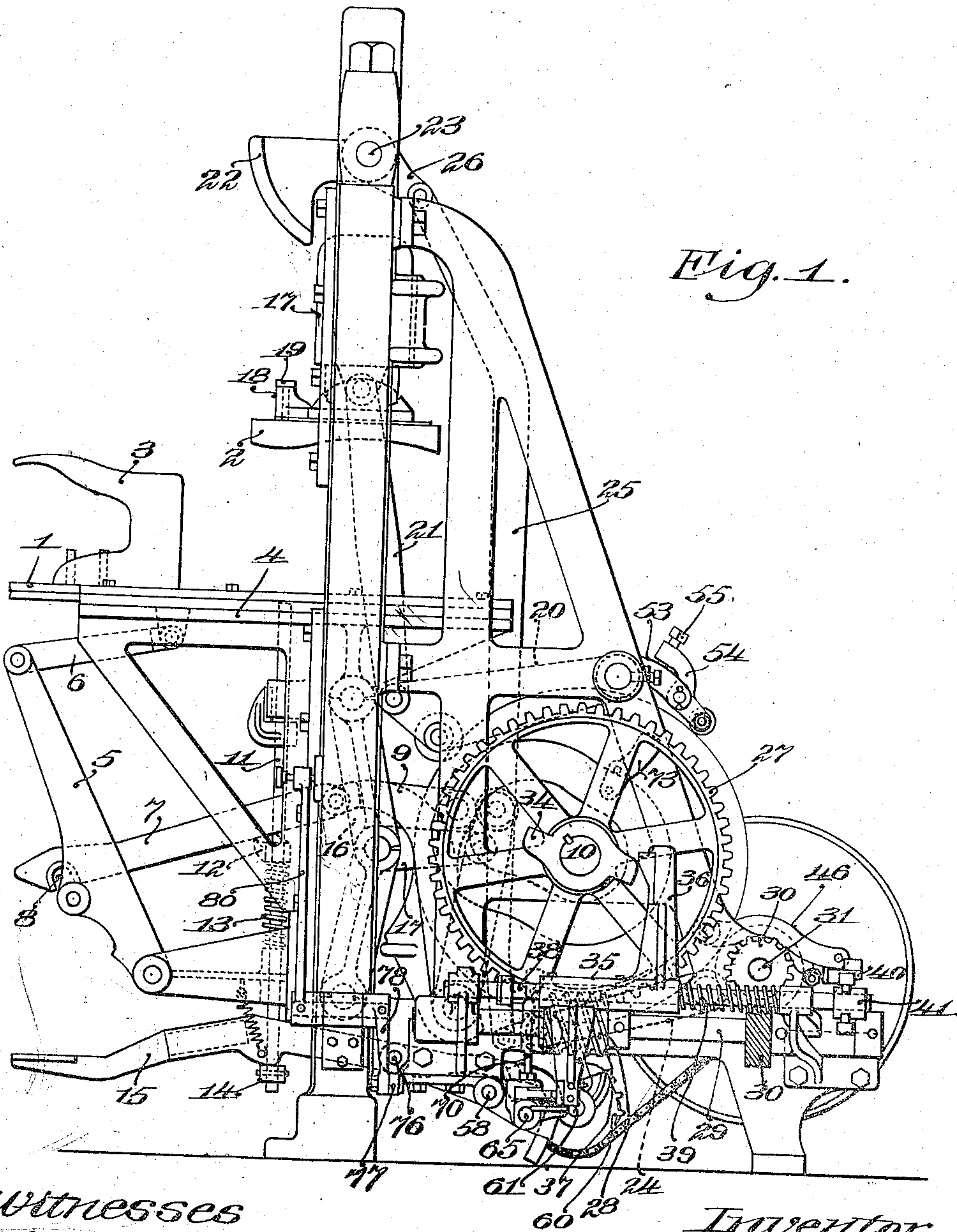


No. 881,478.

B. F. MAYO.
SOLE PRESSING MACHINE.
APPLICATION FILED MAR. 10, 1906.

PATENTED MAR. 10, 1908.

6 SHEETS—SHEET 1.



Witnesses

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6 SHEETS—SHEET 2

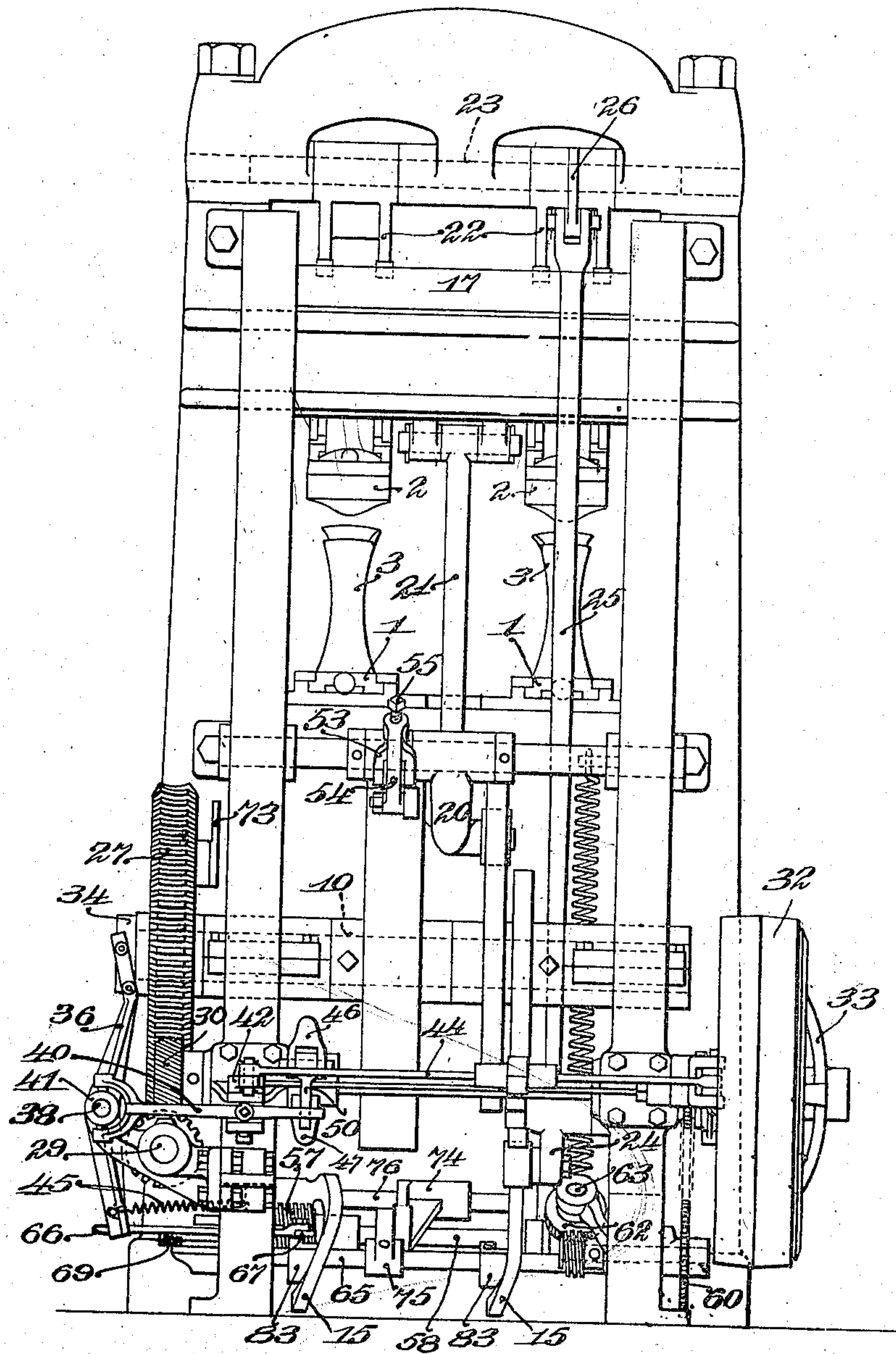


Fig. 2.

