

Nov. 18, 1924.

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R. G. TURNER

WEFT DETECTOR FOR LOOMS

Filed Jan. 5 1923

2 Sheets-Sheet 1

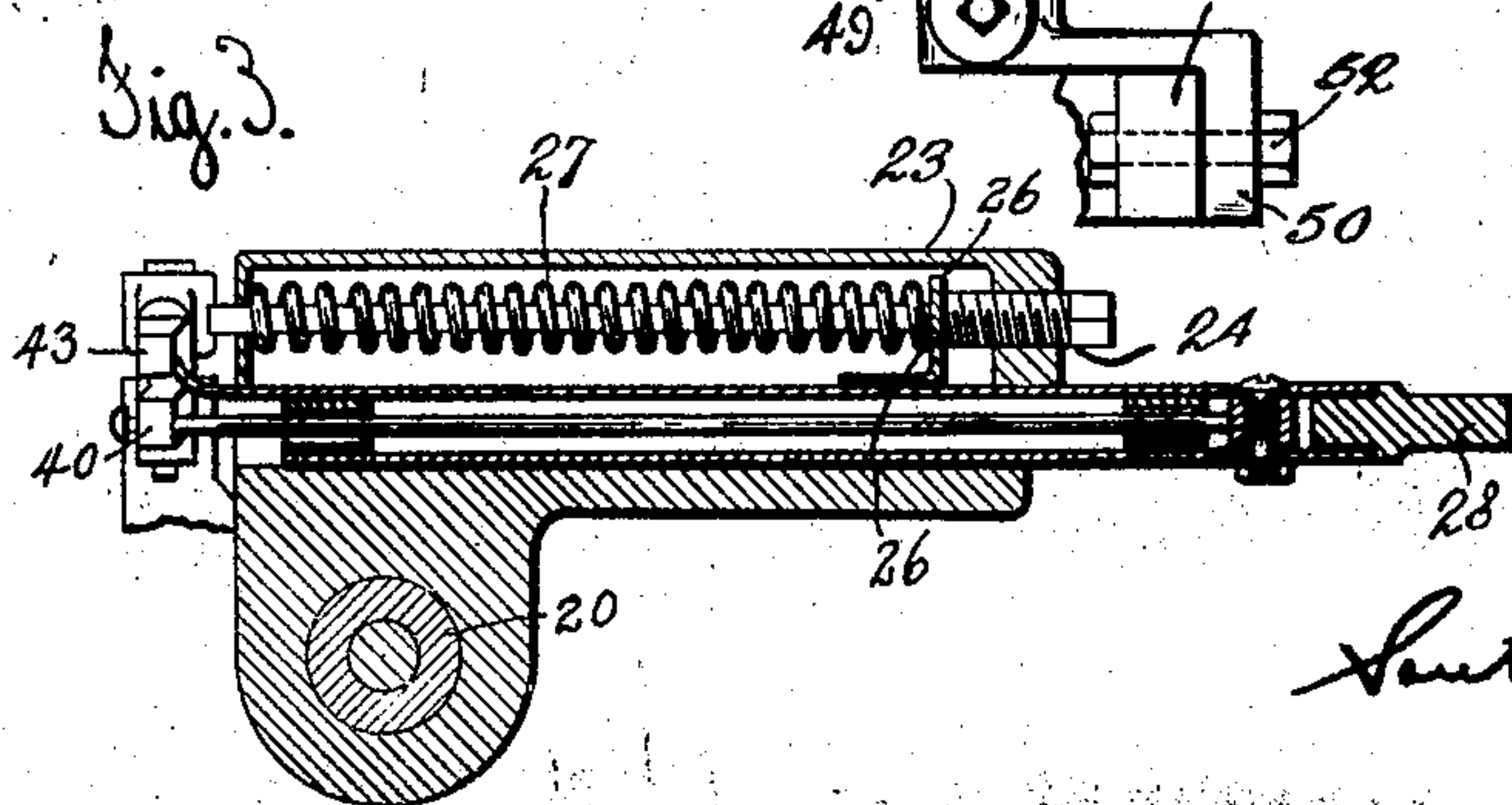
