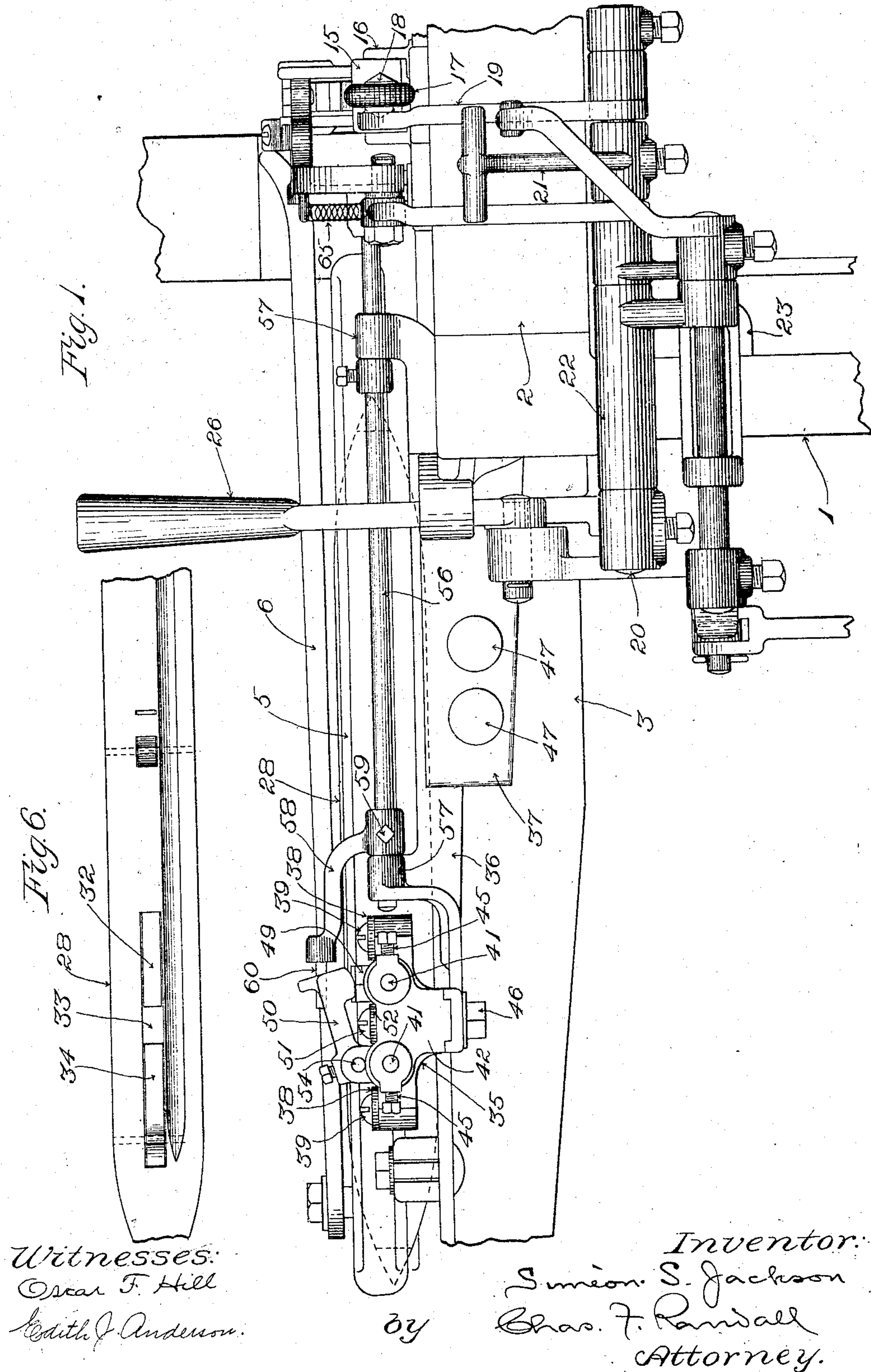


940,600.

S. S. JACKSON.
DIFFERENTIAL FILLING SUPPLY GAGING DEVICE FOR LOOMS.
APPLICATION FILED OCT. 22, 1908.

Patented Nov. 16, 1909.
4 SHEETS—SHEET 1.



Witnesses:
Oscar F. Hill
Edith J. Anderson.