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6 SHEETS—SHEET 3.

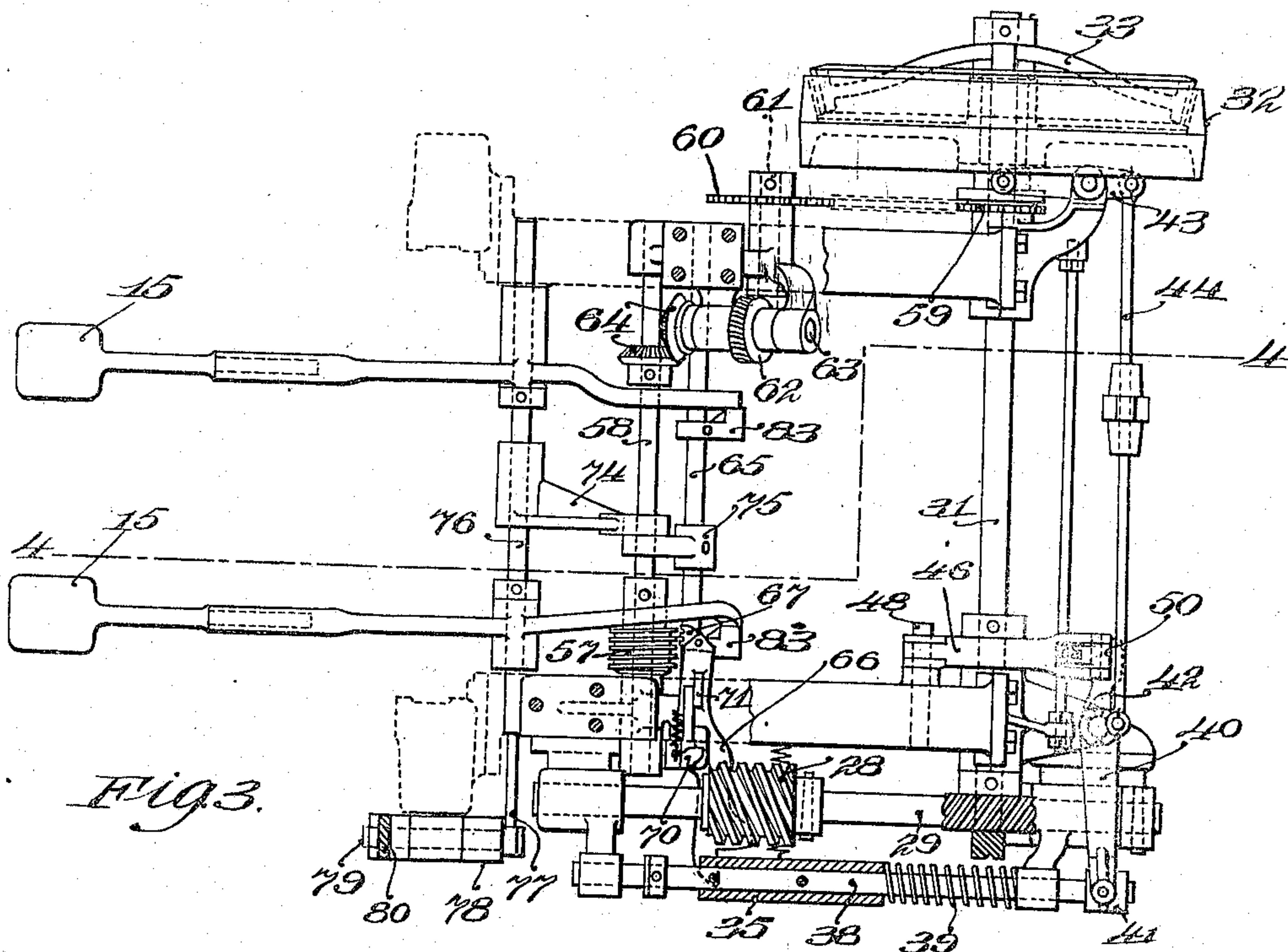


Fig. 3.

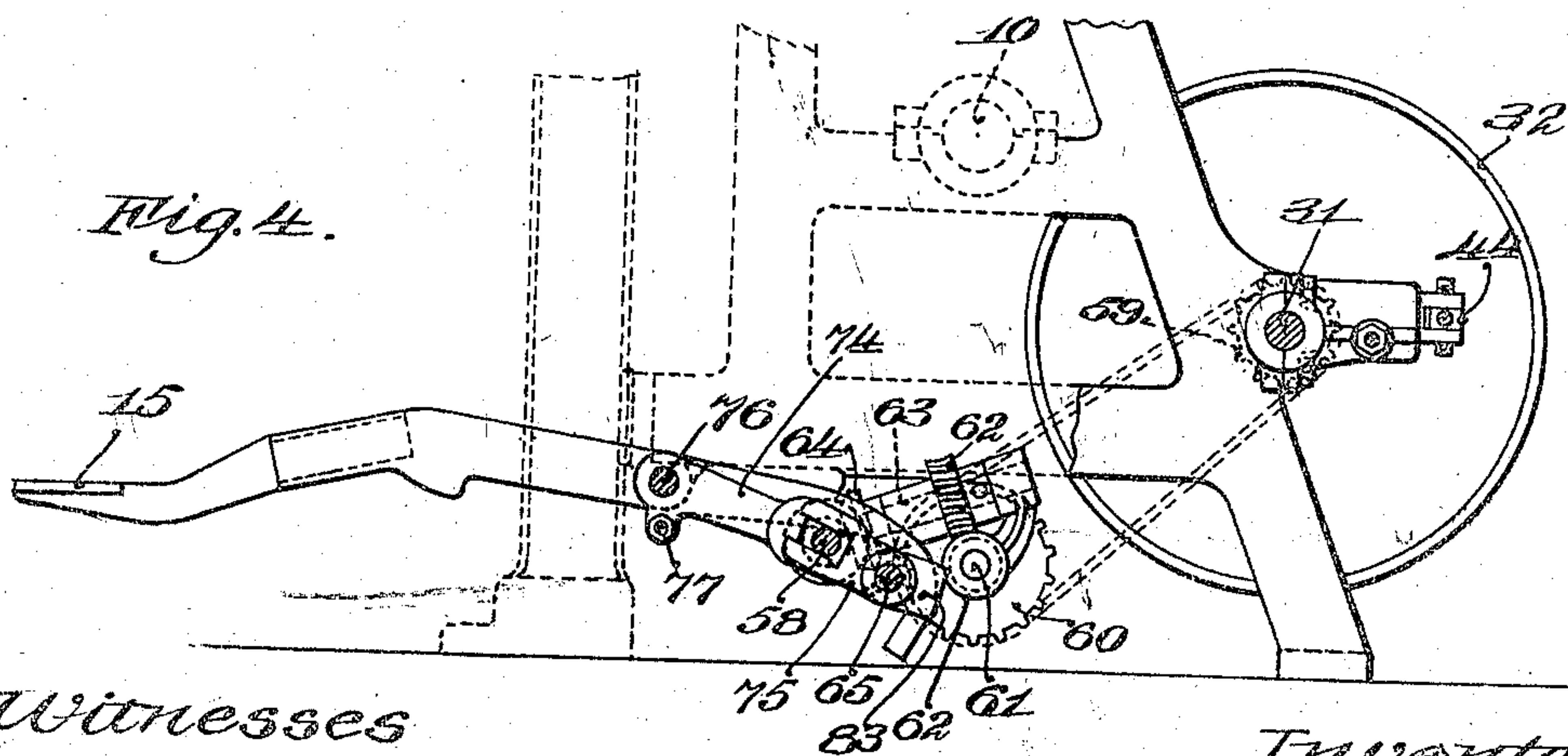


Fig. 4.

