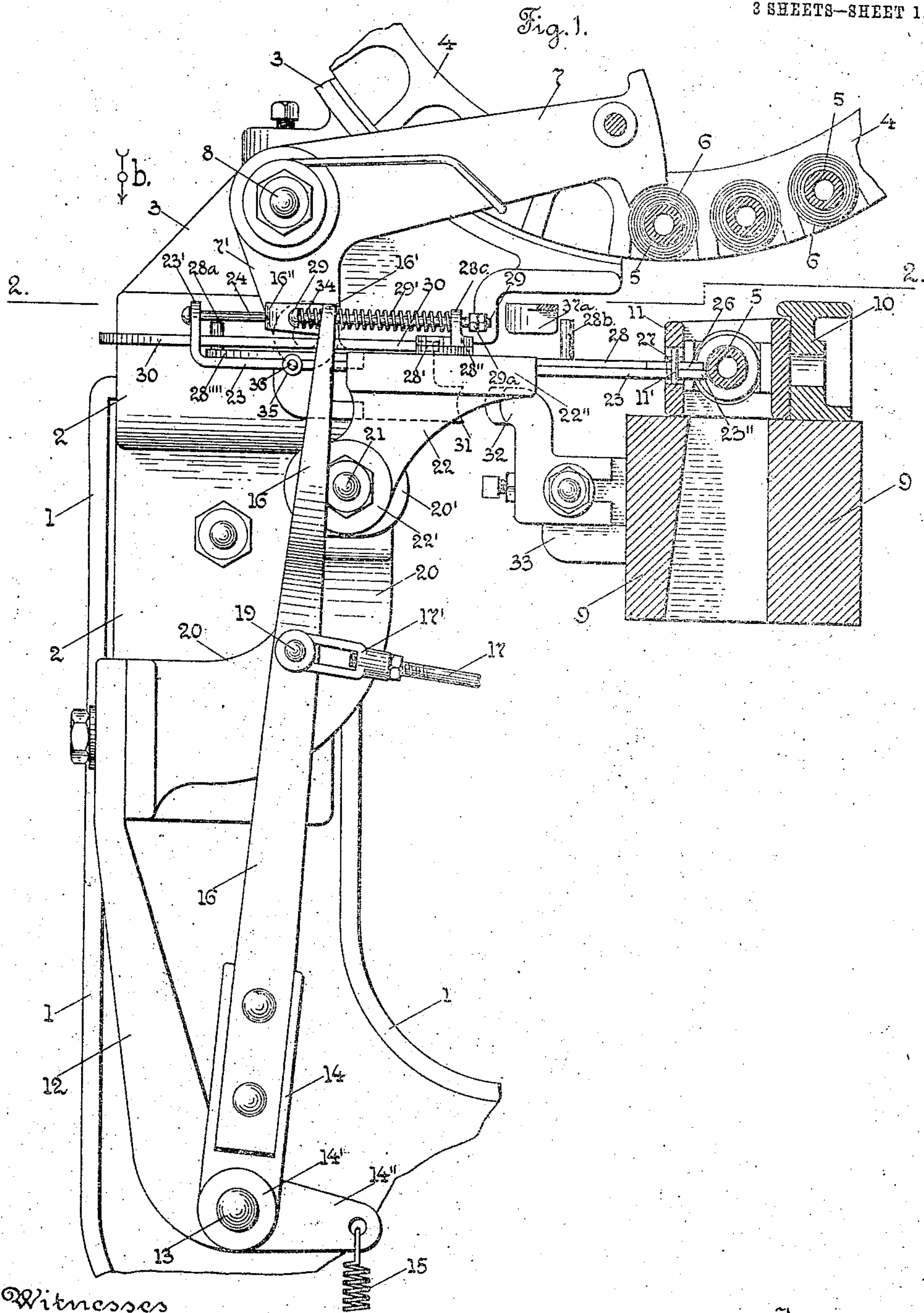


B. F. McGUINNESS.  
WEFT REPLENISHING LOOM.  
APPLICATION FILED MAR. 3, 1909.

943,756.

Patented Dec. 21, 1909.