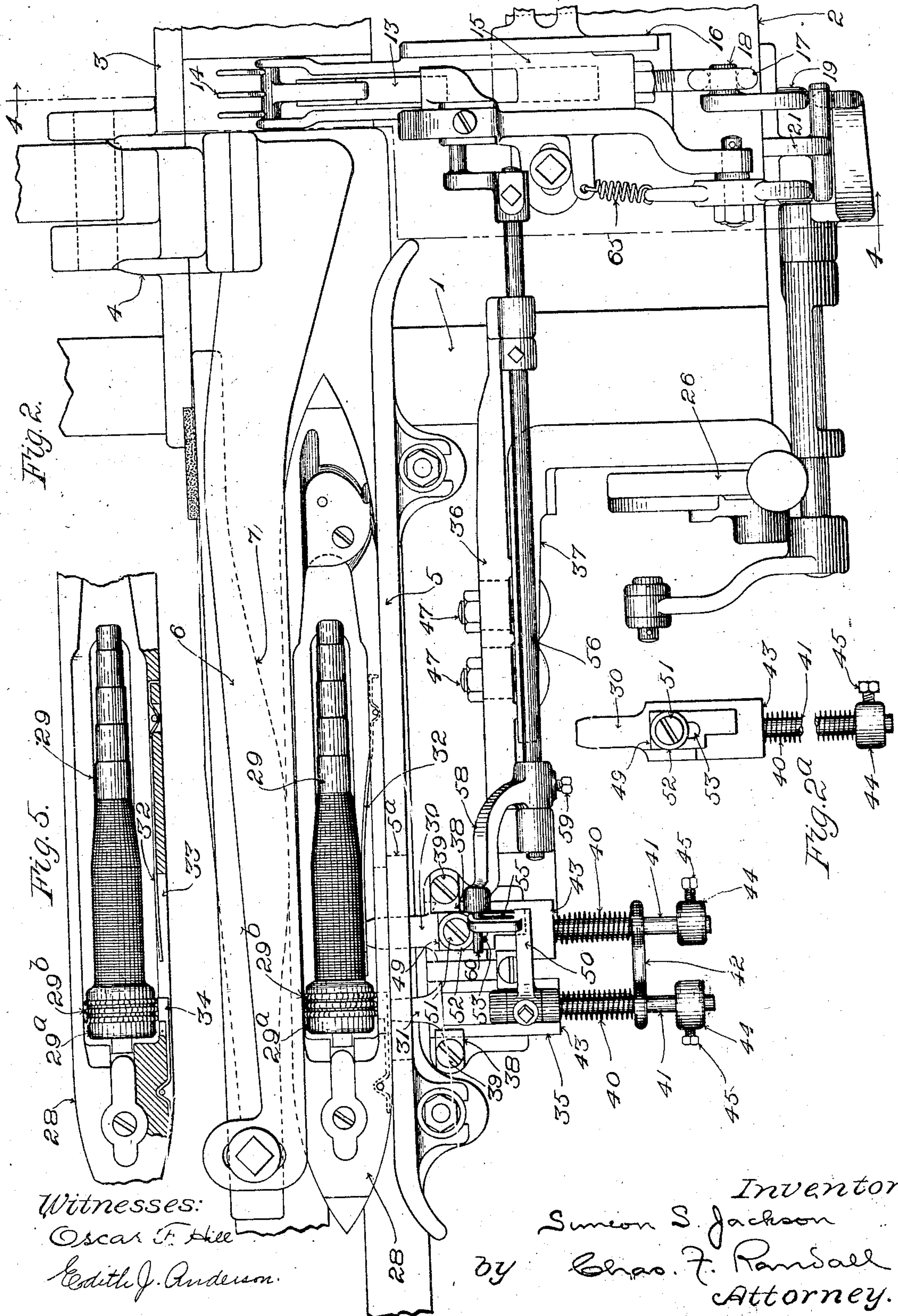
Inventor:
Simon S. Jackson
by
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