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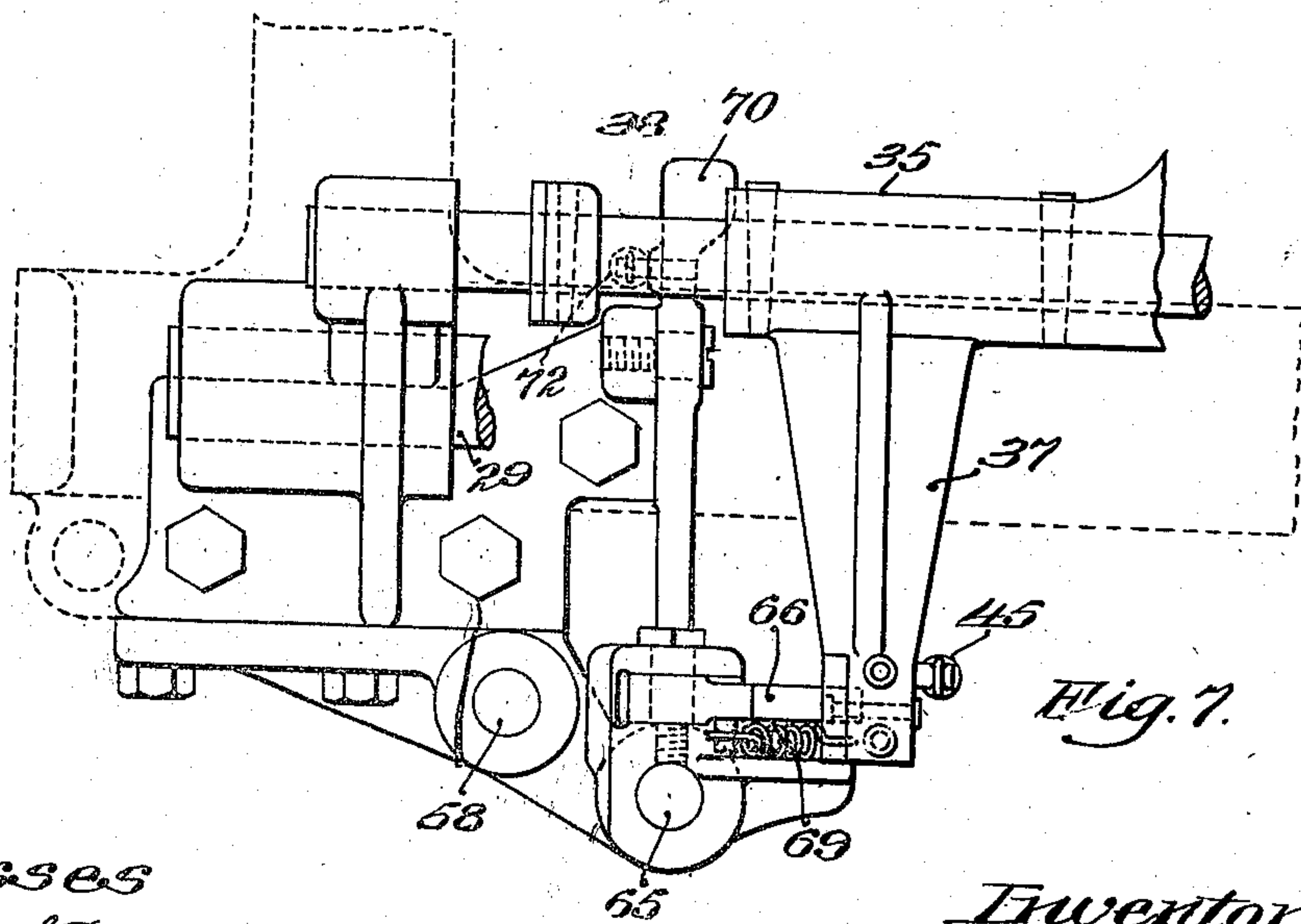
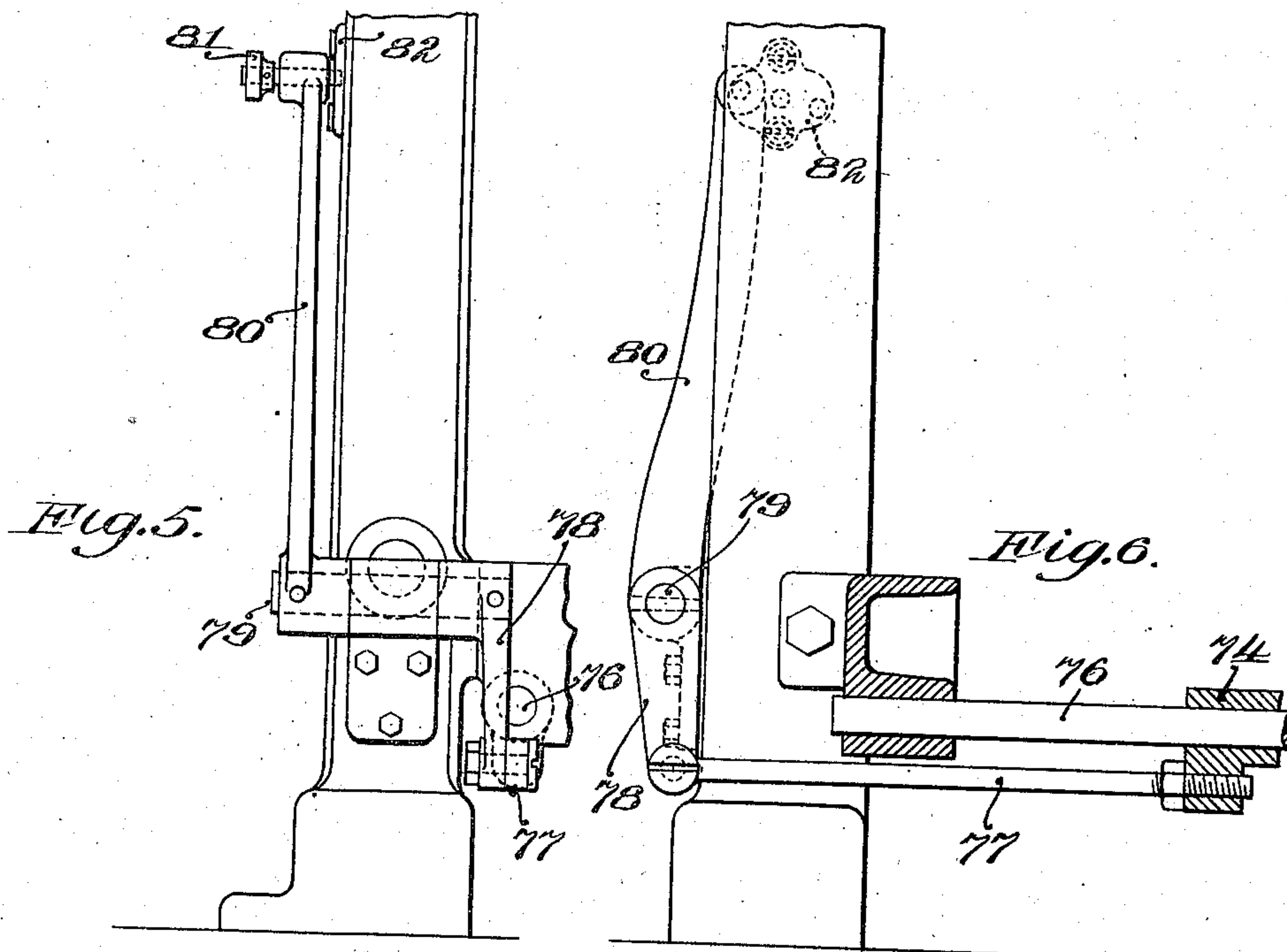
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6 SHEETS—SHEET 4.



