

Nov. 26, 1935.

W. E. ELLIOTT

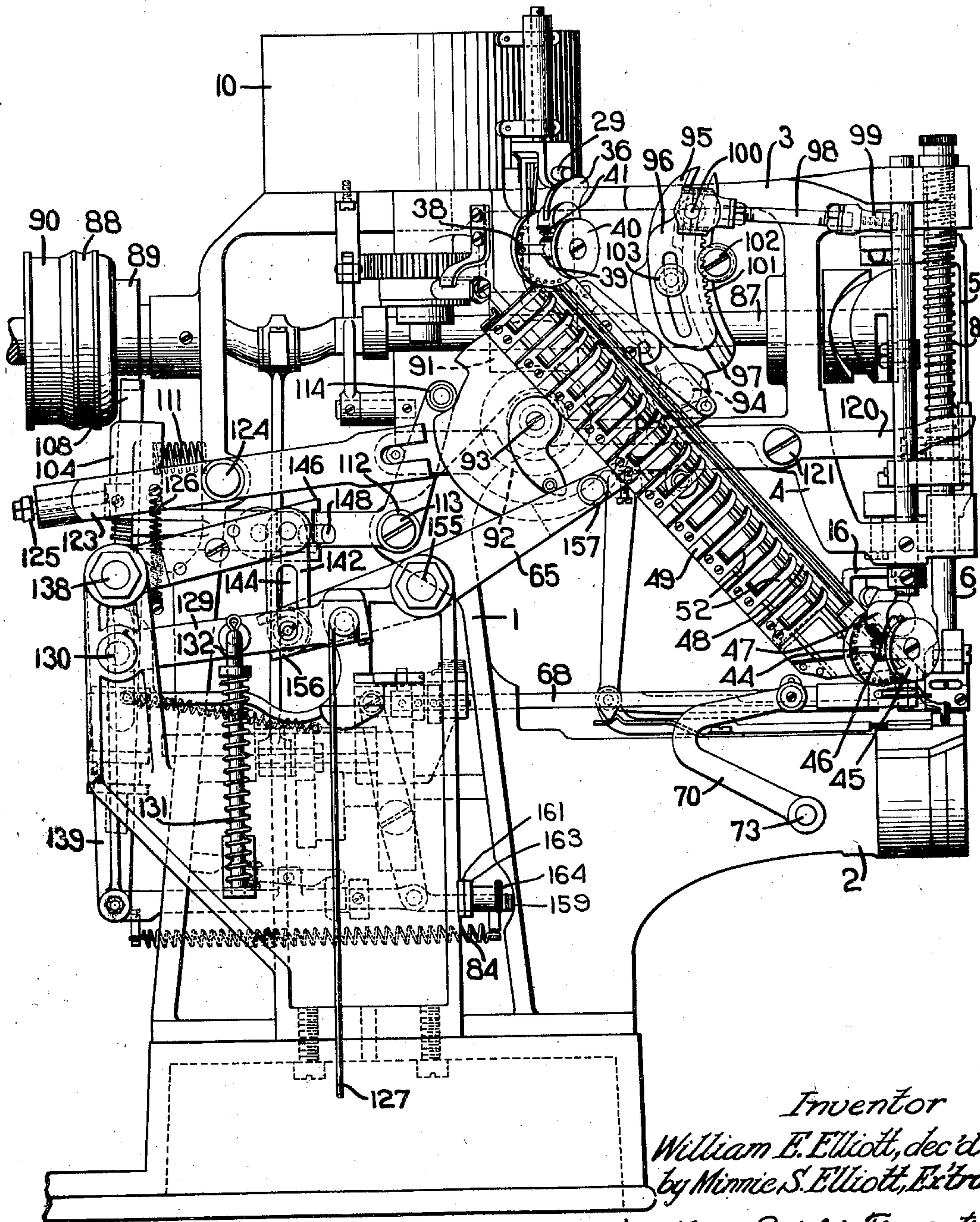
2,022,277

BUTTON FASTENING MACHINE

Filed March 14, 1932

4 Sheets-Sheet 1

Fig. 1.



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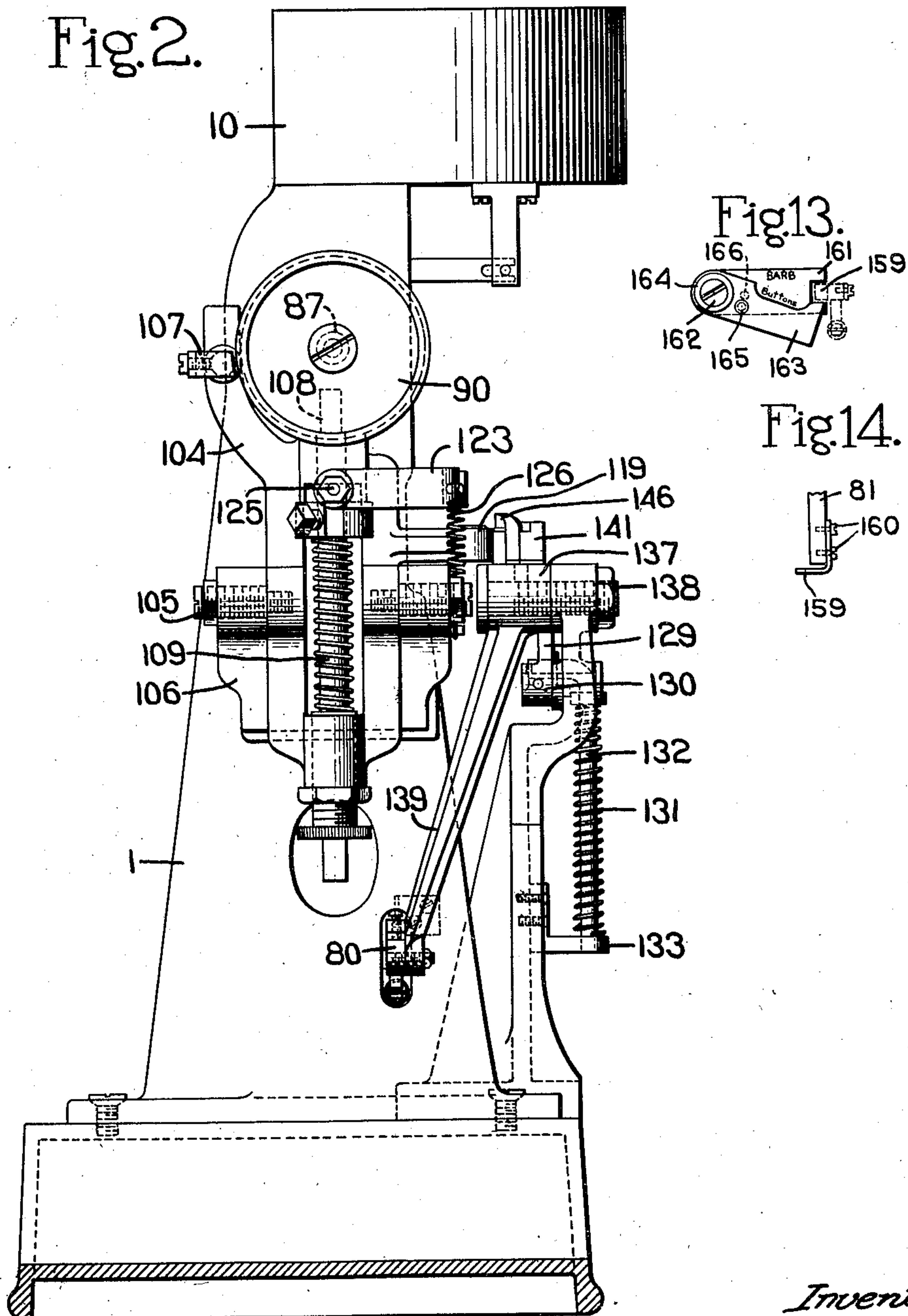
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BUTTON FASTENING MACHINE