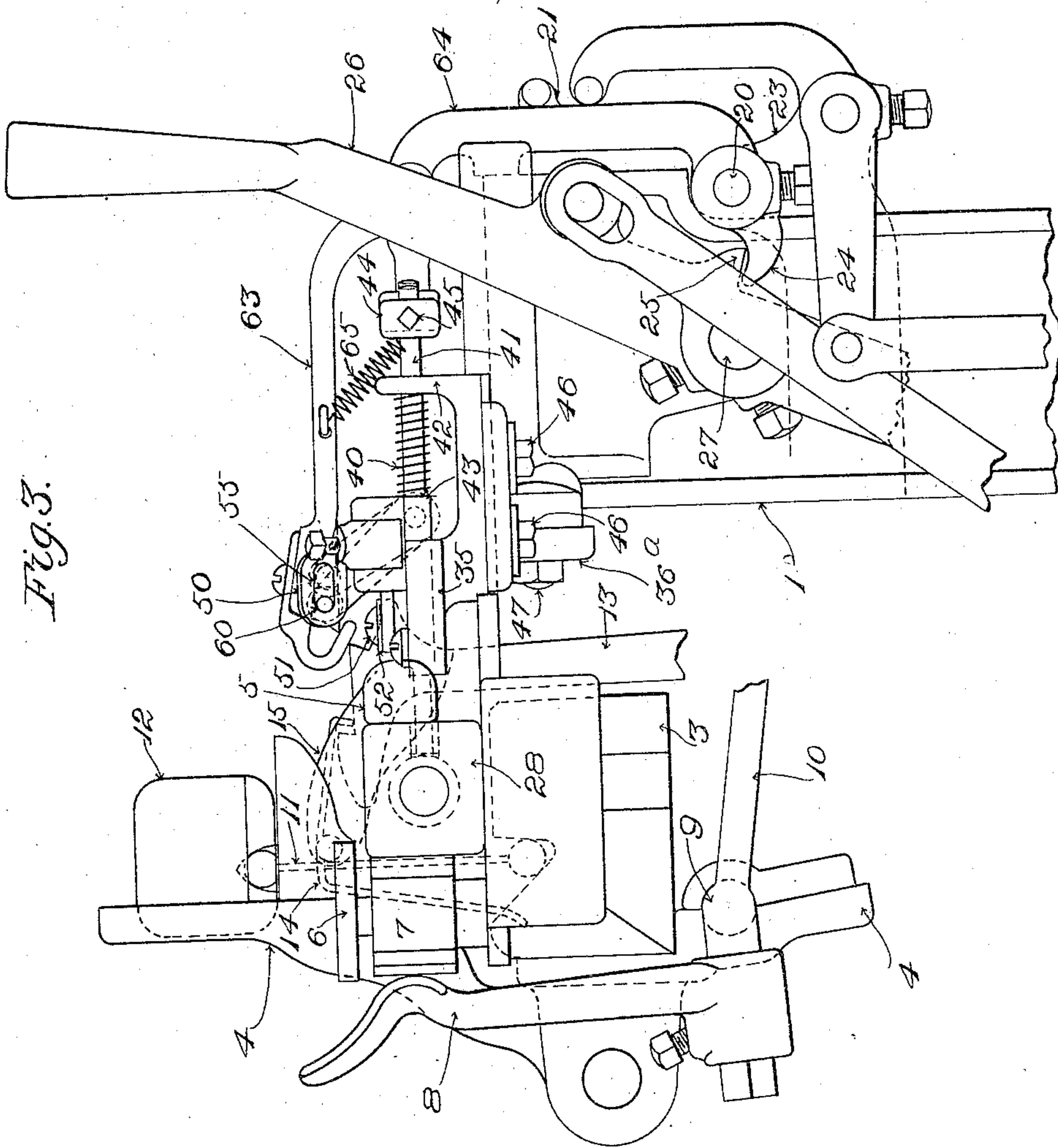


Fig. 3.