Witnesses
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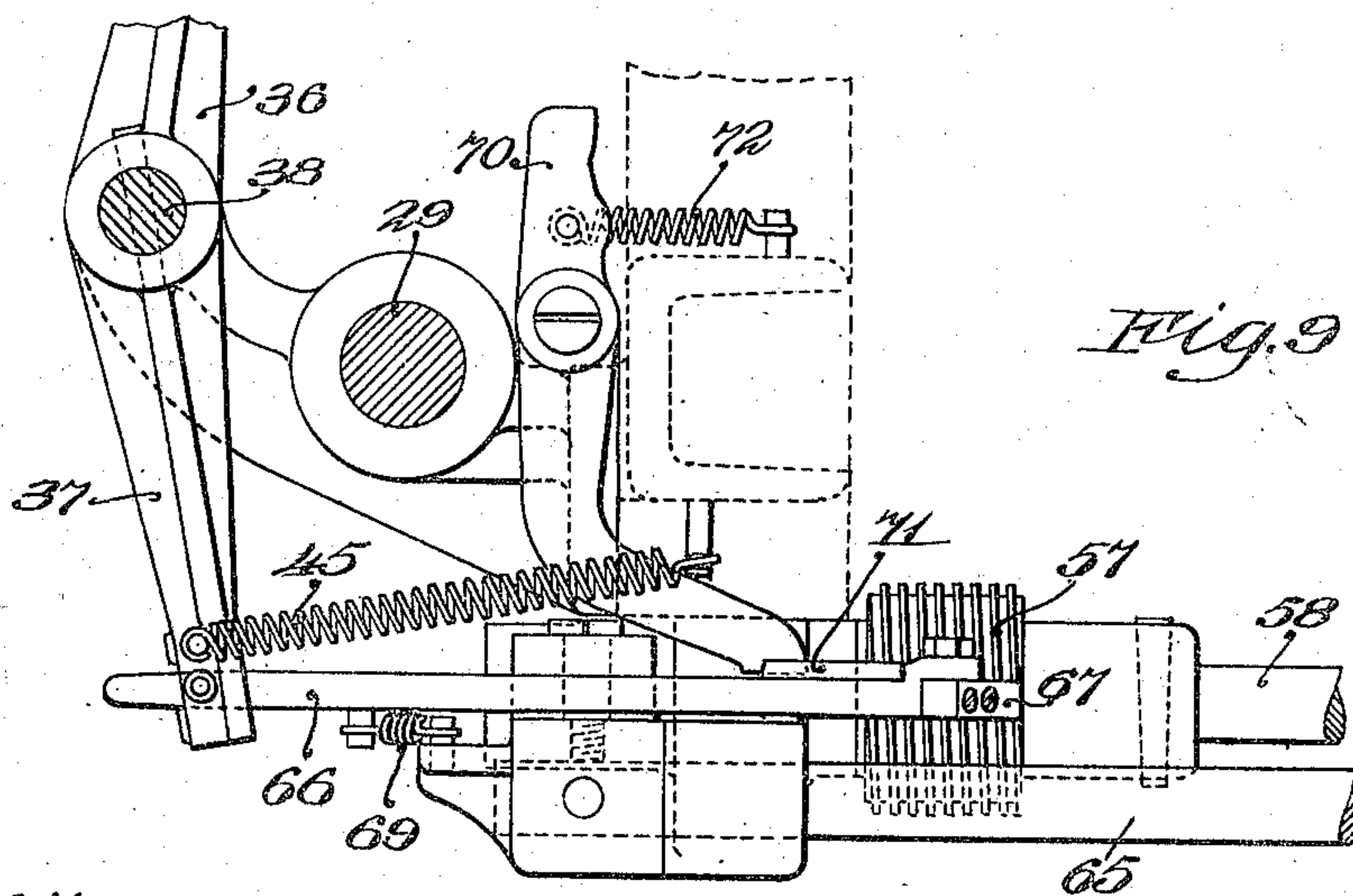
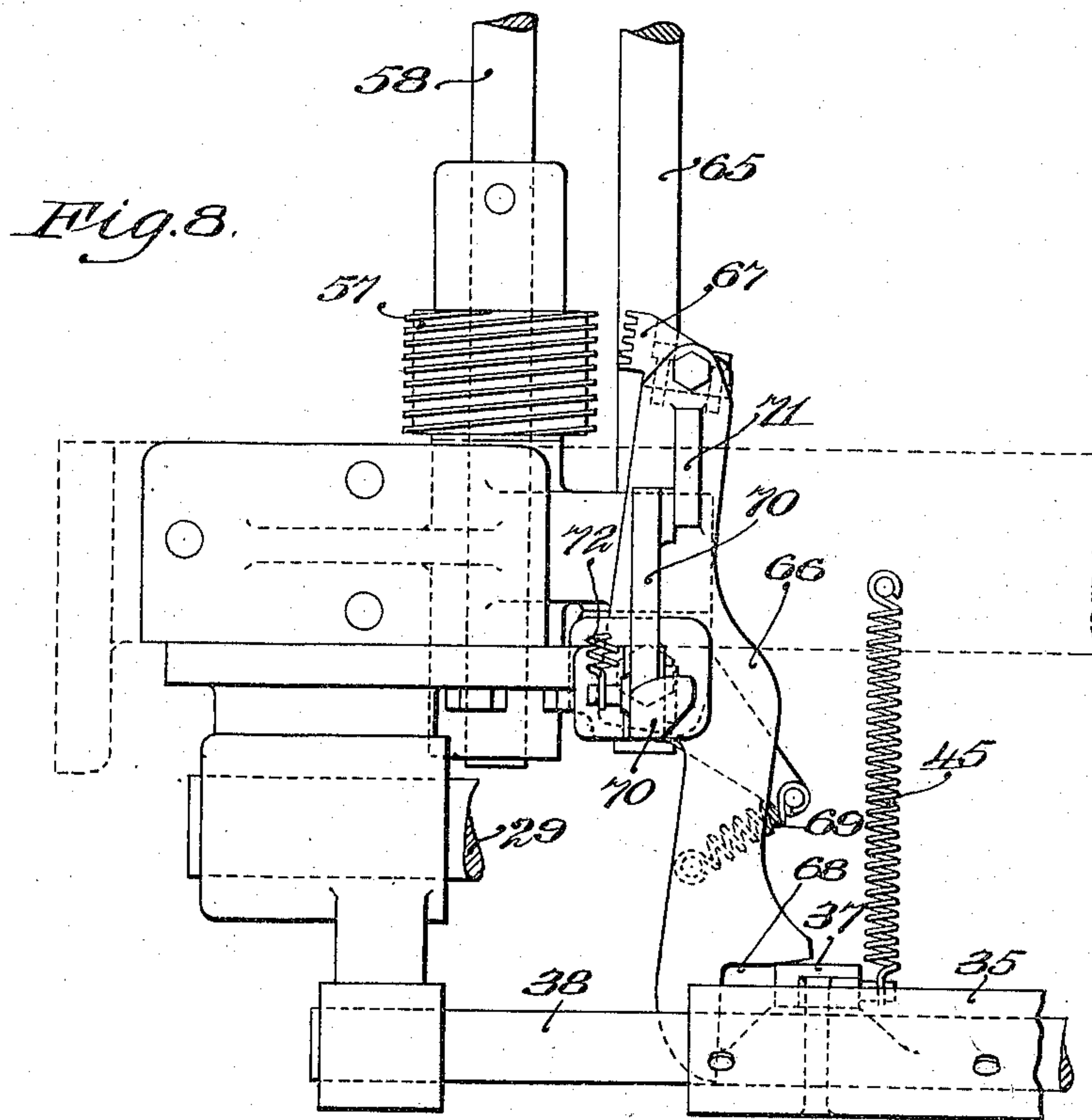
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6 SHEETS—SHEET 5.