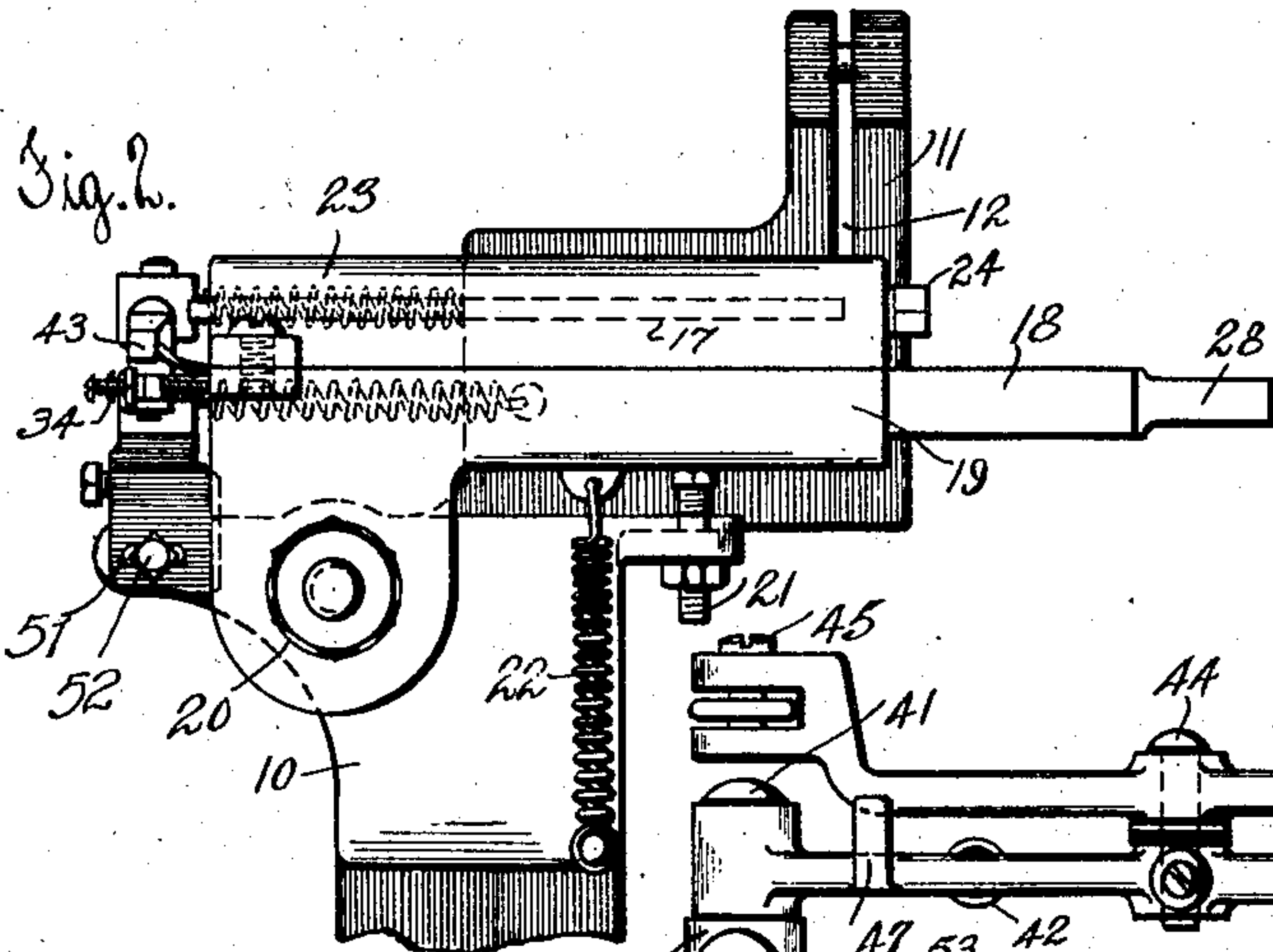
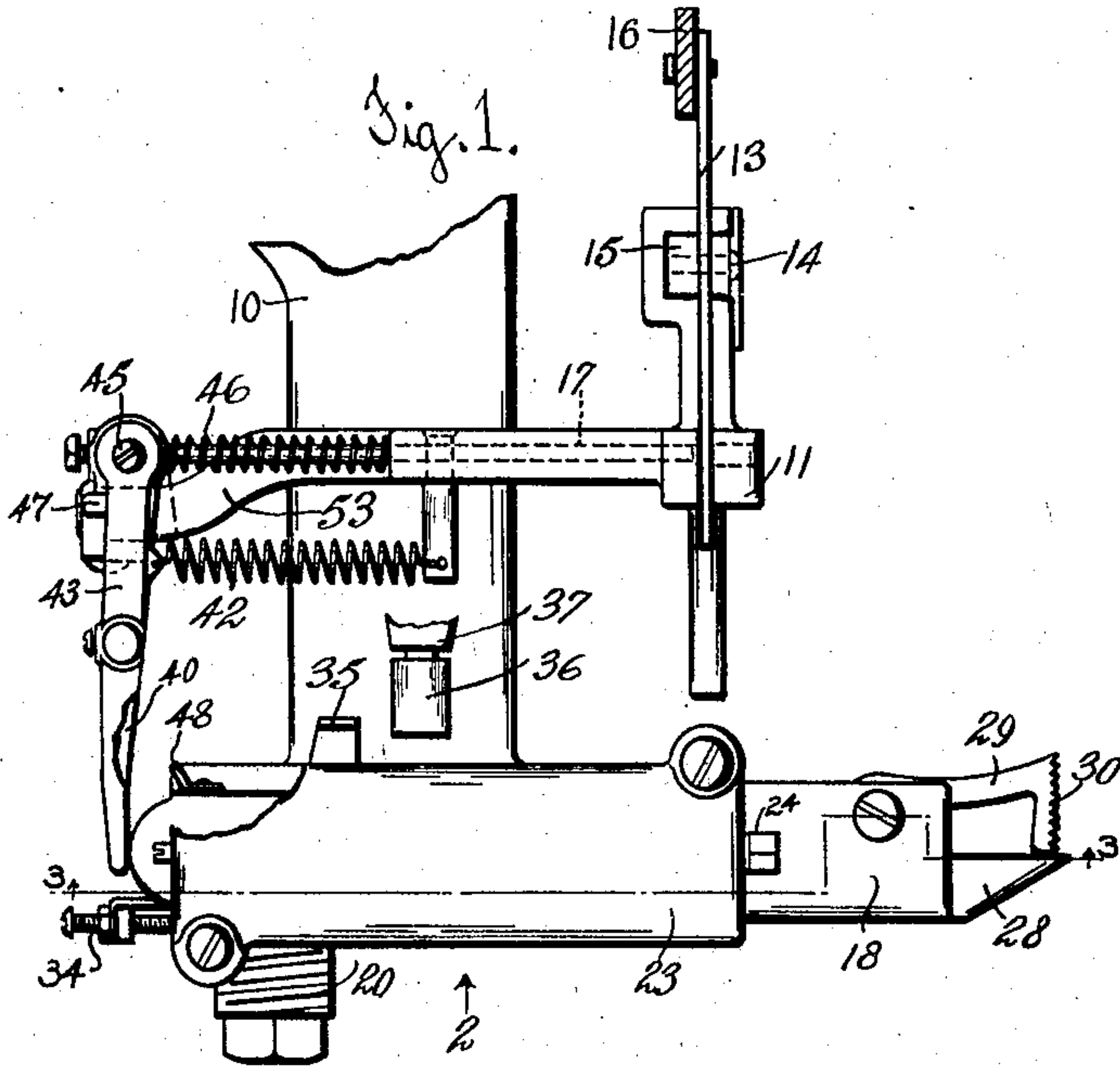