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4 Sheets-Sheet 2



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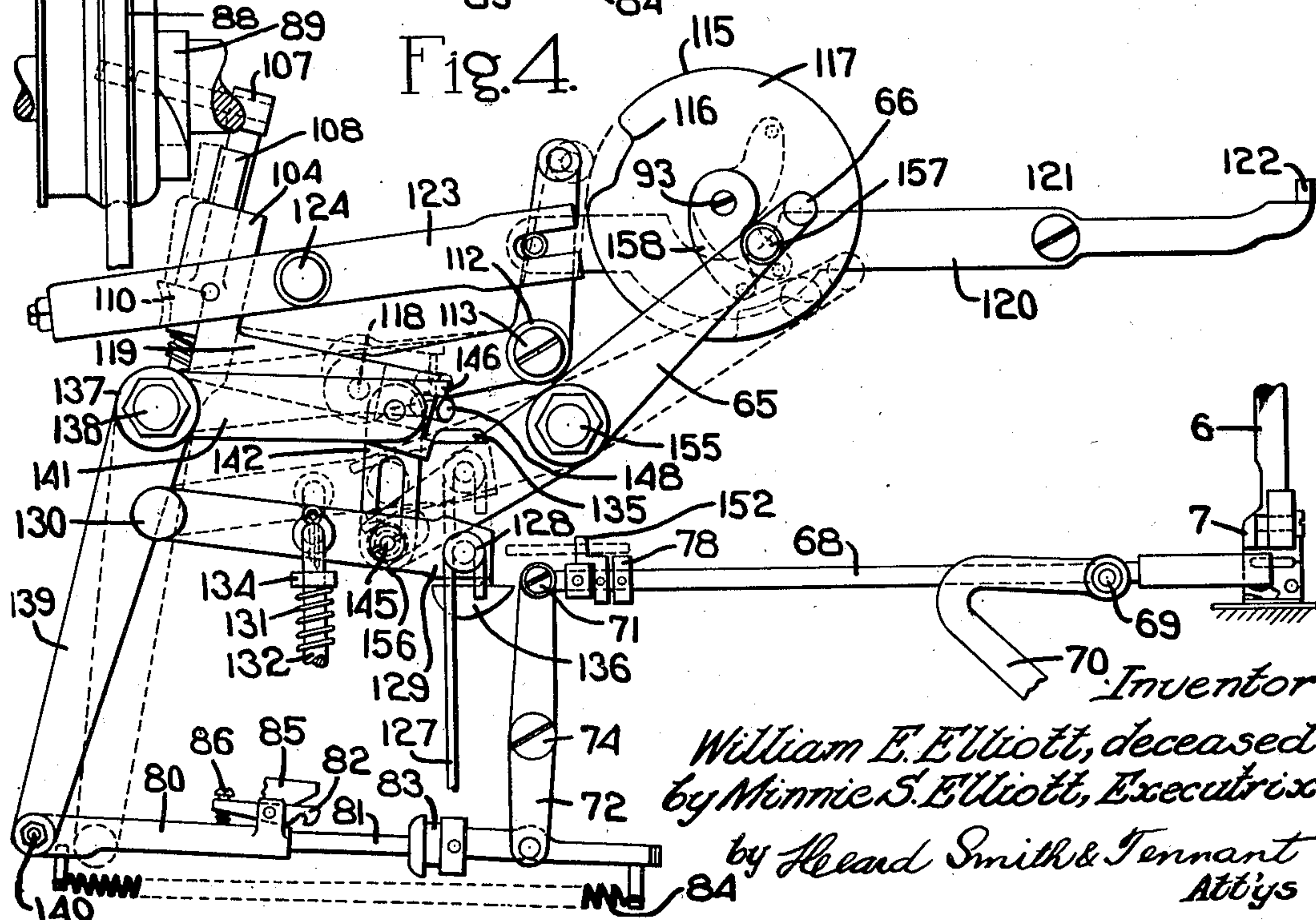
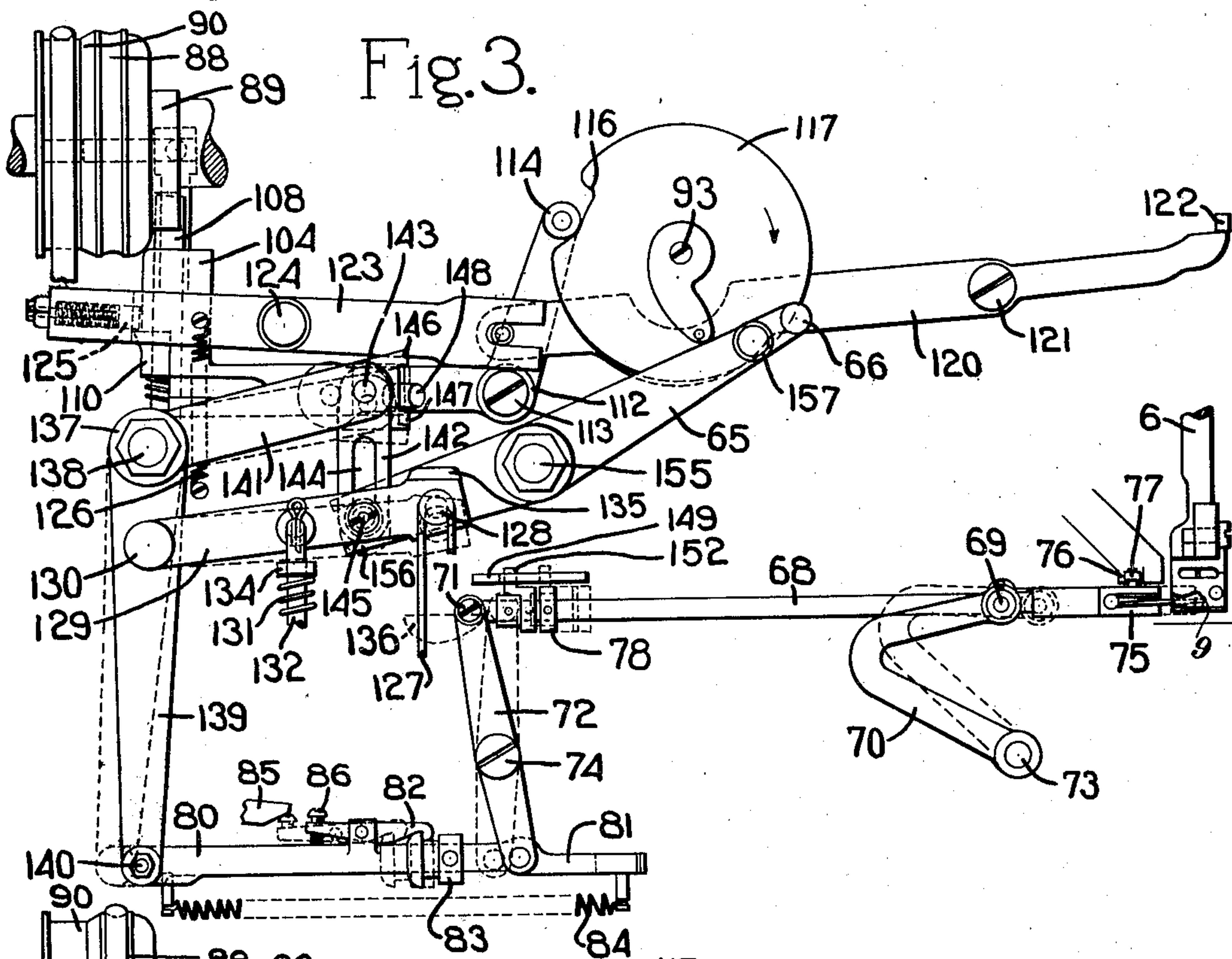
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BUTTON FASTENING MACHINE

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4 Sheets-Sheet 3



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BUTTON FASTENING MACHINE

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4 Sheets-Sheet 4

Fig. 5.