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6 SHEETS—SHEET 6.

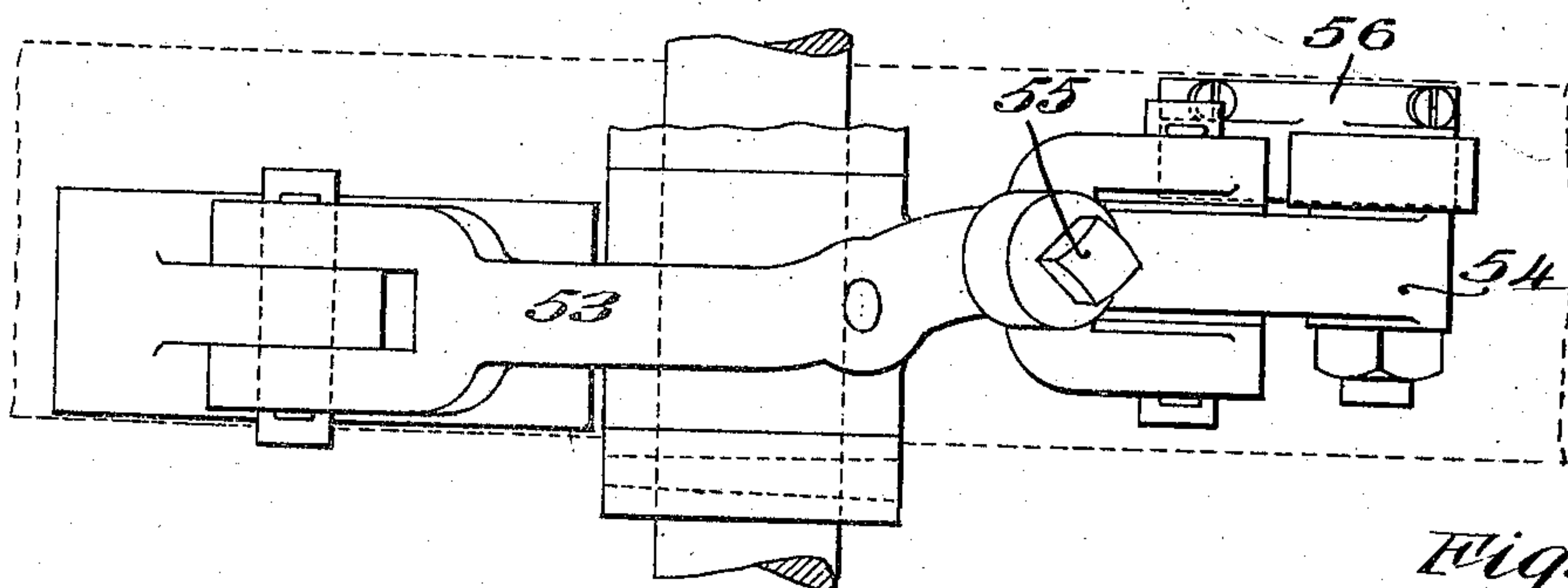
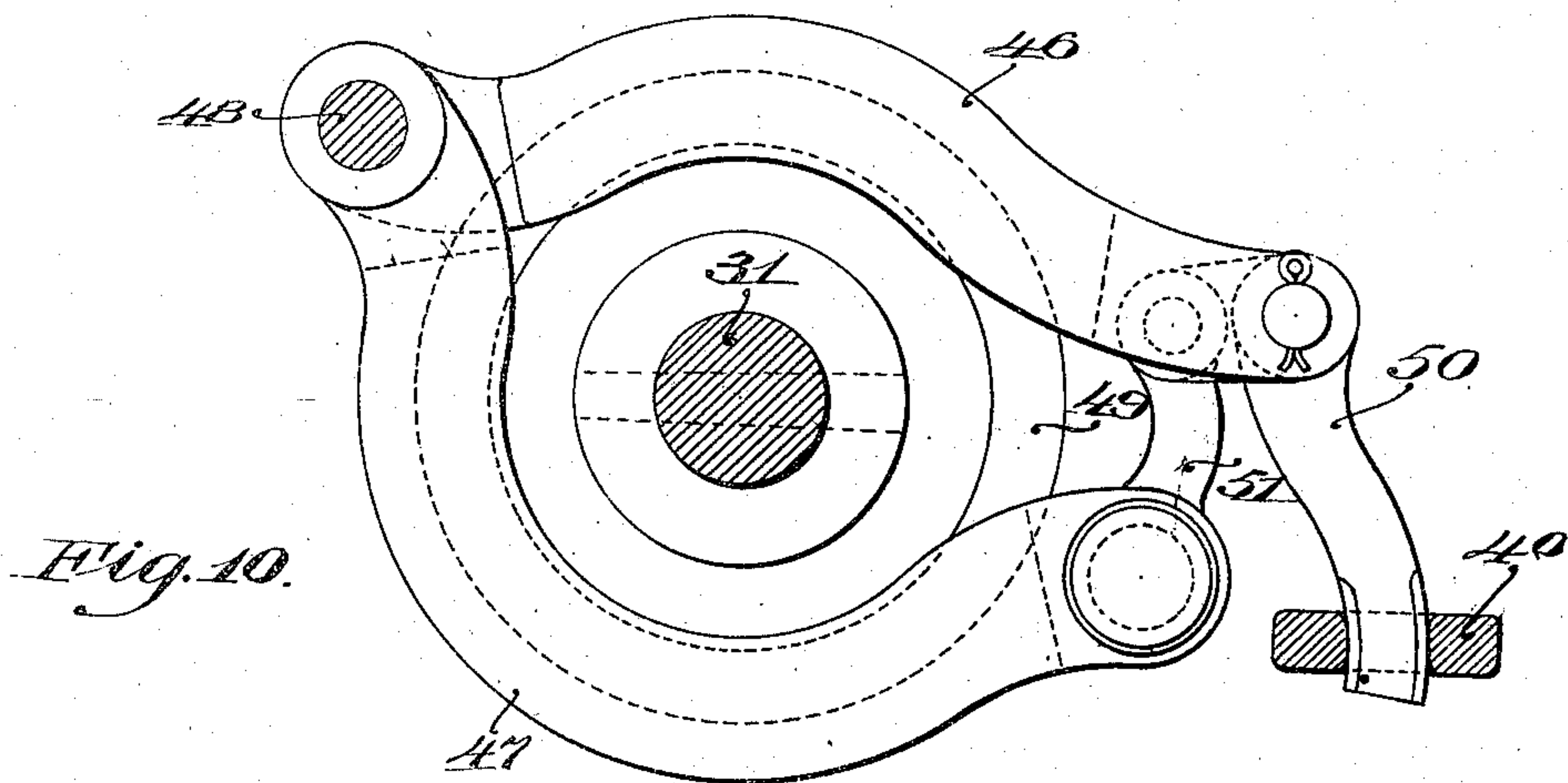
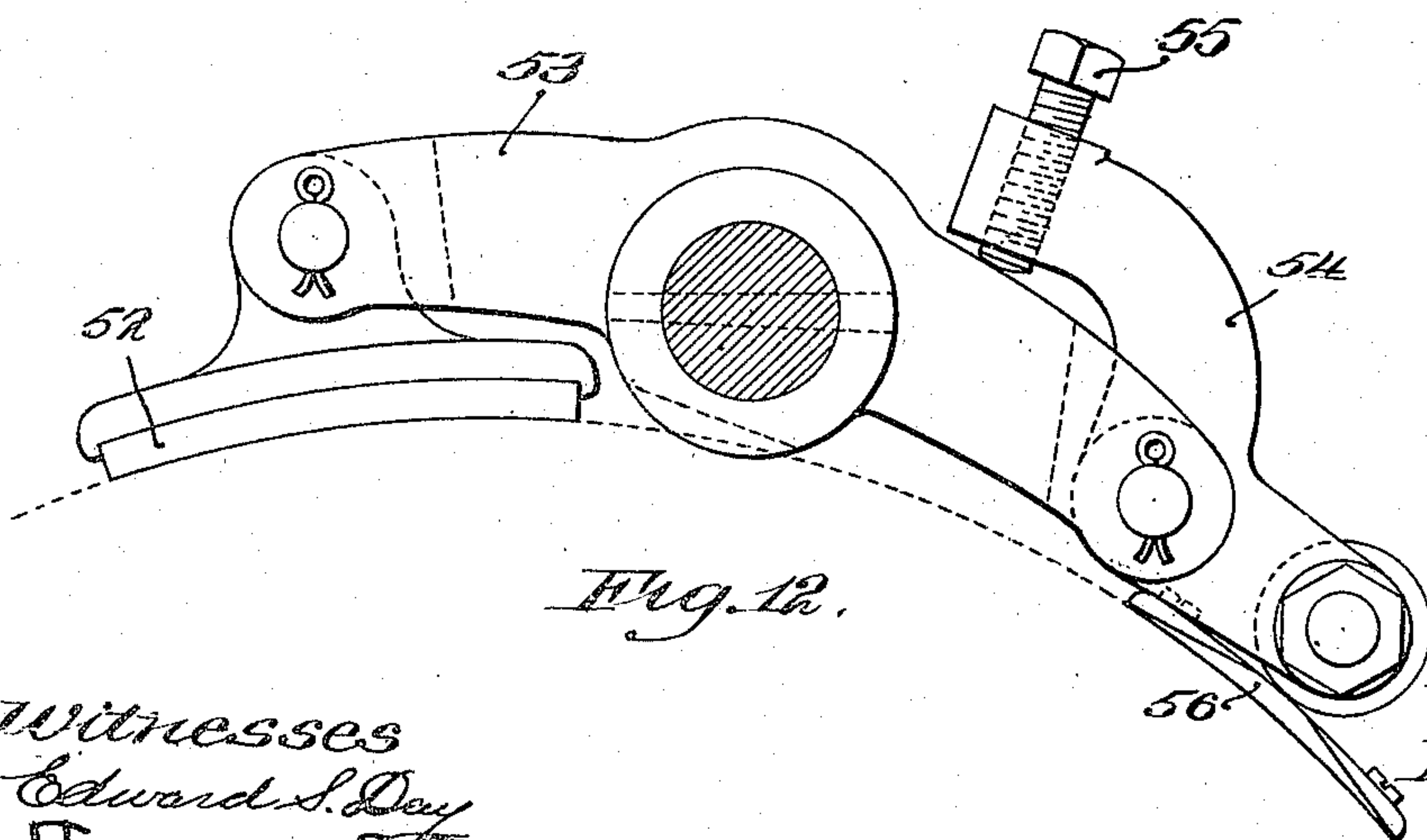