Witnesses:
Oscar F. Hill
Edith J. Anderson

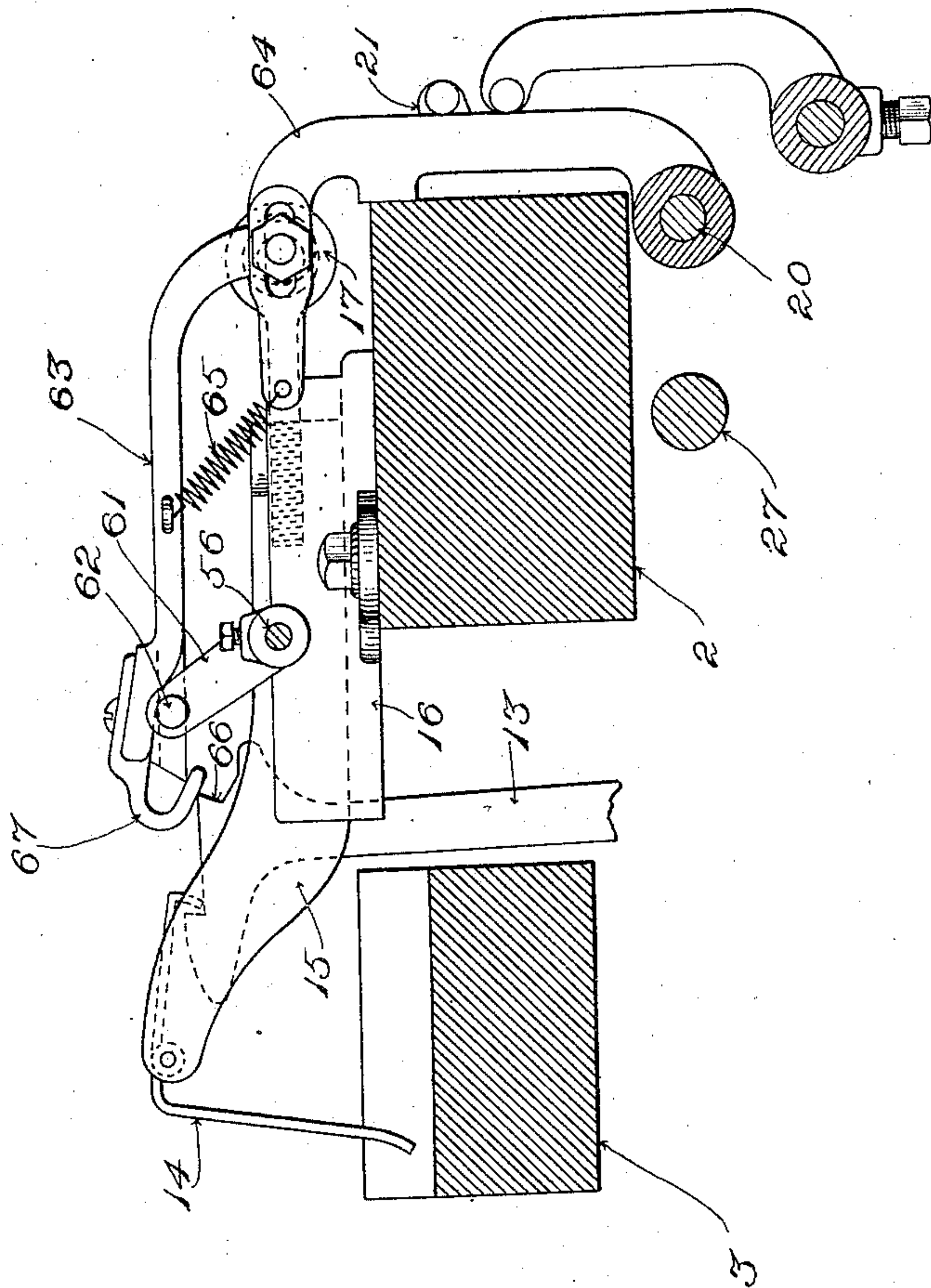
Inventor:
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4 SHEETS—SHEET 4.

Fig. 4.



Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

SIMEON SCHOON JACKSON, OF READVILLE, MASSACHUSETTS, ASSIGNOR TO THE STAFFORD COMPANY, OF READVILLE, MASSACHUSETTS, A CORPORATION OF NEW YORK.

DIFFERENTIAL FILLING-SUPPLY-GAGING DEVICE FOR LOOMS.

940,600.

Specification of Letters Patent.

Patented Nov. 16, 1909.

Application filed October 22, 1908. Serial No. 458,942.

To all whom it may concern:

Be it known that I, SIMEON SCHOON JACKSON, a subject of Great Britain, residing at Readville, in the county of Norfolk, State of Massachusetts, have invented a certain new and useful Improvement in Differential Filling-Supply-Gaging Devices for Looms, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention has relation to devices for indicating when the filling-supply within the shuttle at work upon the lay of a loom has become reduced to a predetermined amount short of complete exhaustion.