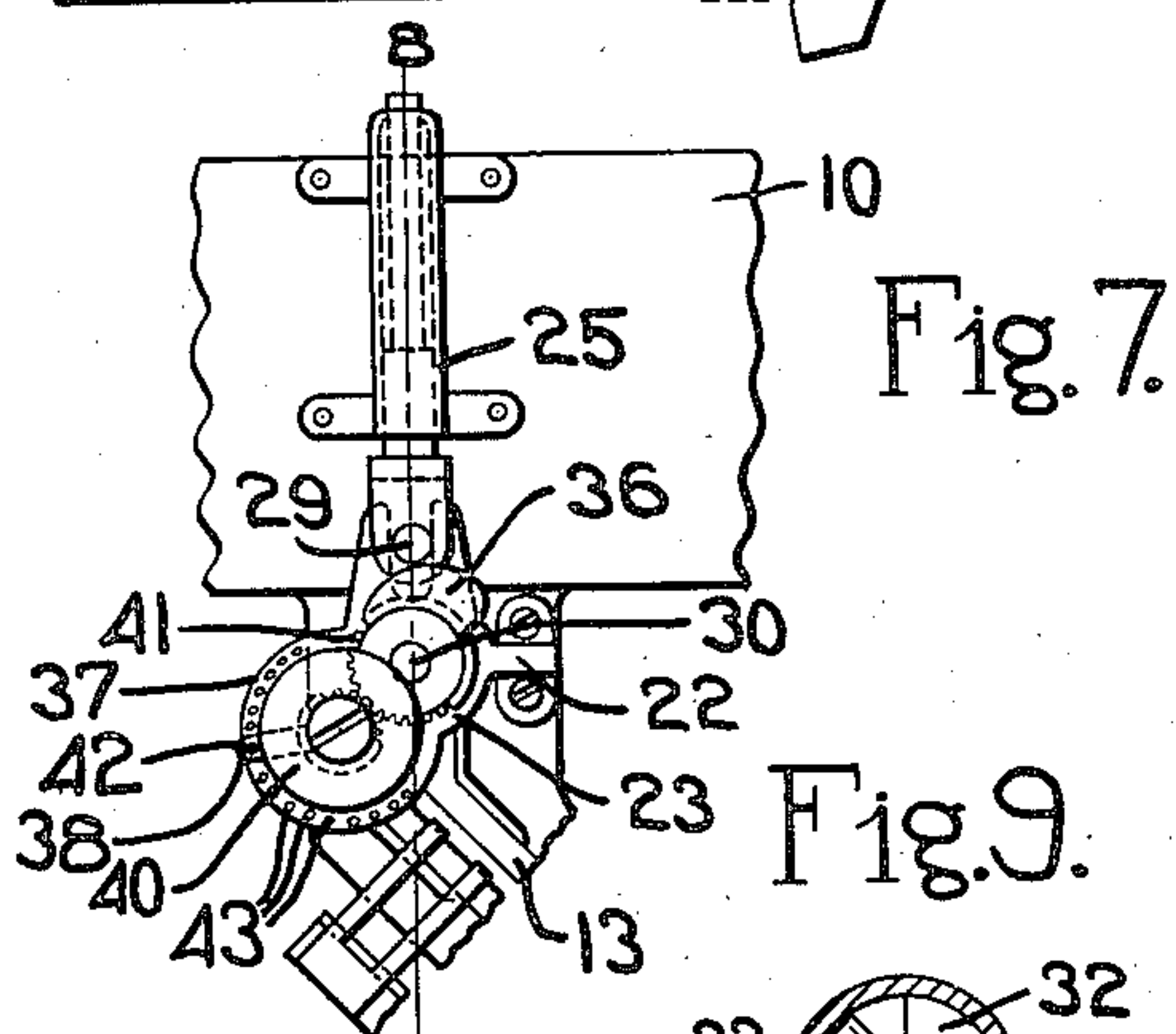
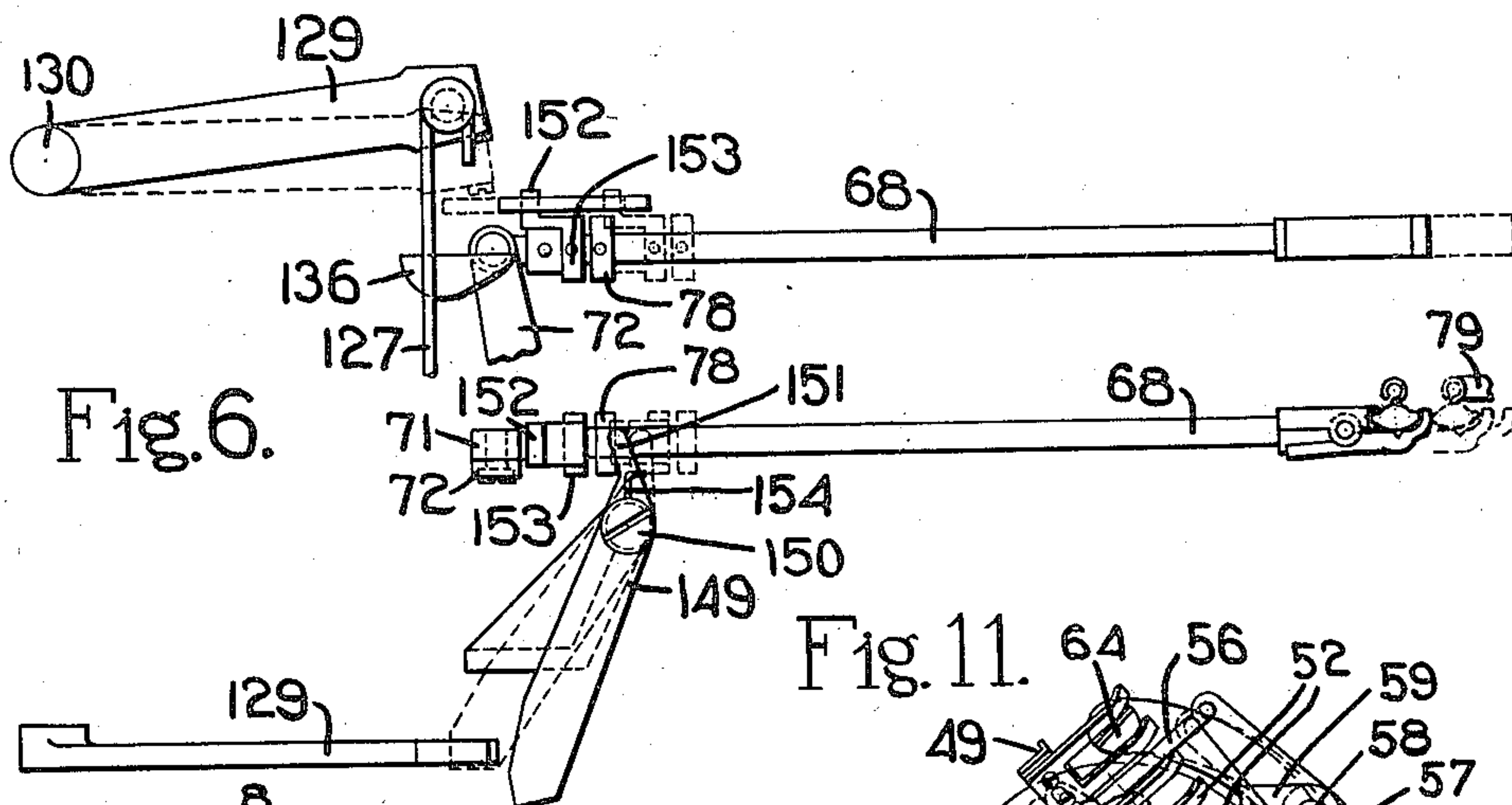


Fig. 8.