Fig. 11.



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UNITED STATES PATENT OFFICE.

BENJAMIN F. MAYO, OF SALEM, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SOLE-PRESSING MACHINE.

No. 881,478.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed March 10, 1906. Serial No. 305,230.

To all whom it may concern:

Be it known that I, BENJAMIN F. MAYO, a citizen of the United States, residing at Salem, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Sole-Pressing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to sole pressing machines which are used in the manufacture of boots and shoes to perform the operation of sole laying and sole leveling.

The invention is intended primarily as an improvement on the direct pressure sole pressing machine disclosed in United States Patent No. 818,504, granted to Erastus E. Winkley, April 24, 1906, the objects of the invention being to render the machine more certain and efficient in operation, to prevent undue strain and wear on the working parts when the machine is thrown into and out of operation, and to simplify and improve the construction, arrangement and mode of operation of certain parts of the machine.

With these objects in view the invention consists in the devices, combinations and arrangements of parts hereinafter described and claimed, the advantages of which will be obvious to those skilled in the art from the following description.

The several features of the present invention will be clearly understood from an inspection of the accompanying drawings, in which

Figure 1 is a view in side elevation of a sole leveling machine embodying the same in their preferred form; Fig. 2 is a view in rear elevation of the machine illustrated in Fig. 1 with certain of the parts omitted to avoid confusing the drawings; Fig. 3 is a sectional plan view illustrating the mechanism in the lower portion of the machine frame by which the cam shaft is thrown into and out of operation; Fig. 4 is a sectional view of the mechanism illustrated in Fig. 3, taken on the line 4--4 of said figure; Figs. 5 and 6 are detail views in side and rear elevation of a portion of the mechanism by which the timing mechanism is adjusted to vary the time during which the jack and form are held under pressure; Fig. 7 is a detail view in side elevation of a portion of the clutch actuating mechanism

and of the timing mechanism which acts on the clutch actuating mechanism when a jack and form are in a position of pressure to cause the clutch actuating mechanism to throw the cam shaft into operation; Fig. 8 is a detail plan view of a portion of the timing and clutch actuating mechanism; Fig. 9 is a view in rear elevation of the mechanism illustrated in Fig. 8; Fig. 10 is a detail view of the friction brake on the main driving shaft; and Figs. 11 and 12 are views in plan and side elevation respectively of a brake shoe and its actuating mechanism which acts upon a disk on the cam shaft when the cam shaft is stopped with a jack and form in a position of pressure.

The machine illustrated in the drawings is provided with two shoe supporting jacks and with two coöperating sole pressing forms, the jacks being indicated at 1, and the forms at 2. Each jack is constructed to receive a shoe supporting last or follower 3, and is mounted to reciprocate in a horizontal guideway formed in the upper portion of a table 4 mounted to reciprocate vertically in guideways on the main frame of the machine. Each jack is reciprocated on the table 4 to bring it from a position of presentation at the front of the machine, in which position a shoe can be readily removed from a jack and another shoe placed thereon, to a position directly beneath its coöperating form and to return it to its position of presentation after the pressing operation. The jacks are reciprocated on the table 4 by means of levers 5 pivoted at their lower ends to brackets projecting from the lower end of the slide which carries the table 4 and connected at their upper ends to the jacks by means of links 6, a lever and link being provided for each jack and the levers being mounted to move independently of each other so that one jack can remain in a position of presentation while the other jack is being moved into a position to coöperate with a sole pressing form and returned to its position of presentation. The levers 5 are oscillated by means of links or latches 7 provided with slots 8 in their forward ends adapted to engage studs on the levers and pivotally connected at their rear ends to a lever 9 pivoted upon the frame of the machine and provided with a cam roll engaging a cam on a cam shaft 10. Both latches 7 are connected to the lever 9 so that they move in unison, and in order to permit

either jack to be moved while the other jack remains in its position of presentation, vertical rods 11 are mounted to reciprocate in guideways on the slide which carries the table 4 and are provided with sleeves 12 having projections extending beneath the latches 7. A rod 11 is provided for each latch and the rods are held normally in a position in which the latches 7 are disconnected from the levers 5 by means of springs 13 coiled around the rods and interposed between the lower bearings for the rods and the sleeves 12. At their lower ends the rods are provided with arms 14 projecting beneath treadles 15 pivoted in the lower portion of the machine frame and acting when depressed to throw the cam shaft into operation as will be hereinafter described. A treadle 15 is provided on each side of the machine, and a depression of a treadle acts to depress the rod 11 on the same side of the machine and permit the latch 7 on that side of the machine to engage a lever 5. The rod 11 on the other side of the machine, however, is not actuated, and during the revolution of the cam shaft but one only of the jacks is reciprocated on the table 4.

