening from the button-hopper to the button-tube, (shown in Fig. 18,) the button passing from the hopper into the tube with the eye of the button projecting through the slot 68.

97 is a coil of wire supported by the coil-holding disk 98, which is provided with a coil-holding-disk cover 99.

100 is a coil-holding-disk support.

101 is an opening through the staple-former 18 to allow dirt and refuse to fall through, so as not to clog the machine.

102 is a shoulder on the button-hook 55.

103 is the bottom of the slot in the lug 56.

104 is a stop for retaining in position the steel plate 30.

Beginning with the machine in the position shown in Fig. 1 and with a button in position

and the staple-wire threaded through the eye 65 of the wire-feeding mechanism, the operation of the machine is as follows: The plunger is depressed in the case A by any suitable power and carries with it the staple-driver 20, the lock-bars 24 and 45, and mechanism attached thereto. The lower end of the lock-bar 45 comes in contact with the shoulder 46 on the staple-bending bar 19, which bending-bar is shown in Figs. 8 and 13. This causes the staple-bending bar to descend, which in its descent cuts off a section of the wire, and by its continued downward motion bends this section of wire into a staple around the staple-former 18. After the staple is thus formed the staple-former 18 is forced backward by the lower end of the driver 20 as the downward stroke continues and as shown by the dotted lines in Fig. 16. At this time the cam end 81 of the lock-bar 45 is brought in contact with the trip-pin 26, Figs. 3, 8, and 13, thereby releasing its lower end from the shoulder 46 of the said staple-bending bar 19. The plunger continuing its descent, the staple-driver crowns the staple, and the staple with the button strung thereon continues down to the clenching-die 58, as shown in Fig. 13. When the staple-bender 19 comes in contact with the fabric on the clenching-die 58, as shown in Fig. 13, it is held firmly against the same by means of the spring-pressure bar 49, Fig. 8, said spring-pressure bar being allowed to yield in order to adapt the same to material of different thicknesses. On the downward stroke of the plunger the straight face of the part 79 comes in contact with roller 27, which is attached to the wire-feeding lever 28, and thereby carries said lever to its extreme back stroke, and in doing so the swinging jaw 35 assumes a position for feeding a sufficient length of wire to make the next staple. As the plunger is depressed the pin 4, Fig. 2, comes in contact with the bottom of the slot 2, which causes the lever 6 to turn on central bolt 69, and the shoulder 9 of the lever 6 comes in contact with the stop-pin 8, thereby turning the button-feed arm 7 on the same central bolt 69, which lifts the button feed-finger 12 to a position shown by dotted lines in Fig. 2. As the feed-arm is raised to the dotted position shown in Fig. 2 the feed-finger pin 15 rides on the raceway-guard 13 until it comes in contact with the swinging cam-lever 14, which lever carries the button-feed finger back and over the lowermost button, and when the feed-finger pin 15 assumes the position shown in dotted lines in Fig. 2 it is raised far enough above the cam-lever 14 so that the said cam-lever is released from the pin 15 and is again brought back to its normal position by its actuating-spring 43 and the lever 40, as shown in Figs. 6 and 7. The machine is now at its extreme downstroke, the staple having been clenched,

securely attaching the button to the fabric. The feed-finger would now be above the lower button ready to take the same out and the wire-feeding lever would be at its extreme back stroke ready to feed the wire for the next staple. The spring 54, Fig. 17, will now lift the plunger B to the extreme top of the stroke, and in so doing the hooked end 76 of the return lock-bar 24 thereby lifts the bender 19 by notch 25 above the point where the wire is fed. The hook 76 is disengaged from the notch 25 by the action of the cam-surface 77 coming in contact with the trip-pin 26, Fig. 3. At this time the upper end of the staple-driver comes in contact with the upper end of the staple-former 18, thereby forcing the lower end of the former 18 into the line of travel of the staple-driver and into position to receive the button-eye and wire, Figs. 2 and 17. The feed-finger is now carried down by its connecting-lever 3 and levers 6 and 7, and in its descent the spring 10 causes the pin 15 to ride on the face of the raceway-guard 13. The feed-finger engages the lowermost button in the button-raceway and carries the button through the button-retaining hooks, Figs 11 and 12, and carries the button down, placing the same in the notch 95 of the staple-bender 18, Fig. 17, and by continuing the upstroke of the plunger B the cam-surface 79 rises above the roller 27, thereby releasing the wire-feed lever 28, and by the action of the spring 33, Fig. 5, the wire is carried through the eye of the button. The machine has now reached its normal position or position from which it started.