I employ, as heretofore has been proposed in some instances two independently-movable contact-members arranged to act each time the working shuttle occupies the corresponding shuttle-box of the lay, one thereof controlled as to its position by the size of the base-portion of the wound yarn-mass within the said shuttle, and the other having its position given to it from a datum-surface independent of the yarn-mass itself. The relative positions of the contact-members, each time they are brought into action, are fixed by the relation between the exterior of the base of the yarn-mass and the datum-surface. This relation continues unchanged until the yarn commences to weave off from the said base. As soon as it begins to vary as a result of decrease in the diameter of the said base, a variation results in the positions which the contact-members are given with relation to each other when next called into action, which variation proceeds as the yarn continues to weave off. In accordance with the invention, I employ a detent in connection with one of the said contact-members, and in connection with the other of the latter a latch which is governed by engagement with the said detent; and in connection with the latch I provide a controller, operatively engaging therewith and held in normal working position thereby, and released for action as a result of the release of the latch. The parts are so related that the latch normally is controlled by the detent, but when the supply of weft or filling remaining within the shuttle has been reduced to the predetermined extent the positions which are then assumed by the contact-members cause the latch to be freed from the restraint of the

detent. I make provision for adjustment to vary the time of the release of the latch to suit requirements in practice. The said controller is operatively combined with other parts in the loom to bring about the required result in the working thereof, which result may be a stoppage of the loom, or a replenishment of the filling-supply. I combine with the controller means for automatically resetting the same and the latch.

An embodiment of the invention is shown in the drawings, in which latter,—

Figure 1 is a front elevation of a portion of a loom with the said embodiment applied thereto. Fig. 2 is a plan view of the parts which are shown in Fig. 1. Fig. 2^a is a plan view of one of the contact-members and the detent connected therewith. Fig. 3 is an end elevation of the parts which are shown in Figs. 1 and 2. Fig. 4 is a view in vertical section in the plane indicated by line 4, 4, in Fig. 2. Fig. 5, Sheet 2, is a partly sectional plan of a portion of a loom shuttle. Fig. 6, Sheet 1, is a front elevation thereof.

In the drawings,—only the parts involving the invention, and such other parts as are more immediately associated therewith in a loom are shown.

Referring briefly, first, to the parts which are shown merely for the purpose of indicating the application and relations of the invention,—at 1 is a portion of one end-frame of a loom, 2 a portion of the breast-beam, 3 a portion of the lay-beam, 4 (Figs. 2 and 3) a portion of one of the lay-swords, 5 the front-plate of one of the shuttle-boxes on the lay, 6 the top of such shuttle-box, 7 (Figs. 2 and 3) a binder working at the rear of the shuttle-box, 8 (Fig. 3) a protector-finger cooperating with the said binder, 9 (Fig. 3) the protector-rockshaft mounted in a bearing on the said lay-sword, and 10 the dagger carried by the said protector-rockshaft.

11 (Fig. 3) is the reed mounted on the lay, 12 the lay-cap, 13 (Figs. 2, 3, 4) the vibrating weft-hammer or gooseneck, 14 the weft-fork, 15 the weft-fork slide, and 16 is the guide-case for the said slide, fixed upon the breast-beam.

At 17 (Figs. 1 and 2) is an eyed shackle projecting from the forward end of the weft-fork slide, and receiving in its eye a pin or stud 18 projecting laterally from an

upright arm 19 which is sleeved upon the knocking-off rockshaft 20 with capacity to turn thereon.

At 21 is an arm fixed upon the said rockshaft, with opposite projections, one of which extends across in front of the arm 19. The rockshaft 20 is mounted in a pipe-bearing 22 (Fig. 1) on a stand 23 attached to the end-frame 1, and is provided at its outer end with a knocking-off piece 24 (Fig. 3) adapted to engage with a projection 25 of the shipper-handle 26, the latter being fixed upon the supporting-shaft 27, which is mounted in bearings upon the loom-frame. When failure of weft permits the weft-hammer to engage the weft-fork and move the weft-fork slide forward, the forward turning movement of the arm 19 thereby occasioned causes such arm, by its engagement with the corresponding projection of arm 21, to move forward the arm 21 also, thereby turning the knocking-off rockshaft so as by its piece 24 to move the shipper-handle 26 to unship the driving-power.