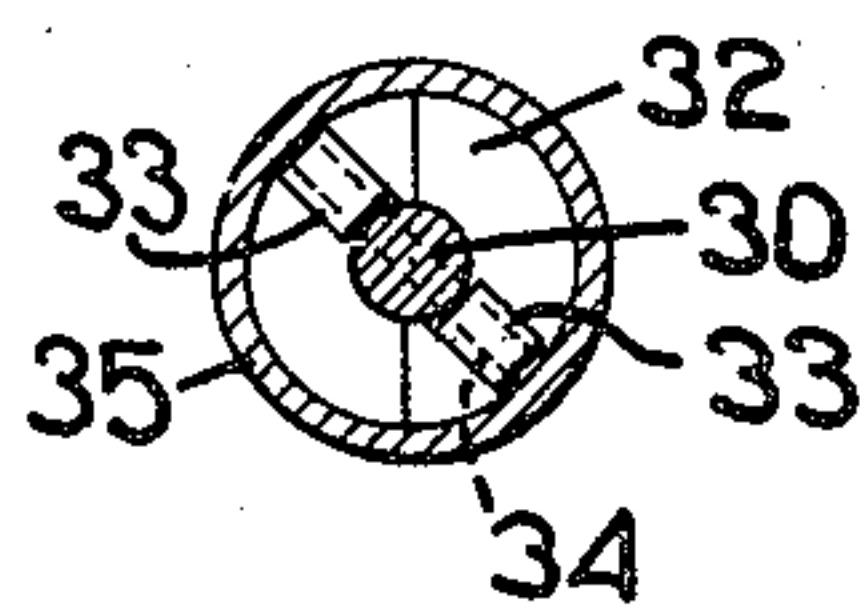
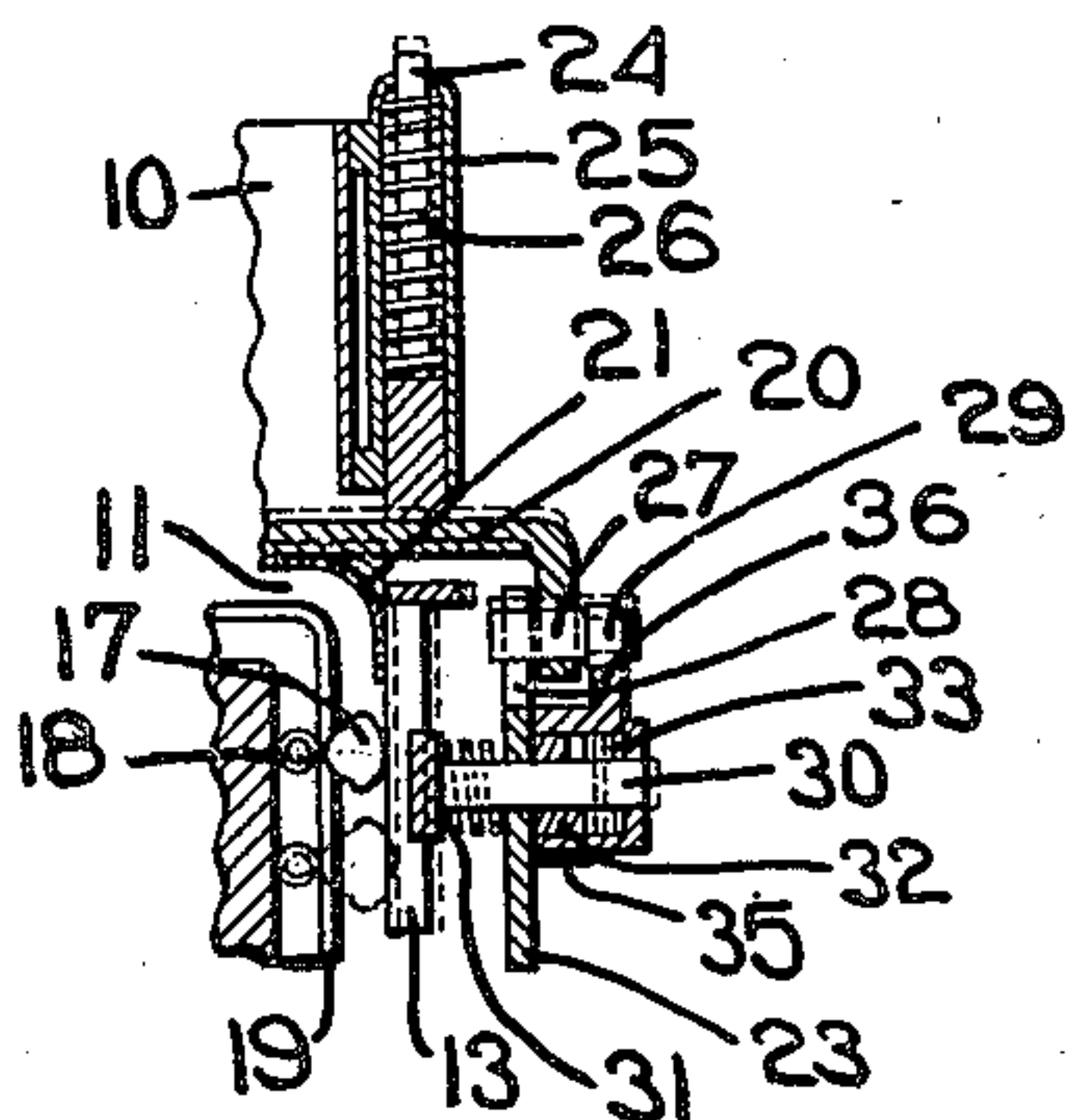


Fig. 10.