Fig. 7.

Sig. 3.

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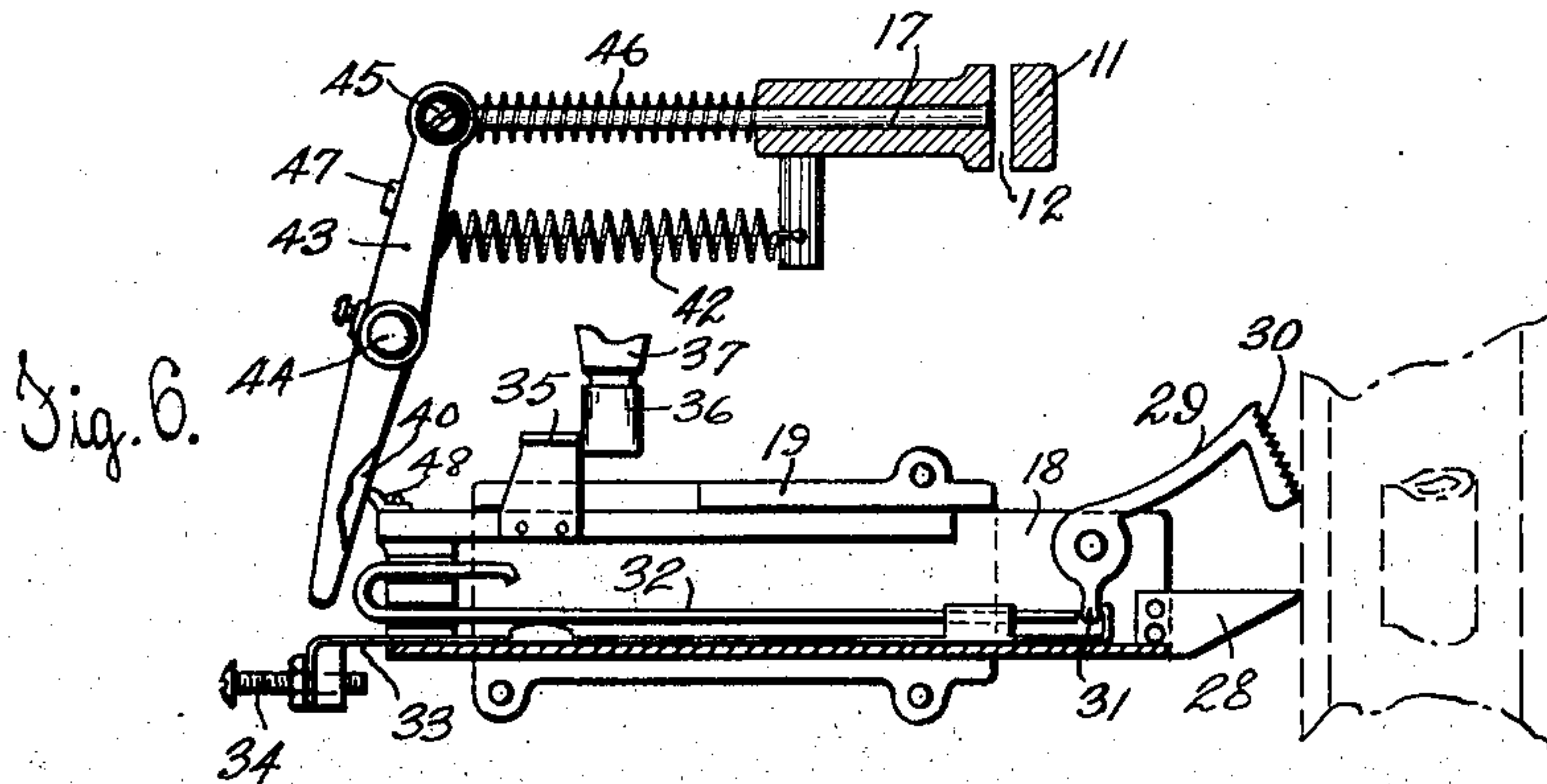
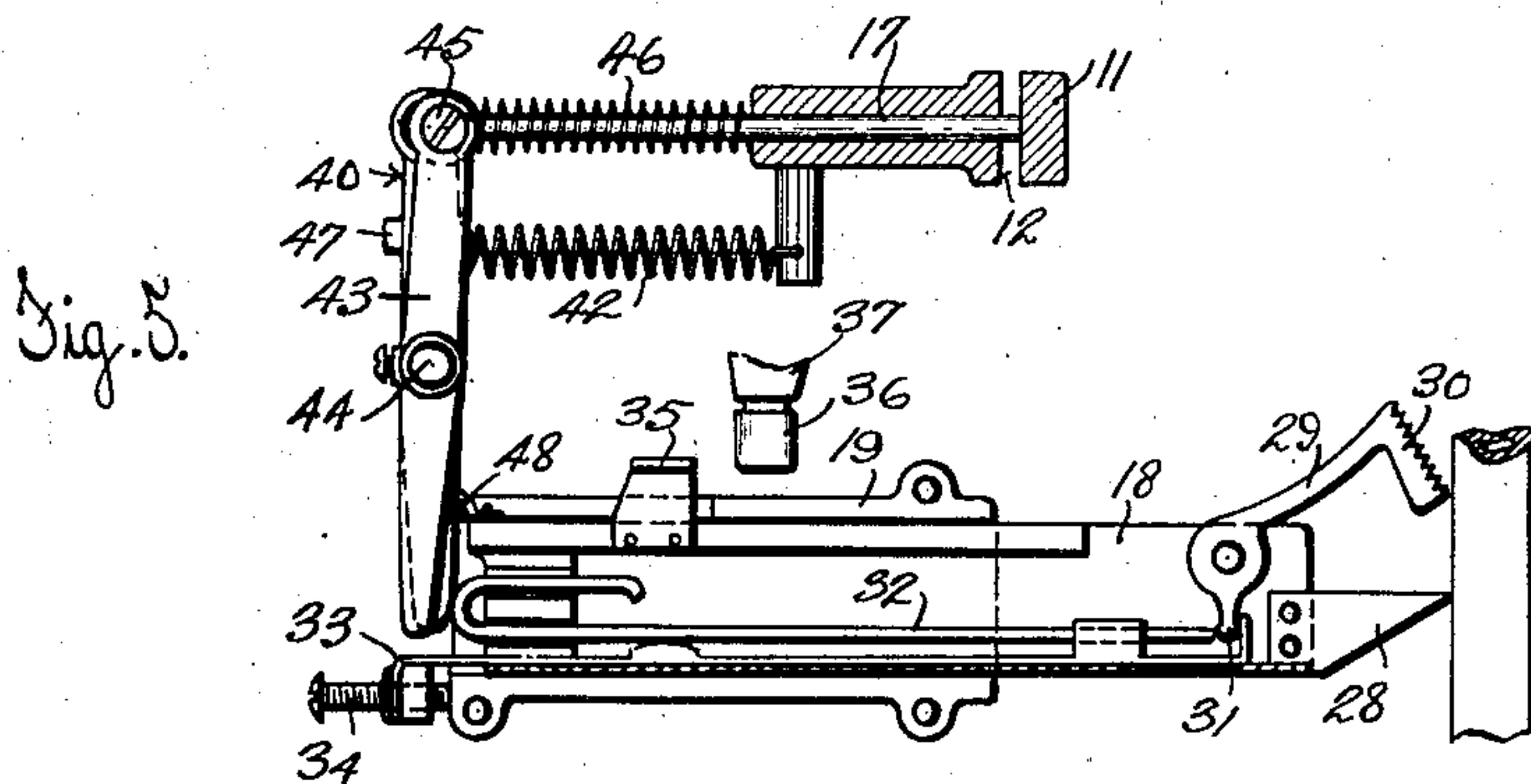