The requisite amount of pressure to level the sole of a shoe supported upon a jack is produced by the upward movement of the table 4 when the jack is in position beneath its operating form. The table 4 is actuated at the proper times during the operation of the machine by mechanism comprising a cam on the cam shaft 10, a toggle lever 16, and a link 17, connecting the toggle lever and cam.

To automatically regulate the amount of pressure applied to the sole of a shoe and thus adapt the machine for operation upon a shoe regardless of the thickness of the sole or the height of the last, the forms 2 are mounted upon a cross-head 17 and mechanism is provided for permitting the cross-head to descend until a form is seated upon the sole of a shoe, for locking the cross-head in position during the upward movement of the table 4 and for raising the cross-head after the sole of the shoe has been leveled. The forms 2 are removably secured to form carriers 18, being held in position thereon by means of locking pins 19 mounted in the form carriers and engaging holes in the straps secured to the forms, and the form carriers are supported from the cross-head 17 so as to be capable of a slight rocking movement, as is common in this class of machines. The mechanism for permitting the cross-head 17 to descend and seat a form upon the sole of a shoe and for raising the cross-head after the sole of a shoe has been leveled, comprises a cam on the cam shaft 10, a lever 20 pivoted at its rear end to the frame of the machine and provided at its forward end with a roll bearing against the cam and a link 21 connecting the front end of the lever and the cross-head.

For locking the cross-head 17 in position during the upward movement of the table 4, locking cams 22 are provided secured to a rock shaft 23 mounted in the frame of the machine above the cross-head 17, which cams are adapted to be swung inwardly over the cross-head until they contact therewith and to be swung outwardly to allow the cross-head to be raised. The cams 22 are swung inwardly by the force of a spring 23*, see Fig. 2, connected to a lever 24 and are swung outwardly by mechanism comprising a cam on the cam shaft 10, the lever 24 pivotally mounted at its rear end upon the frame of the machine and provided at its forward end with a roll engaging the cam, and a link 25 connecting the forward end of the lever 24 to an arm 26 secured to the rock shaft 23 and projecting rearwardly therefrom.

Except for slight changes in the shape and arrangement of certain of the parts, the mechanism so far described is constructed and arranged to operate in the same manner as the corresponding mechanism of the machine described in the patent hereinbefore referred to. In the machine disclosed in said patent the cam shaft is driven by means of a worm meshing with a worm wheel secured to the shaft and this construction is retained in the machine illustrated in the drawings accompanying this application, the worm wheel being indicated at 27 and the worm at 28. Also as in the machine of the patent, the worm 28 is mounted upon a shaft 29 which is driven through spiral gears 30 from a driving shaft 31 journaled in the rear portion of the frame of the machine below and parallel with the cam shaft. In the machine of the patent the driving shaft 31 and the shaft 29 are rotated constantly, the worm 28 being loosely mounted upon the shaft 29 and a positively acting clutch being provided for connecting the worm and the shaft to start and stop the cam shaft. A clutch actuating mechanism is provided for actuating the clutch to stop the cam shaft with a jack and form in a position of pressure, and a timing mechanism is also provided which acts on the clutch actuating mechanism to cause said mechanism to start the cam shaft after the jack and form have remained in a position of pressure for a predetermined length of time, this timing mechanism being driven from the shaft 29. In embodying the various features of the present invention in the machine of said patent, the worm 28 has been rigidly secured to the shaft 29 and a friction clutch has been provided between the driven pulley and the driving shaft 31. Also a clutch actuating mechanism has been provided for actuating the friction clutch to disconnect the driving shaft and pulley when a jack and form are in a position of pressure, and a timing mechanism driven from the pul-

ley which acts on the clutch actuating mechanism to cause said mechanism to connect the driving shaft and pulley after the jack and form have been held in a position of pressure for a predetermined length of time. By the provision of a friction clutch between the driving shaft and the driving pulley, and of a timing mechanism which is driven from the pulley, the machine can be thrown into and out of operation without subjecting the working parts to injurious strains or shocks, and the machine can be operated in a more certain and efficient manner.

To insure the stopping of the driving shaft as soon as the driving pulley is disconnected therefrom, a brake is preferably applied thereto, and in the construction illustrated in the drawings this brake is connected to the clutch actuating mechanism so as to be actuated simultaneously with the friction clutch.

It is desirable that the rotation of the cam shaft be stopped when the table 4 is at the limit of its upward movement, and in order to secure this result and prevent any forward rotation of the cam shaft after the driving pulley has been disconnected from the driving shaft, the machine illustrated in the drawings is provided with a brake arranged to engage a disk on the cam shaft, and with mechanism for actuating the brake to stop the rotation of the cam shaft when the jack and form are in a position of pressure.

The driving pulley is indicated at 32 and is mounted to rotate loosely upon the driving shaft. The friction clutch consists of two members, one of which is formed on the pulley and the other of which is rigidly secured to the driving shaft so as to rotate therewith. The clutch member which is secured to the driving shaft is indicated at 33. To connect and disconnect the driving shaft and pulley, the pulley is moved longitudinally on the shaft. The clutch actuating mechanism for moving the pulley comprises a cam 34 secured to the cam shaft 10 outside of the worm gear 27, a sleeve 35 provided with an upwardly extending arm 36 and a downwardly extending arm 37, a rod 38 mounted to rock and move longitudinally in bearings supported from the frame of the machine, a spring 39 surrounding the rod 38 and interposed between the sleeve 35 and one of the bearings for the rod, a lever 40 pivotally mounted in the rear portion of the frame of the machine and connected at one end to the rear end of the rod 38 by means of pins projecting from the forked end of the lever into a grooved block 41 secured to the rod, an arm 42 rigidly connected to the lever 40, a lever 43 connected at one end to the hub of the driving pulley by means of pins projecting from its forked end into a groove in the hub, and a rod 44 connecting the other end of the lever 43 and the arm 42. The

parts of this mechanism, as will be apparent from an inspection of Figs. 1 and 3, are so arranged that the pulley is moved in a direction to disconnect the pulley and driving shaft by the action of the cam 34 and is moved in a direction to connect the driving shaft and pulley by the action of the spring 39. When the machine is at rest with both of the jacks at the front of the machine in their position of presentation, the parts of the clutch actuating mechanism are in the position illustrated in Figs. 1 and 3, the arm 36 of the sleeve 35 being engaged by one of the projections on the cam 34, and the rod 38 being held in the position to which it has been moved by the cam against the force of the spring 39. To start the machine the arm 36 is swung inwardly by means to be hereinafter described, and is thereby moved out of engagement with the projection on the cam 34. As soon as the arm 36 moves out of engagement with the projection on the cam 34, the rod 38 is moved to the left by the spring 39 and through the connections above described the driving pulley 32 is moved into engagement with the clutch member 33. The driving pulley remains in engagement with the clutch member 33 until the cam shaft 10 has made one-half of a revolution, at which time the other projection on the cam engages the arm 36, and the rod 38 is returned to the position indicated in Fig. 1, thereby moving the driving pulley out of engagement with the clutch member 33. The arm 36, after being moved inwardly out of engagement with a projection on the cam 34, is returned into the path of movement of the other projection by means of a spring 45 acting on the lower end of the arm 37, as best shown in Fig. 9.

The brake for stopping the rotation of the driving shaft as soon as the driving pulley is disconnected therefrom, is illustrated in detail in Fig. 10, and comprises two brake shoes 46 and 47 pivotally mounted upon a fixed stud 48 and arranged to nearly surround a disk 49 secured to the driving shaft. At the opposite side of the driving shaft from the stud 48 the brake shoe 46 is provided with a bell crank lever 50 pivotally mounted thereon, and the short horizontal arm of this bell crank is connected by link 51 to the brake shoe 47. The long vertical arm of the bell crank 50 projects through a slot in the short arm of the lever 40 so that the bell crank 50 is oscillated whenever the lever 40 is oscillated. It will be apparent from an inspection of Figs. 3 and 10 that the bell crank 50 is oscillated to cause the brake shoes 46 and 47 to engage the disk 49 when the clutch actuating mechanism is actuated to disconnect the driving pulley from the driving shaft, and that the bell crank 50 is oscillated to move the brake shoes 46 and 47 out of engagement with the disk 49 when

the clutch actuating mechanism is actuated to connect the driving pulley and driving shaft.