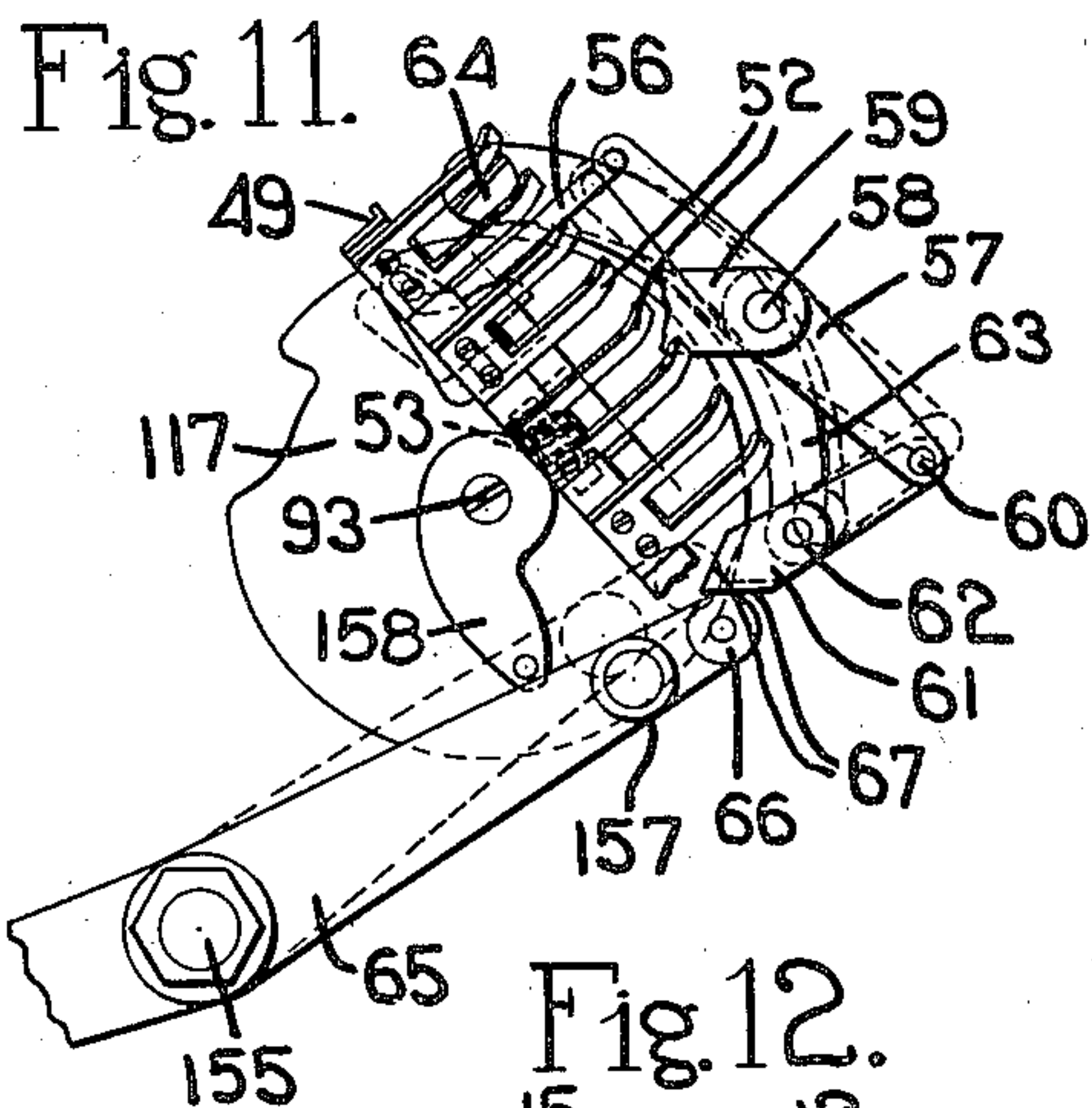
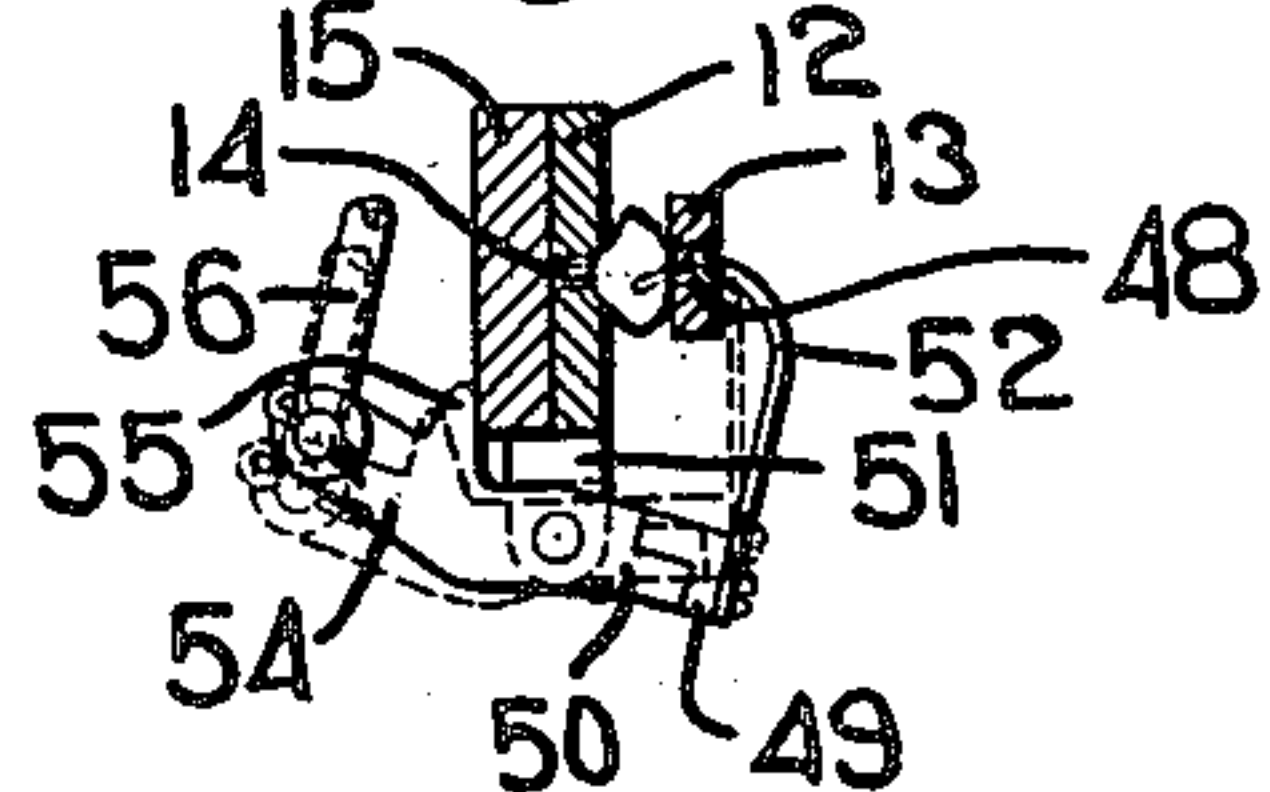


Fig. 12.



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UNITED STATES PATENT OFFICE

2,022,277

BUTTON FASTENING MACHINE

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Application March 14, 1932, Serial No. 598,624

17 Claims. (Cl. 112—108)

This invention relates to a machine for fastening, preferably by stitching, buttons, preferably the ordinary shoe button type, to desired articles such as shoes. The invention is preferably embodied in a machine of the general type shown in the patent to Sullivan et al., No. 1,149,474, August 10, 1915.

The object of the invention is to provide novel means for adjusting the size of the passageway from the hopper and in the button-feeding chute of the machine.

The object of the invention is further to provide novel means for effecting the operation of the gripping and releasing of the button carried by the button carrier.

The object of the invention is further to provide novel means for maintaining the relation between the button-feeding chute and the button carrier for different sizes of buttons.

The object of the invention is further to provide means for preventing the starting of the machine if a button is not transferred from the chute by the button carrier upon the operation of the carrier.

The object of the invention is further to provide means for preventing the starting of the cycle of operation of the machine if the button carrier moves beyond button-fastening position.

The object of the invention is further to provide means for insuring the passage of the buttons down the button feeding chute.

The object of the invention is further to provide novel means for adjusting the throw of the vibrating needle bar employed for fastening the button thus to vary the length of bar formed by the stitching mechanism.

The object of the invention is further to provide means for enabling the machine to be utilized for barring work.

These and other objects and features of the invention will appear more fully from the accompanying description and drawings and will be particularly pointed out in the claims.

In the drawings:

Fig. 1 is a rear elevation of a machine of the type referred to, together with preferred forms of the various features of this invention embodied therein.

Fig. 2 is an end elevation of the machine frame and many of the elements of the machine.

Fig. 3 is a rear elevation of certain elements of the machine detached therefrom with the parts shown in full lines with the machine stopped.

Fig. 4 is a view similar to Fig. 3 with the parts shown in a different position.

Fig. 5 is a rear elevation of the button carrier and connected parts.

Fig. 6 is a plan view of the construction shown in Fig. 5.

Fig. 7 is a rear elevation of the button passageway adjusting means at the upper end of the chute.

Fig. 8 is a view in cross section on the line 8—8 of Fig. 7.

Fig. 9 is a view in vertical cross section showing the rolls 33 and the end of the cam 32 cooperating therewith.

Fig. 10 is a perspective view of the cam 32.

Fig. 11 is a rear elevation showing the mechanism for operating the button agitator.

Fig. 12 is a view in cross section taken transversely of Fig. 11 to show the operation of the agitator.

Fig. 13 is a detail in end elevation of the construction enabling the machine to perform barring work.

Fig. 14 is a detail in plan of the end of the connecting rod.

The general construction of the machine is similar to that shown in the aforesaid patent to Sullivan et al. and is of a type well known in the art so that it is only necessary here to describe in detail a preferred embodiment of those features with which the present invention is particularly concerned.

The machine comprises a suitable frame having the hollow standard 1, the laterally extending tubular work supporting arm 2, and the overhanging bracket arm 3 with its head 4. The needle frame 5 is mounted to swing on vertical pivots in the head and carries the usual reciprocating needle bar and needle cooperating with the shuttle or other looper in the work support to form the bar by means of which the button is secured to the work. The presser bar 6 is mounted in the head 4, carries at its lower end the presser foot 7 and is pressed down into working position by the usual spring 8. The presser foot including the button shank guideway 9 is of the usual construction to receive and guide the button into button-fastening position.