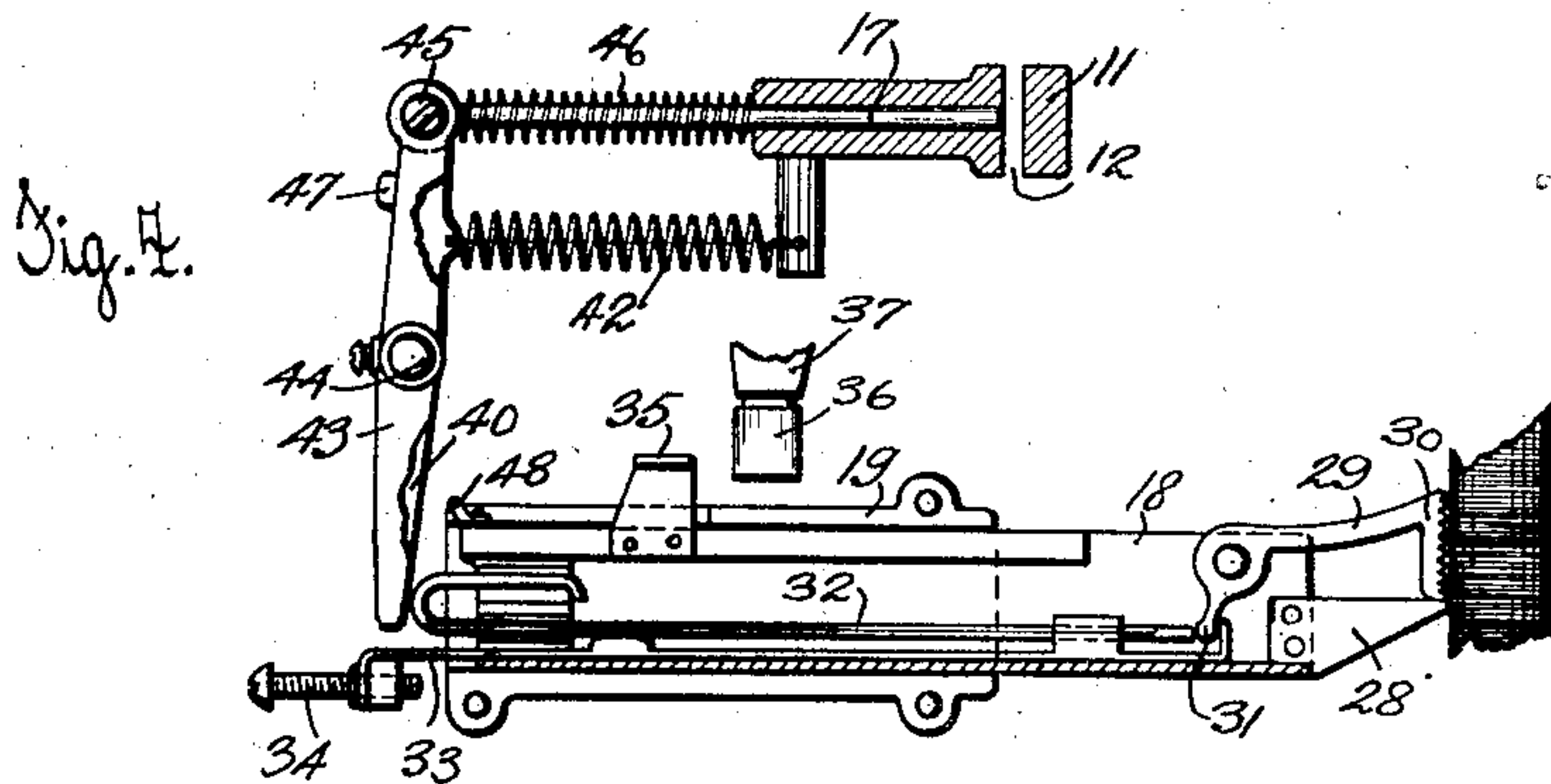
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2 Sheets-Sheet 2