3 SHEETS—SHEET 1.



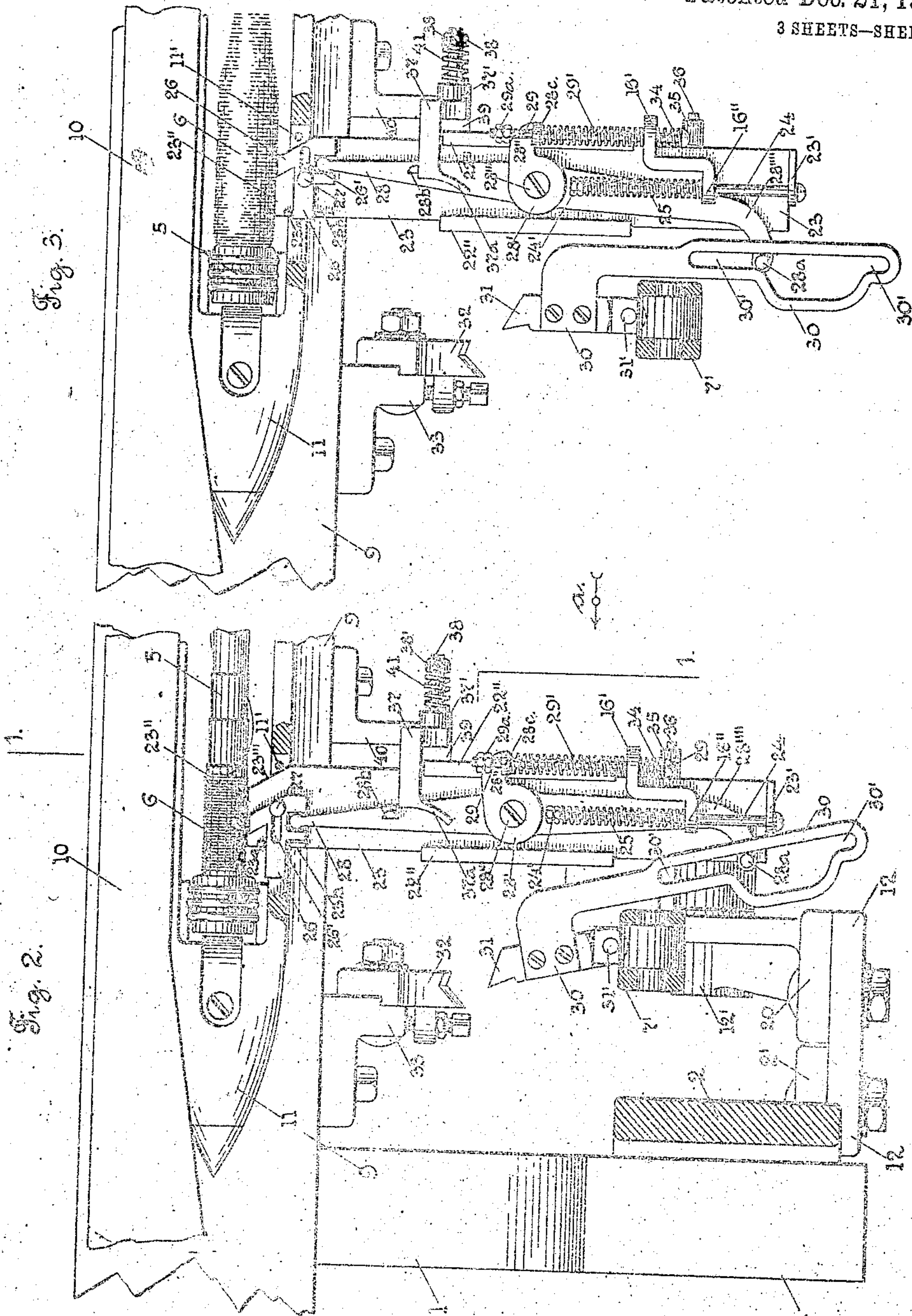
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