The button hopper 10 which contains the supply of buttons is mounted upon the top of the bracket arm 3 and presents at the side the discharge aperture 11 leading into the upper end of the button chute by which the buttons are conveyed from the hopper to the button guideway of the presser foot. This button chute comprises the two parallel flat plates 12 and 13, the plate 12 being slotted at 14 to receive the button shanks

and the two plates being separated sufficiently to provide for the passage of the button heads therebetween. The plate 12 near its upper portion is secured to a bracket 15, in turn secured to the bracket arm 3 and adjacent its lower end to a bracket 16 mounted from the head 4. The buttons which are shown as of the ordinary shoe button type having the heads 17 and shanks 18 pass from the hopper through the opening 11 with the shanks riding in the slot 19 which continues into the slot 14 of the plate 12 and with the heads riding against a cap plate 20 having a flexible strip 21 connecting it with the plate 13. While the buttons may be of various shapes, they are shown as of the roll type and the slot in the hopper and in the button chute is rounded at the edges to enable a portion of the button as well as the shank to ride freely therein. In order to provide for buttons of different sizes, it is necessary that the plate 13 shall be accurately adjusted toward and from the plate 12 and that the cap plate 20 shall correspondingly be adjusted toward and from the bottom of the hopper. One feature of the invention provides means for effecting these adjustments. At the upper end of the chute a bracket 22 is secured to the arm 3 and terminates in a base plate 23 parallel with the chute. The cap plate 20 is carried by a vertical plunger 24 mounted in a casing 25 secured to the side of the hopper 10 and yieldingly pressed downward by the spring 26 in the casing. The cap plate 20 is extended rearward and downward and carries in its depending portion a stud 27. At its front end this stud rides in a vertical slot 28 in the base plate 23 and at its rearward end is provided with an anti-friction roller 29. A stud 30 is secured at its inner end to the plate 13 and extends through the base plate 23. A helical spring 31 on the stud between the base plate 23 and the plate 13 acts to press the latter inward or toward the plate 12. At the rear of the base plate 23 a cam 32 shown separately in Fig. 10 is journaled on the stud 30 and cooperates with follower rolls 33, see Fig. 9, journaled on a shaft 34 extending diametrically through the stud 30. The cam 32 is secured in a sleeve 35 and this sleeve is provided with a cam 36 engaging the roller 29. Consequently by rotating the sleeve 35 the follower rolls 33 cooperating with the cam 32 in conjunction with the spring 31 enables the plate 13 accurately to be adjusted toward and from the plate 12, while at the same time the cam 36 cooperating with the roller 29 in conjunction with the spring 26 simultaneously and correspondingly adjusts the cap plate 20 toward or from the bottom of the hopper, with the flexible strip yielding as required. An accurate means for rotating the sleeve 35 and indicating its position of adjustment is provided. The base plate 23 is extended to present a substantially circular section 37 and in this section is journaled a shaft carrying adjacent the base plate a pointer 38 and a pinion 39 and carrying at its outer end a knurled head 40. The pinion 39 meshes with a gear 41 on the sleeve 35. The pointer 38 is shown as provided with a pin 42 adapted to fit in any of the series of holes 43 formed in the edge of the section 37 of the base plate and the shaft carrying the pointer, the pinion 39, and the knurled head 40 is movable outward sufficiently to engage and disengage the pin 42 and is yieldingly pressed inward. A similar construction to that described is provided for the lower end of the chute and therefore needs no detailed description. The base plate with the

circular section 44 is secured to the bracket 16 and carries the shaft with the knurled head 45 and the stud 46 and sleeve 47 corresponding to the parts 40, 30, and 35 at the upper end of the chute. Thus by operating the knurled heads 49 and 45 the required adjustment of the button chute for buttons of different size is very accurately made and indicated and the parts locked in adjusted position.

It is important that the buttons shall pass continuously and freely out of the hopper into and down the button chute. Suitable means, such as shown, for example, in the aforesaid patent to Sullivan et al., provide for such passage of the buttons from the hopper into the chute. A feature of the present invention provides means for insuring the desired passage of the buttons down the chute. For this purpose the plate 13 is provided substantially throughout its length in line with the path of the button heads with a slot 48, see Figs. 11 and 12, and a series of preferably yielding fingers are mounted and operated to move periodically through the slot and into and out of engagement with the button heads thus to jar or agitate the buttons, prevent their sticking in the chute and insure their proper movement down the chute. In the preferred construction illustrated, a bar 49 extending beneath and parallel with the chute is secured to a pair of arms 50 pivotally mounted on lugs 51 extending downward from the plate 12 or its support. A series of spring fingers shown as made of flat metal are secured to the bar 49 and are curved at their upper ends so that as the bar swings on its pivots, the ends of these fingers pass through the slot 48 and agitate the buttons by yieldingly engaging with and disengaging therefrom. This button-agitating means is operated periodically. For that purpose a spring 53 surrounding one of the pivots of the bar acts to swing the bar into the position shown in Fig. 12 with the fingers 52 disengaged from the buttons. One of the arms 50 supporting the bar 49 is extended past its pivot as at 54 to form an operating lever. A lug 55 on this lever engages the bracket 15 to limit the movement of the agitating device in opposition to the spring 53. The arm 54 is connected by a link 56 to one end of a lever 57 fulcrumed at 58 on an arm 59 secured to the plate 12 or its support 15. The opposite end of the lever 57 is pivotally connected at 60 to a lever 61 fulcrumed at 62 on a curved arm 63 which is pivotally mounted at 64 from the plate 12 or its support. In the specific construction here illustrated, a lever 65, later to be described, has mounted at its free end a roll 66 and the lever 61 is provided with the oppositely beveled faces 67 cooperating therewith so that as the lever 65 is swung in either direction, the lever 61 is moved endwise with its fulcrum carried about the pivot 64 and the lever 57 is therefore rocked and thus through the connections described the agitator comprising the bar 49 and the spring fingers 52 are swung into button-engaging position. The periodic operation of the lever 65 may be secured by any suitable means but preferably, as will hereinafter be set forth, takes place each time the machine is started and each time it is stopped.

The buttons are transferred from the lower end of the button chute to the raceway in the presser foot and placed in fastening position by mechanism generally similar to that of the aforesaid Sullivan et al. patent. The reciprocating button carrier 68 is pivotally supported at 69 on 75

the arm 70 and at 71 on the rock lever 72, the arm 70 being pivoted at 73 and the lever 72 being fulcrumed at 74 on the machine frame. The button carrier is provided with the usual 5 button-gripping rock lever 75 yieldingly pressed into button-gripping position but in this case swung to open position by novel means. The lower end of the plate 13 of the button chute is provided with a laterally projecting cam 76, 10 see Fig. 3, and the rock lever is provided with a roll 77 cooperating therewith so that as the button carrier passes through its cycle of movement, the roll cooperating with the cam causes the rock lever to swing in opposition to its spring 15 to grip and release the button as required. Since the cam 76 is mounted on the plate 13 of the button chute, it is adjusted therewith toward and from the plate 12 of the chute and consequently the rock lever 75 is simultaneously adjusted as 20 required by the button size. The general operation of the button carrier with the adjustable stop collar 73 limiting the endwise movement, the stop shoulder 79 of the presser foot and the giveaway connection including the two-part 25 connecting rod 80 and 81 extending to the lever 72, the latch lever 82, the shouldered thrust collar 83 and the connecting spring 84 needs no further description at this point except that the tripping stud 85 on the frame is fixed, while the 30 set screw 86 in the latch lever 82 cooperating therewith is adjustable. This mechanism, however, involves a further feature of the invention which will hereinafter be described.