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Patented Nov. 18, 1924.

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UNITED STATES PATENT OFFICE.

RICHARD GREENLEAF TURNER, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO CROMPTON & KNOWLES LOOM WORKS, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

WEFT DETECTOR FOR LOOMS.

Application filed January 5, 1923. Serial No. 610,747.

To all whom it may concern:

Be it known that I, RICHARD GREENLEAF TURNER, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Weft Detector for Looms, of which the following is a specification.

This invention relates to weft detecting mechanism for weft replenishing looms, and more particularly to the type of detectors shown in Patents #972,722 and #1,352,536 granted to Ryon.

In looms of the type referred to in said patents a floating actuator lever moves up and down in a slot and a controller pin normally under and in the path of the actuator is moved out of the slot when sufficient yarn for continued weaving is present in the active shuttle, but when the detector indicates substantial exhaustion of weft the controller pin remains in the slot to operate the actuator lever. In detectors of this type the controller pin is so connected with the detector as to move with every detecting but non-indicating movement of the detector. This motion of the controller is objectionable as it not infrequently cuts a groove in the actuator lever, resulting in uncertain action of the actuator, and also it is found that untimely and incomplete setting of the replenishing mechanism follows. Again, the forward motion of the detector is communicated to the controller by a positive connection, and should the detector be set so as to move all the parts thereof forwardly on the indicating movement, the controller is moved relatively to the actuator as the latter is called upon to do its work. This also results in undesirable wear of the working parts.

An attempt to correct these faults was made in the construction shown in the Compagnon Patent #1,291,415 by having the controller pin normally out of the path of the actuator, but in that instance the controller pin moved with the detector on detecting but non-indicating beats of the lay, and was also arranged with positive connections to the detector and possessed the fault inherent in such a construction.

My improvements have as their principal

object to overcome these defects by keeping the controller pin stationary and out of the path of the actuator on all detecting but non-indicating beats of the lay, irrespective of the varying motions of the detector.

A further object of the invention is to provide connections between the detector and controller pin which will move the latter into operative relation with the actuator and allow it to remain there without being acted upon positively to move from under the actuator by an excessive movement of the detector.

A still further object of the invention is to provide for withdrawing such a detector at transfer without giving a false indication, even though the detector is free to operate in a manner that would ordinarily give such an indication.

My invention further relates to certain arrangements and combinations of parts to be hereinafter described and more particularly pointed out in the claims.

A preferred form of my invention is shown in the accompanying drawings, in which—

Fig. 1 is a top plan view of the detector showing my invention,

Fig. 2 is an end elevation looking in the direction of arrow 2, Fig. 1,

Fig. 3 is a vertical section taken along line 3—3 of Fig. 1,

Fig. 4 is a view similar to Fig. 1 but with certain parts omitted and other parts shown in section,

Figs. 5 and 6 are views similar to Fig. 4 but showing the parts in different positions, and

Fig. 7 is an enlarged front elevation of the compound levers forming an important part of my invention.

Referring to the drawings I have shown a stand 10 secured to the loomside (not shown) and having a horn 11 slotted as at 12 to receive an actuator lever 13 pivoted at 14 to a vertically reciprocating slide 15. A connector 16 pivotally connected to one end of the actuator lever serves to set the weft replenishing mechanism should a controller pin 17 lie under the lever 13 as the slide 15 moves downwardly.