At 28 is a shuttle, shown occupying the shuttle-box in Figs. 1, 2 and 3, and separately in Figs. 5 and 6, and at 29 is a bobbin in place within the body of such shuttle, such bobbin containing a supply of weft-yarn or filling, which is represented as having been partially woven off, 29^a being the head of the said bobbin, and 29^b metal rings upon the said head. As thus far mentioned, the parts themselves form no portion of the invention.

Referring, now, to the devices in which the invention resides, and the parts more immediately associated therewith,—at 30, 31, (see, more particularly, Fig. 2) are the contact-members. The acting portions thereof are arranged properly to enable the member 30 to be governed by or through the base-portion of the wound mass of weft-yarn or filling within the shuttle, and the member 31 by or through the datum-surface aforesaid. In the form of the invention that is here shown the contact-member 30 is controlled indirectly by the said base-portion through a feeler 32 (Figs. 5 and 6) which is movably mounted on the shuttle, and with which the contact-member engages, the said feeler, in its turn, being arranged to press against the surface of the said base-portion of the yarn-mass. In Figs. 2, 5 and 6 the feeler consists of a strip of elastic material, as steel, secured by one end to the shuttle-body, the acting portion of such strip extending lengthwise of the shuttle within the latter, toward the end of the shuttle-cavity at which the bobbin-head is located. A longitudinal slot 33 formed in the front wall of the shuttle-body permits the acting portion of the contact-member 30 to engage the feeler. In this form of the invention, also, the datum-surface is constituted by the front surface of a movable piece, 34, work-

ing in the slot 33 and adapted to engage with the periphery of the bobbin-head 29^a, or with the peripheries of the rings 29^b upon the bobbin-head. The said piece 34 has an elastic extension by which it is attached to the shuttle-body, as shown in Figs. 5 and 6.

A slot or opening 5^a, shown by dotted lines in Fig. 2, is made through the front-plate 5 of the shuttle-box to admit the acting-portions of the contact-members and allow them to engage with the feeler 32 and piece 34 carried by the shuttle. The contact-members are, in this form of the invention, constituted by slides which are fitted to guideways provided in a support 35 on the outer end of a stand 36 carried by a fixed bracket 37 projecting outward from the end of the loom. The slides are movable in the said guideways forward and backward in the loom. They are kept in the guideways by means of gibs 38, 38, (see, more particularly, Fig. 2) that are secured in place upon the support 35 by screws 39, 39, entering the said support, the construction enabling the slides conveniently to be removed and replaced. The acting portions of the contact-members are at the rear ends of the latter and they are so located that when the lay beats up the feeler and the movable piece 34 carried by the shuttle will act against the said acting portions so as to move the slides forward in the guideways. The slides are backed up by springs 40, 40, shown as expanding spiral springs surrounding cylindrical pins 41, 41, projecting forwardly from the slides and passing through guide-eyes in a forward extension 42 of the support. The said springs are compressed between the guide-eyes and shoulders which are provided upon the slides at 43, 43, and they act with a tendency to press the slides rearward, and to keep them in their normal positions, which latter are determined through the engagement of stop-collars 44, 44, carried by the pins 36, 36, with the front surface of the said extension 42. The said normal position may be adjusted by shifting the positions of the stop-collars upon the said pins. To permit this adjustment, the stop-collars are secured in place by means of the clamping-screws 45, 45. The contact-members may be adjusted independently of each other. Support 35 is fitted to ways with which the outer end of stand 36 is provided, and is adjustable in the direction from front to rear, being secured in the desired position of adjustment by means of screws 46, 46, working through slots in the horizontal portion of the stand 36, Figs. 1 and 3. This capacity for adjustment enables the support to be set forward or back, to give it the correct position with reference to the forward limit of the stroke of the lay. The said stand is adjustable transversely of the loom, to enable the contact-

members to be located in proper position to cooperate with the feeler 32 and piece 34 when the shuttle is at rest within the shuttle-box at the end of its flight, the stand being secured to the bracket 37 by means of bolts and nuts 47, 47, the stems of such bolts passing through transversely-elongated slots 48, 48, shown by dotted lines in Fig. 1, in a depending portion 36^a (Fig. 3) of the said stand.