The main shaft 87 of the machine is of the 35 usual type provided with the fast pulley 88 and stopping cam 89 and with the loose pulley 90. This shaft, in the present form of construction, is provided with a worm 91 meshing with a worm wheel 92 on a transverse shaft 93. The main 40 shaft also is suitably connected to operate the transverse rock shaft 94 by which the needle bar frame 5 is vibrated to produce the bar required for fastening the button. A further feature of the invention resides in the means for 45 providing an adjustable connection for jogging or vibrating this needle frame so as to produce a bar of any desired length without disturbing the position of the needle with respect to the eye of the button. For this purpose a rock arm 95 50 is secured to and extends upward from the shaft 94 and has adjustably mounted thereon a plate 96. This plate is provided with a rib riding in an arcuate groove 97 of the arm 95. The connecting rod 98 is connected by a universal joint 55 99 to the needle bar frame at its opposite end by a universal joint 100 to the plate 96. The center of curvature of the groove 97 is at the joint 99 so that whatever may be the adjusted position of the plate 96, and consequently whatever 60 may be the length of the bar formed, the needle will always be centered at one end at the button eye. The plate 96 is provided with a rack 101 and is adjusted by means of a stud 102 mounted in the arm 95 and having a pinion 65 engaging this rack, while a set screw 103 in the arm 95 passing through a curved slot in the plate 96 locks the parts in any desired position.

This type of machine makes a single cycle of operations for stitching or fastening a button to 70 the work. This cycle of operations is usually started by the depression of a starting treadle by the foot of the operator. An important feature of the present invention resides in means for preventing sufficient depression of the starting 75 treadle to start the machine in case no button

is carried into fastening position by the button carrier—means are also provided to raise the starting treadle positively into non-starting position if the treadle is inadvertently held down 5 by the operator at the conclusion of a button-fastening operation. In a preferred embodiment of these features of the invention, the main elements for controlling the starting and stopping of the machine which are disclosed in the 10 aforesaid patent to Sullivan et al. are associated with additional elements by means of which the desired results are secured and it is therefore necessary only to describe in detail the additional features involved. The vibratory stop lever 104 fulcrumed at 105 in the bracket 106 on the 15 machine frame, the belt shifter 107 at the upper end of the stop lever, the plunger rod 108 mounted in the stop lever and yieldingly projected upward by the spring 109 and cooperating at its upper end with the cam 89, the thrust collar 110 adjustably secured on the plunger rod, the spring 20 111 normally forcing the stop lever laterally against the cam 89, the bell crank lever 112 fulcrumed on the frame at 113 with its follower 114 cooperating with the face 115 and the notch 116 25 of a cam 117 secured to the shaft 93 and driven step by step from the main shaft, the connection at 118 between the bell crank lever 112 and the arm 119 of the stop lever 104, the lever 120 fulcrumed at 121 and engaging the lug 122 on the 30 presser bar 6, the rock lever 123 fulcrumed at 124 having at one end the forked connection with the lever 120 and carrying at the other end the spring-pressed plunger pin 125 cooperating with the thrust collar 110, the spring 126 depressing the free end of the rock lever 123 are 35 all shown as constructed and co-acting substantially as in the aforesaid patent to Sullivan et al.

In the further preferred embodiment of the invention the rod 127 extending downward to the 40 starting treadle is hooked over a stud 128 on the free end of an arm 129 pivoted at 130 on the machine frame and normally pressed upward by the spring 131 on the rod 132, which rod is pivoted at its upper end to the arm 129 and slides at its 45 lower end through a lug 133 on the machine frame and carries a collar 134 with the spring seated between the lug 133 and this collar. The movement of the arm 129 is limited in an upward direction by a stop lug 135 and in a downward 50 direction by a stop lug 136 on the frame. A bell crank lever 137 is fulcrumed on a stud 138 aligned with the fulcrum 105 of the vibratory stop lever. One arm 139 of this bell crank lever depends downward and is pivotally connected at 140 to the 55 part 80 of the connecting rod which operates the button carrier 68. The other arm 141 extends above the arm 129. A link 142 is pivoted at 143 to the arm 141 and is provided with a slot 144 fitting over a stud 145 projecting from the arm 60 129. The end of the arm 141 of the bell crank lever is provided with the bifurcations 146 and 147 straddling a stud 148 in the end of the arm 119 of the vibratory stop lever.

The general operation of the foregoing mechanism will readily be apparent. At the beginning of the cycle of operations the machine is stopped with the parts in the position shown in Fig. 3. The belt is on the loose pulley 90, the 70 follower 114 is in the notch 116 of the cam 117, the plunger 108 of the vibratory stop lever is raised and locked by the cam 89, the presser bar is held elevated by the collar 110, the arm 129 to which the starting treadle is connected is against the stop 135, the lower bifurcation 147 of 75

the bell crank lever 137 is engaging the stud 148 on the stop lever and the button carrier 68 is retracted. When now the operator depresses the treadle, the arm 129 swings downward, swinging with it the bell crank lever 137 until the bifurcation 146 engages the stud 148 on the vibratory stop lever. This period of movement is sufficient to cause the bell crank lever 137 through the described connections to project the button carrier 68 until the button is carried into fastening position in the presser foot guideway or until the collar 78 engages the frame. As the depression of the treadle continues rocking the bell crank lever 137, the connection between the parts 80 and 81 of the connecting rod gives way and the bifurcation 146 in engagement with the stud 148 rocks the vibratory stop lever on its fulcrum 105 simultaneously releasing the presser foot, swinging the bell crank lever 112 to carry its follower 114 out of the notch 116 in the cam 117, releasing the plunger rod 108 from the cam 89, and shifting the belt onto the fast pulley 88, thus starting the machine in its cycle of operations with the parts in the position shown in full lines in Fig. 4. The operator then removes his foot from the treadle and the arm 129 under the influence of the spring 131 moves into its uppermost position against the stop 132, as shown in dotted lines in Fig. 4. The face 115 of the cam 117 now holds the parts in working position and the operation of the machine continues until the follower 114 again drops into the notch 116 which allows the spring 111 to act and causes the machine to stop in the well known manner.

But it may happen that for one reason or another a button has not been carried by the button carrier into button fastening position when the operator depresses the treadle and it is desirable that the machine should not go through its cycle of operations if this has occurred. The present invention provides for preventing such an occurrence. In the construction illustrated a safety lever 149 is fulcrumed at 150 on the frame to swing in a horizontal plane and projects through the frame on such a level that when swung beneath the end of the arm 129 it will engage with and stop the downward motion of the arm 129 before, through the link 142, the bell crank lever 137 has been rocked to start the machine. The inner arm 151 of this lever 149 extends over the button carrier 68 in the path of a lug 152 carried by a collar 153 adjustably secured to the button carrier 68. The collars 78 and 153 are so adjusted that if a button is present in the button carrier, as shown in Fig. 6, and is carried by the button carrier against the stop shoulder 79 into button-fastening position, the lug 152 will not be carried far enough to engage the arm 151 and there will be no movement of the safety lever and it will remain in the position shown in Fig. 6 and out of the path of the arm 129. If, however, no button is present in the button carrier, the movement of the button carrier 68 will continue past the position necessary to bring the button into fastening position and until the collar 78 engages the machine frame. This movement of the button carrier beyond button-fastening position causes the lug 152 to engage the arm 151 of the safety lever and to move the safety lever into the position shown in dotted lines in Fig. 6 so that as the operator continues to depress the treadle the arm 129 will engage the lever 149 and be locked against further downward movement, thus preventing the starting of the machine. A spring

154 on the fulcrum 150 acts to hold the safety lever in normal position. It will thus be seen that it is impossible for the operator by depressing the treadle to start the machine in operation if for any reason the button carrier fails to transfer a button from the chute into button-fastening position.

It not infrequently happens that the operator inadvertently retains his foot on the starting treadle so that the machine fails to stop at the conclusion of a cycle of movement and thus repeats the button-fastening operation upon the same button. The present invention prevents such a happening and this feature is embodied in a simple and preferred construction illustrated. A lever, which is preferably the lever 65 already described, is fulcrumed at 155 on the machine frame and has a forked end 156 engaging a stud on the arm 129 which may be the stud 145. This lever near its opposite end is provided with a follower roll 157 in the path of a wiper cam 158 secured to the shaft 93. This wiper cam is so positioned that before the notch 116 comes opposite the follower 114 of the controlling lever 112, it will engage and depress the free end of the lever 65 and thus force upward the arm 129 and the treadle connected thereto. Consequently it is impossible for the treadle to be held down when the machine completes its cycle of movement. In this connection it will be noted that since the lever 65 is connected to the arm 129, it will be rocked back and forth both when the cycle of operation of the machine is started and when it is concluded, so that the button agitator is vibrated twice on each occasion.