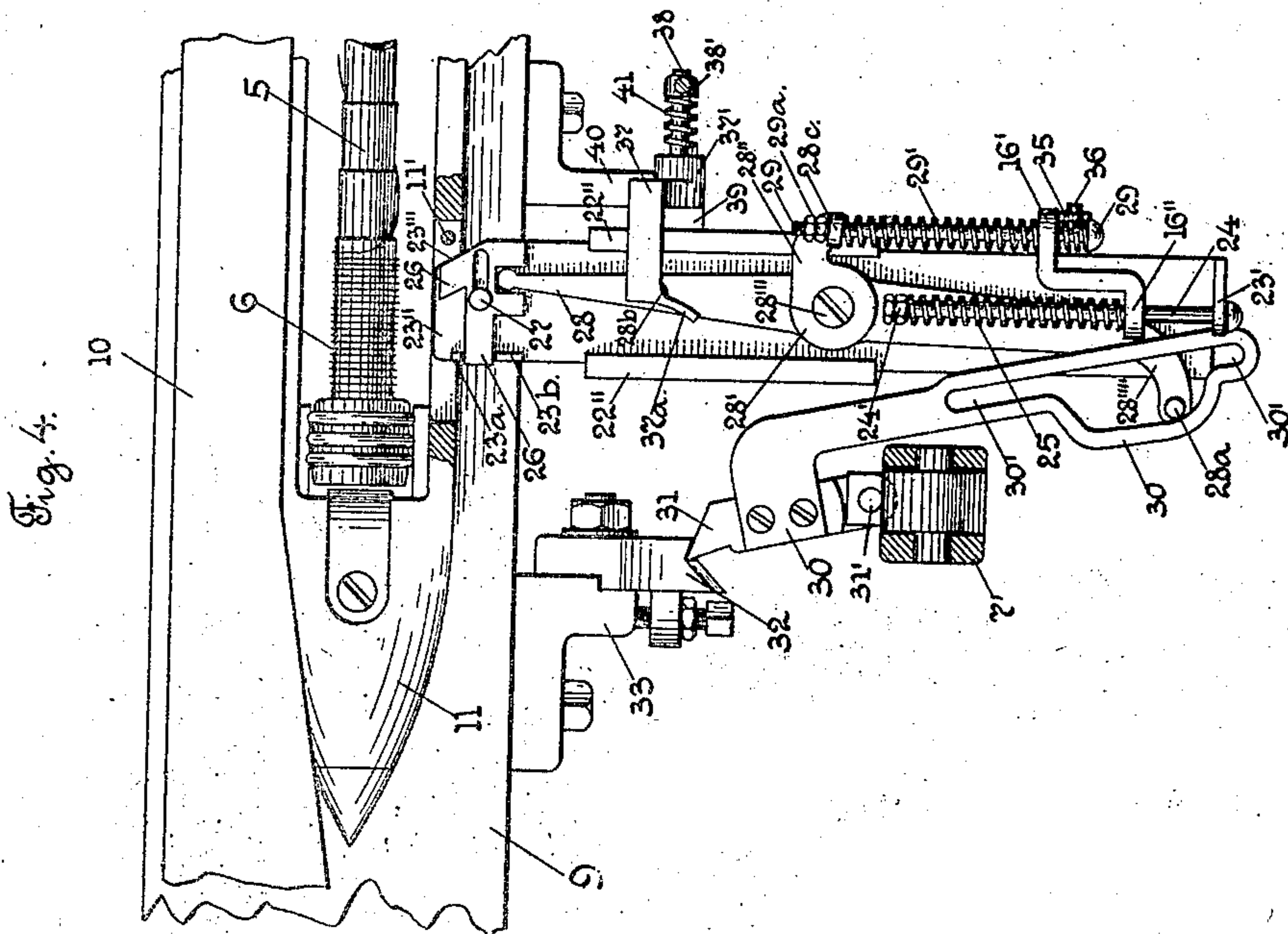
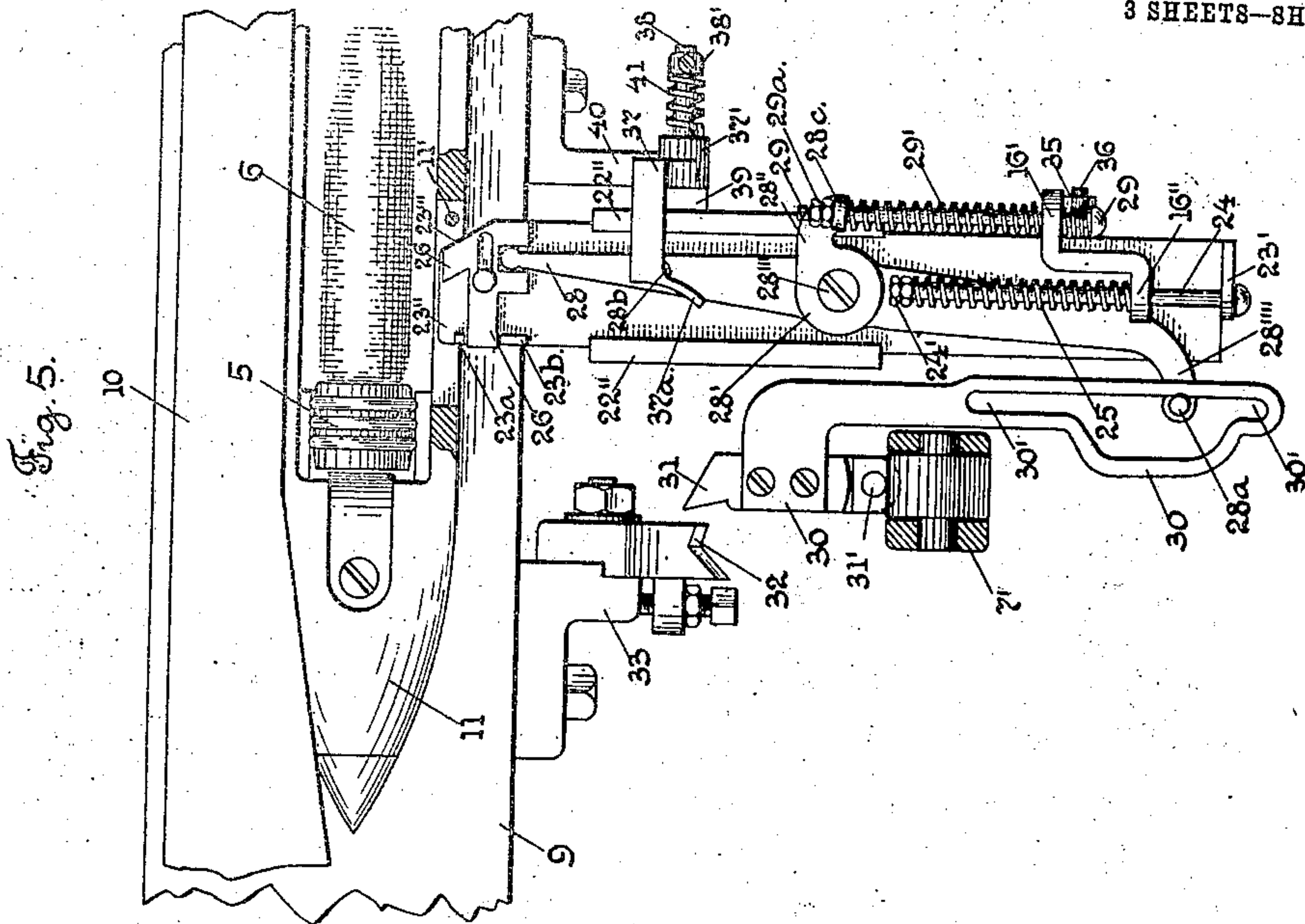
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# UNITED STATES PATENT OFFICE.