A detent is shown at 49 (Figs. 2 and 2^a) and a latch at 50. The said detent is mounted upon the contact-member 30 and is movable therewith. It consists of a block which is secured in place upon the said contact-member by a screw 51 and washer 52, the stem of the said screw passing through a slot 53 in the said block that is elongated in the direction from front to rear. The said slot provides for adjustment of the detent upon the contact-member 30 in such direction. The latch is pivotally mounted at 54 (Fig. 1) upon the contact-member 31, and rests upon the detent. It is formed with a slot 55 (Figs. 2 and 3) elongated in the direction from front to rear.

The controller herein shown is constructed with a horizontal supporting-shaft 56 extending transversely of the loom and mounted in bearings 57, 57, upon the stand 36, and with an arm 58 sleeved upon the said supporting-shaft and fixed thereon with capacity for angular adjustment around the same by means of a clamping-screw 59. The said arm carries a pin 60 which works in the slot 55 of the latch. Through the engagement of the said pin in the said slot the latch and controller are operatively connected so that when the latch is raised it uplifts the arm 58, turning the controller, and so long as the latch is held up by the detent the arm is held uplifted and the controller is kept locked in the position which was given to it. The elongation of the slot 55 permits the latch to reciprocate forward and rearward with the contact-member with which it is connected, without interfering with the inter-engagement of the latch and controller.

Each time the lay beats up the contact-members are both pushed forward in unison, and as the lay recedes they are caused to follow back to their normal positions by the action of their springs 40, 40. During these movements they take the detent and latch with them, and the latch remains resting upon the detent, and the controller locked, so long as there is a sufficient amount of yarn or filling in the base-portion of the yarn-mass within the shuttle to act to keep the detent in engagement with the latch. When the yarn begins to weave off from the base of the yarn-mass, so that the diameter thereof grows smaller, the forward movement given to the contact-member 30 and the de-

tent is less than with the base of its full diameter, while that of contact-member 31 and the latch remain the same in extent as before. The difference in the distances which the detent and latch, respectively, are carried forward by the beat-up of the lay will increase progressively as the base-portion of the yarn-mass lessens in diameter, until finally, when the amount of yarn remaining within the shuttle has been reduced to the limit deemed advisable, the detent will remain behind to a sufficient extent to permit the latch to pass forward off the front end of the detent. Thereupon, the latch will be released from restraint and the controller will be permitted to turn, bringing about the change in the working of the loom for which provision has been made in the construction of the latter. By adjustment of the detent forward or back upon the contact-member 30, so as to alter the position of the detent relative to the latch, the stage in the unwinding of the weft-yarn or filling at which the release of the latch takes place may be regulated, so that such release may take place earlier or later. This enables me to set the parts to act with close exactness when any desired amount of yarn or filling still remains within the shuttle.

The devices through which the controller acts to bring about the desired change in the working of the loom may vary according to circumstances. Herein, the controller rock-shaft 56 has fixed upon its inner end an arm 61 carrying a pin 62 on which rests a dog 63. The latter overhangs by its rear end the path of the head of the goose-neck or weft-hammer 13, and is pivotally connected at its forward end to an arm 64 which is sleeved upon the knocking-off rockshaft 20 and capable of turning upon the latter. The dog is acted upon by a contracting spiral spring 65 having one end thereof engaged with the dog and the other with the upper end of arm 61, as shown in Fig. 4. The said spring tends to depress the dog, and acts through the pressure of the dog upon the pin 62 with a tendency to turn the controller. This tendency is opposed through the engagement of the controller with the latch, and of the latch with the detent. When the latch is freed from the restraint of the detent in consequence of exhaustion of the supply of weft or filling in the shuttle to the predetermined extent, the controller turns, permitting the dog to swing so as to carry its rear end into the path of a shoulder 66 (Fig. 4) on the goose-neck or weft-hammer. Then, as the latter goes forward, the said shoulder engages the dog and pushes it forward, swinging the arm 64 in the same direction so that it acts against one of the transverse projections of arm 21 upon the knocking-off rock-

shaft 20. Thereby the said rockshaft is turned so as by its projection 24 to operate the shipper-handle 26.