A detector slide 18 is mounted for back

and forth motion in a bed 19 which is mounted on screw 20 supported by stand 10. An adjusting screw 21 also carried by the stand limits downward motion of the bed under action of spring 22. By means of these screws 20 and 21 the detector slide may be adjusted horizontally and vertically with respect to the shuttle.

A cap 23 fastened to the bed is threaded to receive a screw 24 having a shank 25 which extends through arm 26 rigid with slide 18 and guides compression spring 27 by means of which slide 18 is normally pushed rearwardly toward the shuttle.

Reference to Fig. 4 will show that slide 18 carries two detectors, one a wedge-shaped detector 28 fixed thereto and the other a swinging detector 29 pivoted thereto and having a yarn engaging part 30 and an arm 31 which lies between the ends of two rods 32 and 33, respectively. Rod 32 is acted upon by mechanism to be described to open detector 29 while rod 33 serves to close said detector by engagement of screw 34 against bed 19 as the slide moves rearwardly under action of spring 27. A lug 35 carried by the slide 18 is positioned for engagement by a stud 36 which is carried by the transferrer arm indicated at 37 and moved forwardly at the time of weft transfer to move the detector out of the path of the incoming bobbin.

All the mechanism thus far described is old and for a more complete showing of the same reference may be had to Patents #972,722 and #1,352,536 previously referred to. In these patents the controller pin 17 normally lies under the actuator lever 13 and is withdrawn each time a bobbin with sufficient yarn is presented to the detector.

My improvements include a primary lever 40 swinging about fixed pivot 41 and having the free end thereof held in engagement with rod 32 by means of spring 42 hung between the primary lever and the stand 10. A secondary lever 43 is pivoted to and floats on lever 40 as at 44 and has one end thereof in engagement with the detector slide 18. The other end of the secondary lever is pivotally connected to the forward end of the controller pin 17 as indicated at 45 and is normally positioned so that the pivots 41 and 45 are in substantial alignment. To insure this alignment I place a compression spring 46 around the controller pin 17 between the stand 10 and the secondary lever, the effect of which is to hold said lever against a stop 47 formed on the primary lever. The pivots are thus kept in alignment as the levers swing on pivot 41. Spring 46 is weaker than spring 41 and is just strong enough to remove pin 17 from under the actuator lever.

In order that the rear end of pin 17 may be adjusted with respect to the actuator lever 13, I arrange the pivot 41 on a casting 49

having an arm 50 slotted at 51 to receive a bolt 52 threaded into arm 53 projecting forwardly from stand 10. The slot affords longitudinal adjustment of the controller pin.

A finger 48 projecting forwardly from the slide 18 is positioned to engage the primary lever at the time of transfer.

From the foregoing the operation of my improvements will be apparent to those skilled in the art. On normal detecting beats of the lay, when sufficient yarn for continued weaving is presented to the detector, the swinging detector 29 will be restrained from angular motion by the weft and the slide 18 and rod 32 will move forward in unison without altering their relative position, as shown in Fig. 4. This will move the primary and secondary levers about the aligned pivots 41 and 45 and the controller pin will remain at rest in its normal position out of slot 12. However, when the yarn is substantially exhausted detector 29 will swing to the position shown in Fig. 5 by spring 42. This permits rod 32 to remain in its rear position and causes a relative movement of the primary and secondary levers, the pivot 44 not being moved as far forward as in Fig. 4. The result of this action is to move pivot 45 rearwardly and place the controller pin under the actuator lever 13 to effect weft replenishment. Should the slide 18 be set to continue moving forward after the controller pin is under the actuator lever, the primary and secondary levers will move forwardly in the same relative position shown in Fig. 5 and the tendency of spring 46 to remove the controller pin will not be increased and said pin will remain under the actuator irrespective of excess motion of slide 18.

At the time of transfer it is desirable to withdraw the detector from the path of the incoming bobbin and also to prevent a second or false indication of weft exhaustion as the depleted shuttle arrives under the replenishing mechanism. The yarn engaging detector 30 will move angularly to cause a relative motion of the levers 40 and 43 whenever the slide 18 is moved forwardly and said detector 30 is unresisted. When the transferrer arm descends stud 36 will move forwardly and engage lug 35 to draw slide 18 away from the shuttle and the detector 30, not being in contact with the yarn, will swing angularly under the action of rod 32. The result of this is to move rod 17 under actuator 13 but as this would result in a false indication it is necessary to provide means to withdraw said rod 17. Accordingly, I secure finger 48 on slide 18 and as the latter continues to move forwardly under the action of stud 36, said finger will engage lever 40 and move the same to the position shown in Fig. 6. The pivot of lever 43 is there-

fore moved far enough to carry the free end thereof away from the forward upturned end of the slide 18 and spring 46 acts to withdraw rod 17. This latter action takes place before the actuator 13 starts to move down.