Suitable means are also provided to enable the machine conveniently to be utilized in performing barring work when, as illustrated, the button fastening operation is a stitching operation. To enable the machine to be utilized for this purpose, it is necessary to provide means which will allow the operation of the machine without buttons being fed. In the construction already described, if a button is not carried by the button carrier into button-fastening position, the button carrier continues past the position necessary to bring the button into fastening position and the safety lever 149 moves into position beneath the arm 129 so that it is impossible for the operator to start the machine. Means are therefore here provided to prevent the safety lever 149 from moving beneath the arm 129 when no button is carried to button-fastening position and it is desired to operate the machine for barring. As illustrated, the part 81 of the connecting rod has adjustably mounted on its free end a hook 159 held in place by set screws 160 passing through a slot therein. An arm 161 is mounted on a stud 162 on the machine frame and projects adjacent the path of the connecting rod 81 being notched at its free end to permit the free movement of the hook 159 there past. A second arm 163 provided with a handle 164 is mounted to pivot and slide longitudinally on the stud 162 and is provided with a small stud 165 entering one of two holes 166 in the arm 161 so that this arm 163 may be retained either in the position shown in full lines in Fig. 13 or in an elevated position parallel with the arm 161. When the arm 163 is in its lower position shown in Fig. 13, it does not interfere in any way with the operation of the machine as already described. If it is desired to do barring work, this arm 163 is shifted to its upper position parallel with the arm 161 and thus

its free end is brought into the path of the hook 159 on the connecting rod 81 and the parts are so adjusted that when the arm 163 is in this position, the button carrier 68 cannot move beyond button-fastening position, but will remain in that position and the safety lever 149 will therefore not interfere with the free downward movement of the arm 129. Consequently all that it is necessary to do to enable the machine to be used for performing barring work is to shift the arm 163 into its upper position.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A button-fastening machine comprising button-fastening means, a chute inclined downward and comprising two parallel plates between which the button heads are fed downward toward button-fastening position, a bar having secured thereto a series of yielding fingers, and means for vibrating the said bar at predetermined times in the operation of the machine to cause the said fingers to move into and out of the chute and yieldingly to engage and disengage the buttons.

2. A button-fastening machine comprising a frame, button-fastening means, a hopper above the button-fastening means to contain the supply of buttons, a chute comprising two parallel plates between which the button heads pass inclined downward from the hopper toward the button-fastening means, a cap plate covering the button passage from the hopper into the chute, means for simultaneously adjusting the cap plate vertically and one of the chute plates laterally to conform to the size of the buttons fed and a flexible strip connecting the cap plate and the adjustable chute plate forming one wall of the passageway from the hopper to the chute.

3. A button-fastening machine comprising a frame, button-fastening means, a hopper above the button-fastening means to contain the supply of buttons, a chute comprising two parallel plates between which the button heads pass inclined downward from the hopper toward the button-fastening means, a cap plate covering the button passage from the hopper into the chute, and means for simultaneously adjusting the cap plate vertically and one of the chute plates laterally to conform to the size of the buttons fed in which the said adjusting means comprises two cams, one for adjusting the cap plate and the other for adjusting the chute plate.

4. A button-fastening machine comprising a frame, button-fastening means, a hopper above the button-fastening means to contain the supply of buttons, a chute comprising two parallel plates between which the button heads pass inclined downward from the hopper toward the button-fastening means, a cap plate covering the button passage from the hopper into the chute, means for simultaneously adjusting the cap plate vertically and one of the chute plates laterally to conform to the size of the buttons fed and means for indicating the adjusted position of the cap plate and the chute plate.

5. A button-fastening machine comprising button-fastening means, a chute comprising two plates between which the button heads pass inclined downward toward the button-fastening means, a reciprocating button carrier for conveying a button from the chute to fastening position, the said carrier including a button-gripping rock lever, a cam on said chute and a follower on said lever cooperating to effect the grip-

ping and releasing of the button through the movement of the carrier.

6. A button-fastening machine comprising the construction defined in claim 5, together with means for adjusting the chute plate carrying the said cam toward and from the other plate to adjust the chute to the size of button heads being fed and to maintain the proper cooperative relation between the button chute and the carrier.

7. A button-fastening machine comprising button-fastening mechanism, a button-feeding chute, a button carrier for transferring the button from the chute to the button-fastening mechanism, means for operating the carrier and starting the machine on its cycle of operation, and means for preventing the starting of the machine if a button is not transferred from the chute by the carrier upon the operation of the carrier.

8. A button-fastening machine comprising button-fastening mechanism, a button-feeding chute, a button-carrier for transferring the button from the chute to the button-fastening mechanism, means for operating the carrier and starting the machine on its cycle of operation, and means for preventing the starting of the machine if the button carrier when operated passes beyond button-fastening position.

9. A button-fastening machine comprising button-fastening mechanism, a button-feeding chute, a button carrier for transferring the button from the chute to the button-fastening mechanism, a treadle, means acting upon the depression of the treadle to move the button carrier to button-fastening position and then to start the machine on its cycle of operation, and a latch moved by the carrier and acting, if the carrier moves beyond button-fastening position, to lock the treadle against depression sufficiently to start the machine.

10. A button-fastening machine comprising button-fastening means, a chute inclined downward and comprising two parallel plates between which the button heads are fed downward toward button-fastening position, a vibratory button agitator comprising a series of yielding fingers movable simultaneously upon vibration of the agitator into and out of the chute and acting yieldingly to engage and disengage the buttons, and means for vibrating the agitator at predetermined times in the operation of the machine.

11. A button-fastening machine comprising button-fastening means, a chute inclined downward and comprising two parallel plates between which the button heads are fed downward toward button-fastening position, a vibratory button agitator comprising a series of yielding fingers movable simultaneously upon vibration of the agitator into and out of the chute and acting yieldingly to engage and disengage the buttons, and means for vibrating the agitator upon the starting of the machine.

12. A button-fastening machine comprising button-fastening means, a chute inclined downward and comprising two parallel plates between which the button heads are fed downward toward button-fastening position, a vibratory button agitator comprising a series of yielding fingers movable simultaneously upon vibration of the agitator into and out of the chute and acting yieldingly to engage and disengage the buttons, and means for vibrating the agitator upon the stopping of the machine.

13. A button-fastening machine comprising button-fastening means, a chute inclined downward and comprising two parallel plates between

which the button heads are fed downward toward button-fastening position, a vibratory button agitator comprising a series of yielding fingers movable simultaneously upon vibration of the agitator into and out of the chute and acting 5 yieldingly to engage and disengage the buttons, and means for vibrating the agitator both upon the starting and upon the stopping of the machine.

10 14. A button-fastening machine comprising the construction defined in claim 7, together with means for rendering inoperative the said means for preventing the starting of the machine if a button is not transferred from the chute by the 15 carrier upon the operation of the carrier thus to enable the machine to be used for barring.

15 15. A button-fastening machine comprising the construction defined in claim 8, together with means for rendering inoperative the said means for preventing the starting of the machine if the 20

button carrier when operated passes beyond button-fastening position thus to enable the machine to be used for barring.

16. A button fastening machine comprising the construction defined in claim 9, together with 5 means for preventing the said latch from locking the treadle against depression sufficiently to start the machine when it is desired to utilize the machine for barring.

17. A button-fastening machine comprising 10 the construction defined in claim 8, together with an arm and means for positioning the arm in the path of the means for operating the button carrier to prevent the button carrier from passing beyond button-fastening position when it is de- 15 sired to utilize the machine for barring.

MINNIE S. ELLIOTT,
Executrix of the Last Will and Testament of
William E. Elliott, Deceased. 20