For the purpose of automatically resetting the devices for continued operation, I provide means for automatically raising the latch and replacing it in engagement with the top of the detent. To this end I furnish the rear end of dog 63 with a hook 67. As the gooseneck or weft-hammer pushes the dog forward in the manner just stated, the dog slides upon the pin 62 until such hook engages with the pin. By such engagement the arm 61 and controller are turned by the remainder of the advancing movement of the dog with the gooseneck or weft-hammer. By the turning movement of the controller thus occasioned the latch is raised from in front of the detent, whereupon the contact-member 31 will be forced rearward by its spring 40 until arrested by engagement of its stop-collar 44 with its guide-eye at 42. This movement of the contact-member 31 will carry the latch on top of the detent, thus replacing it in normal engagement with the detent again, in readiness for the continued working of the parts as before. In addition, the upwardly-extending curved path taken by the pin 62 as arm 61 and the controller are swung in the manner described will raise the rear end of the dog 63 so as to disengage it from the shoulder 66 of the gooseneck or weft-hammer and keep it out of the path of such shoulder. Thereafter, when the arm 64 and dog 63 are caused to move rearward into their normal position, the said end of the dog will be held clear of the shoulder.

What I claim is:—

1. In filling-supply gaging devices for looms, the combination with two independently-movable contact-members, of a detent connected with one thereof, a latch movably connected with the other thereof and governed as to effective movement by engagement with the said detent, the latter preventing such movement until the predetermined extent of relative shift has occurred, means to relatively adjust the detent and latch to vary the said extent, and a controller governed by the latch and permitted to act by the said effective movement.

2. In filling-supply gaging devices for looms, the combination with two independently-movable contact-members, of a detent connected with one thereof, a latch movably mounted upon the other thereof and normally held in restraint by the said detent, and a controller operatively engaged normally with the said latch and thereby itself controlled, and released for action as a result of the release of the latch.

3. In filling-supply gaging devices for looms, the combination with two independently-movable contact-members, of a detent connected with one thereof, a latch movably

mounted upon the other thereof and normally held in restraint by the said detent, a controller operatively engaged normally with the said latch and thereby itself controlled, and released for action as a result of the release of the latch, and means for automatically resetting the parts.

4. In filling-supply gaging devices for looms, the combination with two independently-movable sliding contact-members, a detent connected with one thereof, a pivoted latch connected with the other thereof and normally held in restraint by the said detent until the predetermined extent of relative shift has occurred, and a controller restrained normally by the latch and released for action through the release of the latch, of means for automatically resetting the parts.

5. In filling-supply gaging devices for looms, the combination with two independently-movable contact-members, a detent connected with one thereof, a movable latch connected with the other and governed by engagement with the detent until the predetermined amount of relative shift has occurred, and a controller governed by the latch and released for action through the release of the latch, of a change-inducing dog controlled by the controller, a going-part of the loom adapted to engage with the said dog to bring about the contemplated change, and means in connection with said dog for resetting the latch.

6. In filling-supply gaging devices for looms, the combination with two independently-movable spring-actuated contact-members, a detent connected with one thereof, a movable latch connected with the other and governed by engagement with the detent until the predetermined amount of relative shift has occurred, and a controller in loose connection with the latch permitting the movement of the latter in unison with the corresponding contact-member, of change-inducing devices under the control of the said controller.

7. In filling-supply gaging devices for looms, the combination with two independently-movable spring-actuated contact-members, a detent connected with one thereof, a movable latch connected with the other and governed by engagement with the detent until the predetermined amount of relative shift has occurred, and a controller in loose connection with the latch permitting the movement of the latter in unison with the corresponding contact-member, of change-inducing devices under the control of the said controller including means acting through the controller to automatically reset the parts.

8. In filling-supply gaging devices for looms, the combination with independently-movable spring-actuated contact-members, a detent connected with one thereof, a movable

latch connected with the other and governed
by engagement with the detent until the pre-
determined amount of relative shift has oc-
curred, and a controller in pin-and-slot con-
5 nection with the latch permitting movement
of the latter in unison with the correspond-
ing contact-member, of a change-dog con-
trolled by the said controller, a going-part
adapted to engage and actuate the said

change-dog, and means through which the 10
change-dog acts to automatically reset the
parts.

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

SIMEON SCHOON JACKSON.

Witnesses:

CHAS. F. RANDALL,

EDITH J. ANDERSON.