It will be noticed that since springs 42 and 46 are in tension and compression, respectively, an adjustment of the casting 49 forwardly will increase the pressure of spring 42 and lessen that of spring 46, and that the relation of the springs may be readily varied by a simple adjustment.

It will be apparent that I have provided a simple weft detecting mechanism wherein the controller pin is normally at rest on all non-indicating detecting beats of the lay irrespective of the motion of the detector; that the controller pin, after moving under the actuator, is not acted upon by additional force to move with respect to the actuator should the detector motion be excessive; that at transfer the control of the primary lever which determines the position of the controller pin shifts from the detector to the detector slide to keep the controller pin at rest; and that the springs acting to place the controller pin are so related that by a single adjustment the pressure of one may be strengthened as the pressure of the other is weakened.

Having thus described my invention, it will be evident that changes and modifications can be made therein by those skilled in the art without departing from the spirit and scope of my invention as set forth in the claims, and I do not wish to be otherwise limited to the details herein disclosed, but what I claim is—

1. In a weft detector for weft replenishing looms, an actuator for the replenishing mechanism, a controller for said actuator, a detector subject to varying movements under influence of the shuttle, and connections extending between the detector and controller, said connections including a pair of levers pivoted together one of which levers moves about a fixed pivot and the other of said levers being connected to said controller, the levers being movable by said detector.

2. In a weft detector for weft replenishing mechanism, an actuator for the replenishing mechanism, a controller for said actuator, a detector comprising two relatively movable parts, a pair of levers pivoted together, one to be engaged by each of said parts of the detector, a fixed pivot for one of said levers, and connections between said controller and the other of said levers.

3. In a weft detector for weft replenishing mechanism, an actuator for said mechanism, a controller for said actuator, a detector having two relatively movable parts, a primary lever having a fixed pivot and engaging one of said detector parts, a sec-

ondary lever pivoted to the primary lever and engaging the other part of said detector, and connections between the controller and said secondary lever.

4. In a weft detector for weft replenishing mechanism, an actuator for said mechanism, a controller for said actuator, a detector having two relatively movable parts, a primary lever having a fixed pivot and engaging one of said detector parts, a secondary lever pivoted to the primary lever and engaging the other part of said detector, and connections between the controller and said secondary lever, the connection between the controller and secondary lever being normally in alignment with said fixed pivot for the primary lever.

5. In a weft detector for weft replenishing mechanism, an actuator for the mechanism, a controller for said actuator, a detector having two relatively movable parts, a primary lever movable about a fixed pivot and engaging one of said detector parts, a secondary lever pivoted to the primary lever and engaging the other of said detector parts, means to cause relative movement of the detector parts at substantial weft exhaustion to move said controller into operative relation with respect to the actuator, said means permitting continued motion of the primary lever without moving the controller.

6. In a weft detector for weft replenishing mechanism, an actuator for said mechanism, a controller for said actuator, a detector comprising two relatively movable parts, a lever movable about a fixed pivot and engaging one of the detector parts, means carried by the lever to engage the other detector part and move said controller into operative relation with the actuator when the detector parts move otherwise than in unison, and means acting at transfer of weft to give said detector an excessive forward movement, said means establishing engagement between the lever and that part of the detector with which it is normally out of contact.

7. In a weft detector for weft replenishing mechanism comprising a stand, an actuator for said mechanism, a controller for the actuator, a detector having two relatively movable parts, a pair of levers pivoted together, one engaging each part of the detector, an adjustable pivot for one of said levers, a connection between the other lever and the controller, resilient tension means between one of said levers and the stand, and resilient compression means weaker than said tension means between the other of said levers and said stand.

8. In a weft detector for looms, an actuator to effect a change in the operation of the loom, a weft detector, means to adjust the position of the weft detector toward and



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from the surface to be detected, a controller for the actuator normally inoperative with respect to the actuator and movable in a direction substantially parallel to the
5 direction the detector moves when adjusted, and means interposed between the detector and the controller effective to move said con-

troller into operative position with respect to the actuator at the beginning of an indicating movement of the detector in whatever
adjusted position the detector may occupy. 10

In testimony whereof I have hereunto affixed my signature.

RICHARD GREENLEAF TURNER.