The brake for insuring the stopping of the 5 cam shaft with the jack and form in a position of pressure, is illustrated in detail in Figs. 11 and 12, and, as shown in these figures, comprises a brake shoe 52 pivotally 10 mounted upon the forward end of a lever 53 and arranged to engage the peripheral surface of one of the cam disks on the cam shaft. Upon the rear end of the lever 53 is pivotally 15 mounted a lever 54, the forward end of which is provided with an adjusting screw 55 which bears against the lever 53, and the 20 rear end of which is provided with a roller arranged in the path of movement of a projection 56 on the cam disk. The projection 56 is so located on the cam disk that the 25 brake shoe is caused to engage the disk when the jack and form are brought into a position of pressure and the driving pulley is disconnected from the driving shaft. By means of the screw 55 the pressure of the brake shoe 30 upon the disk can be regulated as desired.

The projections on the cam 34 of the clutch 35 actuating mechanism are so located that the driving pulley is disconnected from the driving shaft when a jack and form are in a position of pressure, and against when the jack 30 has been returned to its position of presentation. As has been stated, the arm 36 is moved inwardly out of engagement with the cam 34 by the operator in order to connect 35 the driving shaft and pulley when both jacks are in a position of presentation. When a jack and form is under pressure the arm 36 is also moved inwardly to connect the driving shaft and pulley, but this movement of 40 the arm is produced automatically by means of a timing mechanism driven from the driving pulley. This timing mechanism is best illustrated in Figs. 3, 4, 8 and 9. Referring to these figures, 57 indicates a spiral cam or 45 worm secured to a shaft 58 journaled in the lower portion of the machine frame and constantly rotated from the pulley 32 by means of a chain passing over sprocket wheels 59 and 60 secured respectively to the hub of the 50 pulley and a short shaft 61, spiral gears 62 connecting the shaft 61 and a shaft 63, and bevel gears 64 connecting the shaft 63 and the shaft 58. Parallel to the shaft 58 a rod 65 is mounted in the frame of the machine so 55 as to be capable of moving longitudinally, and upon this rod is pivotally mounted a tripper in the form of a lever 66, the inner end of which is provided with a series of teeth 67 adapted to mesh with the worm 57 60 and the outer end of which is provided with a notch 68 through which the lower end of the arm 37 of the clutch actuating mechanism projects. The tripper 66 is acted upon by a coiled spring 69 which tends to hold 65 the teeth 67 in mesh with the worm 57.

Normally, the tripper is held in a position in which the teeth 67 are out of engagement with the worm 57 by means of a latch 70, the lower end of which is held in engagement 70 with a projection 71 on the tripper by means of a spring 72 acting on the upper end of the latch. Upon the worm gear 27 an arm 73 is 75 secured (see Figs. 1 and 2) and this projection is so arranged that it comes into engagement with the upper end of the latch 70 and moves the latch to release the tripper 66 just before 75 or at the time that the cam shaft is stopped with the jack and form in a position of pressure. As soon as the tripper 66 is released it is moved by the spring 69 to bring the 80 teeth 67 into engagement with the worm 57, and while the teeth remain in engagement with the worm the rod 65 is moved longitudinally and the outer end of the tripper 66 bearing against the arm 37 of the clutch 85 actuating mechanism moves this arm outwardly and the arm 36 inwardly until the arm 36 is removed from engagement with the cam 34 and the clutch actuating mechanism acts to connect the driving shaft and pulley. 90 When the clutch actuating mechanism thus acts, the rod 38 and the arms 36 and 37 carried thereby move toward the left as viewed in Figs. 1 and 8, and the arm 37 acts on the 95 tripper 66 to swing it about its pivot to a position in which the teeth 67 are out of engagement with the worm 57, in which position it is locked by the latch 70. As soon as the tripper is disconnected from the worm 57, 100 the rod 65 is returned to its initial position by the action of the spring 45.

It will be evident that the initial position of the rod 65 determines the length of time during which the cam shaft remains at rest with the jack and form under pressure. To 105 enable this time to be varied as desired an adjustable stop 74 is provided, which is arranged in the path of movement of an arm 75 secured to the rod 65. The stop 74 is mounted upon the shaft 58 and upon a shaft 110 76 which forms the pivotal support for the starting treadles 15, and to enable the stop to be conveniently adjusted by the operator it is connected by means of a rod 77 to the 115 lower end of an arm 78 secured to a short rock shaft 79 to which rock shaft an adjusting lever 80 is secured. The adjusting lever 80 is located at the front of the machine in convenient position to be grasped by the 120 operator, and is provided at its upper end with a locking pin 81 which coöperates with a series of holes in an indicator plate 82 to lock the stop 74 in adjusted position.

From an inspection of Figs. 1, 3 and 8 it will be seen that the tripper 66 is so constructed and arranged that a movement of 125 the rod 65 longitudinally will move the arm 37 outwardly, and the arm 36 inwardly, whether or not the teeth 67 of the tripper are in engagement with the worm 57. The rod 130

65 and the tripper 66 can therefore be used to actuate the clutch actuating mechanism after the driving pulley has been disconnected from the driving shaft with both jacks in a position of presentation. The starting treadles of the machine illustrated in the drawings are accordingly shaped at their rear ends to cooperate with blocks 83 secured to the rod 65, the shape and arrangement of the rear ends of the treadles and the blocks being such that a depression of either treadle moves the rod 65 longitudinally a sufficient distance to throw the clutch actuating mechanism into operation.

15 The nature and scope of the present invention having been indicated, and a machine embodying the various features of the invention in their preferred form having been specifically described,

20 What is claimed is:

1. A sole pressing machine, having, in combination, a shoe supporting jack, a sole pressing form, a cam shaft and suitable connections for relatively actuating the jack and form to press the sole of a shoe supported upon the jack, a driving shaft and suitable connections for actuating the cam shaft, a constantly running pulley on the driving shaft, a friction clutch for connecting the pulley and driving shaft, mechanism for actuating the clutch to disconnect the driving shaft and pulley when the jack and form are in a position of pressure, and a timing mechanism driven from the pulley and acting on the clutch actuating mechanism to cause said mechanism to connect the driving shaft and pulley.

2. A sole pressing machine, having, in

combination, a shoe supporting jack, a sole pressing form, a cam shaft and suitable connections for relatively actuating the jack and form to press the sole of a shoe supported upon the jack, a driving shaft and suitable connections for actuating the cam shaft, a constantly running pulley on the driving shaft, a friction clutch for connecting the pulley and driving shaft, a brake for stopping the rotation of the driving shaft, mechanism for actuating the clutch to disconnect the driving shaft and pulley and for applying the brake when the jack and form are in a position of pressure, and a timing mechanism driven from the pulley and acting on the clutch and brake actuating mechanism to cause said mechanism to connect the driving shaft and pulley and to release the brake.

3. A sole pressing machine, having, in combination, a shoe supporting jack, a sole pressing form, a cam shaft and suitable connections for relatively actuating the jack and form to press the sole of a shoe supported upon the jack, means for actuating the cam shaft, a brake arranged to engage a disk on the cam shaft, means for disconnecting the cam shaft from its actuating means when the jack and form are in a position of pressure, and means for applying the brake to stop the rotation of the cam shaft with the jack and form in a position of pressure.

In testimony whereof I affix my signature, in presence of two witnesses.

BENJAMIN F. MAYO.

Witnesses:

FRED O. FISH,
FARNUM F. DORSEY.