Fig. 2 represents the button-feeding tube 21 in position, which is detachable, and I have provided a button-hopper or feeding mechanism, such as shown in Figs. 14 and 18. This button-hopper is provided with a button-tube and with the same mechanism for retaining the buttons in columns, as shown in Figs. 11 and 12, and has the same attachment to the tube-holder 17, Figs. 1, 2, and 3. When the button-hopper is placed on the machine, the hook 88 of the hooked arm 62, Fig. 18, engages with the flange or projection 89 of the plunger B, which causes the button-agitator to revolve or partially revolve in one direction. This agitator 63 is provided with one or more sprockets and has a reciprocating motion past the outlet 96, Fig. 18. Lever 61 being rigidly attached to the central shaft 86, a downward motion of the lever will operate the agitator. The lever can be moved by hand, if desired; but I have provided for its automatic operation. The lever 61 is held in its normal position by spring 64. This spring being immediately attached to hook-arm 62 at a point 65 at one side of the pivot 87, upon which the hook-arm swings, it is apparent that the hook-arm will be held away from the center of the hopper and upwardly by the

spring tension; but its motion in these directions will be limited by the stop and guide 105. It will be seen also that the curved face of the hook-arm riding upon the stop 105 gives a directly vertical motion to the hooked lower end 88.

This machine is provided for handling buttons of different sizes by means of the adjusting action of the spring 10, as follows: When the feed-finger carries the button down to the notch 95 of the staple-former 18, the further downward motion of the feed-finger is arrested by the positive contact of the button-eye with the former 18. The point at which the motion is so arrested will vary with the varying sizes of the buttons as the feed-finger rests upon the upper edge of the button; but on account of this spring connection between the feed-finger and the lever 6, which connection will yield, the motion of this lever, caused by the continuing downward stroke of the plunger, may continue for a considerable distance instead of being forcibly and prematurely stopped by the stopping of the button when the machine is using buttons larger than the size for which it is primarily adapted. When the feed-finger receives no button, said feed-finger pin continues down and comes in contact with the pivoted lever 16, Figs. 2 and 4, and by the action of the pin upon the lever 16 the hooked end 72 engages with the stop-pin 37, and thereby arrests the operation of the wire-feeding mechanism, so that the machine will not move forward the wire nor make a staple except when the feed of a button has been completed and the button placed in position to receive the wire through the button-eye.

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

1. In a staple-driving mechanism, the combination of a staple-driver, a staple-bender, a lock-bar for depressing the bender, a lock-bar having a hook for engaging and elevating the bender, means for withholding said hook from engagement with the bender until the latter has completed the operation of forming the staple, and means for causing the hook to engage and elevate the bender after the staple is formed.
2. In a button-attaching machine, the combination with the machine-frame of a button chute or tube detachably connected with said frame, and a plunger arranged in suitable relation to said chute, said plunger and the button-chute being provided respectively with abutting surfaces which engage each other and drive the chute to its operative position, substantially as described.
3. In a button-setting machine, and in combination with a removable button-hopper having agitating mechanism for the buttons contained therein, spring-controlled means car-

ried by, and actuating the agitating mechanism, for detachable engagement with the plunger, a plunger, and a projection carried by the plunger detachably engaging with such
5 spring-controlled actuating means, whereby the button-hopper may be removed from operative connection with the plunger and the button-tube substituted.

10 4. In a button-attaching machine, the combination of a button-feed finger, a feed-arm pivotally connected therewith, a feed-lever, and a spring connection between said feed

lever and finger adapted to allow the feed-lever to complete its normal stroke after the feed-finger is arrested by the stoppage of the 15 button.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

WILLIAM E. ELLIOTT. [L. s.]

Witnesses:

ARTHUR C. DENISON,
CHRISTOPHER HOUELINK.