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## WEFT-REPLENISHING LOOM.

943,756.

Specification of Letters Patent.

Patented Dec. 21, 1909.

Application filed March 3, 1909. Serial No. 481,030.

*To all whom it may concern:*

Be it known that I, BENJAMIN F. McGUINNESS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Weft-Replenishing Looms, of which the following is a specification.

My invention relates to a weft replenishing loom, and particularly to a mechanical filling detector mechanism for weft replenishing looms, of the class which is located at the magazine end of the loom, and on the loom side or end, and is provided with a feeler to feel through an opening in the binder and in the front wall of the shuttle box, and through an opening in the shuttle, and engage with the filling on the bobbin, or filling carrier in the shuttle, on every other forward movement of the lay.

The object of my invention is to improve upon the construction of the filling detector mechanism of the class referred to, and more particularly to provide a more sensitive and delicate filling detector mechanism, having a feeler to feel for and detect the practical or substantial exhaustion of filling on the bobbin in the running shuttle, without regard to the size of the bobbin on which the filling is wound, or the position of the bobbin in the shuttle.

In my improved filling detector mechanism, which is preferably located on the frame or stationary part of the loom, I provide a slide having a reciprocating movement, and which is moved into the shuttle to engage the filling on the bobbin, through an opening in the binder and in the shuttle box and in the side of the shuttle. A second slide is attached to the first mentioned slide, and is loosely held thereon, and is adapted to move in a direction lengthwise of the bobbin, and at right angles to the direction of movement of the first-mentioned slide. When the first-mentioned slide engages the filling on the bobbin in the shuttle, it depresses the filling and causes the second-mentioned slide, by its engagement with the filling, to be held in its inoperative position. When the filling on the bobbin is practically or substantially exhausted, the few layers of filling on the bobbin will not be depressed sufficiently to prevent the transversely moving slide from operating, and a lever, which yieldingty operates said slide, will move it

along the filling on the bobbin, and cause a bunter on the transferrer arm, which is connected with and operated by said lever, to be moved into the path of a dagger on the lay, to be engaged by said dagger, to operate the transferrer arm and cause a fresh filling to be inserted into the running shuttle on the same pick, all as will be hereinafter fully described.

My invention consists in certain novel features of construction of my improvements as will be hereinafter fully described.

I have only shown in the drawings a detached portion of a weft replenishing loom with my improvements applied thereto, sufficient to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings:—Figure 1 is an end view of a detached portion of a weft replenishing loom with my improvements combined therewith; also a section, on line 1, 1, Fig. 2, looking in the direction of arrow *a*, same figure. Fig. 2 is a section, on line 2, 2, Fig. 1, looking in the direction of arrow *b*, same figure. Fig. 3 corresponds to Fig. 2, but shows some of the parts in a different position: some of the parts shown in Fig. 2 are not shown in this figure. Fig. 4 corresponds to Fig. 2, but shows some of the parts in a different position, and, Fig. 5 corresponds to Fig. 3, but shows some of the parts in a different position.

In the accompanying drawings, 1 is a portion of the loom side or end frame, having a stand 2 secured thereon, on which is mounted the lower portion of the stand 3 of the rotary magazine 4, which carries the bobbins or filling carriers 5, having filling 6 thereon.

7 is a transferrer arm, which is pivotally mounted on a stud 8, and has a downwardly extending arm 7', 9 is a portion of the lay beam and 10 is a stationary shuttle box with the shuttle 11 therein.

The shuttle binder, not shown, has an opening therethrough for the passage of the filling detector.

All of the above mentioned parts may be of the usual and well known construction.

The stand 2 has an extension 2', see Fig. 2, on which is secured a downwardly extending bracket 12, see Fig. 1, having a boss 12', see Fig. 2, carrying a stud 13, on which is pivotally mounted the hub 14' of a shoe



14. An arm 14'' extends out from the hub 14', and has connected thereto one end of a helically coiled contraction spring 15; the other end of said spring is connected to some stationary part of the loom, not shown. The spring 15 is adapted to yieldingly move the shoe 14 in one direction. Secured on said shoe 14 is an upwardly extending arm 16, which is operated every other pick from some moving part of the loom, not shown, through a connector 17, which has a rod-head 17' pivotally mounted on a stud 19 on the arm 16. The upper end of the arm 16 is adapted to move the feeler slide every other pick, in the manner to be hereinafter described.

Secured on the bracket 12 and extending upwardly therefrom is a bracket or stand 20, see Fig. 1, the upper end of which has a boss 20', on which is adjustably secured by a bolt 21, the boss 22' of a stand 22, see Fig. 1. The upper enlarged portion 22'' of the stand 22 is adapted to hold and guide the slide plate 23 of the filling feeler mechanism. The outer end of the slide plate 23 is bent upwardly at 23', see Fig. 1, to receive and hold the rod 24, which extends through the upper bent offset end 16'' on the lever 16. The inner end of the slide plate 23, enters through an opening in the front wall of the stationary shuttle box, and through an opening in the shuttle, to engage the filling. Its engaging end may have teeth thereon, if preferred. A helically coiled expansion spring 25 encircles the rod 24, and bears at one end against the offset end 16'' on the lever 16, and at its other end against the nuts 24' on the rod 24, see Fig. 2. The inward movement of the arm 16, through the spring 25, acts to yieldingly move inwardly the slide plate 23, and cause its inner end 23'' to engage the bobbin in the shuttle when the lay is on its forward movement, see Fig. 3. If the slide plate 23 enters far enough into the shuttle 11, see Fig. 2, the inclined edge 23''' on said plate 23 will engage a pin 11', which in this instance is secured in the shuttle at the inner end of the opening 11'' in the shuttle, to position the shuttle, preparatory to the feeler 23 engaging the filling on the practically or substantially exhausted bobbin, see Fig. 2. A second slide 26 is mounted on the inner end of the slide 23, and is held thereon by a headed pin or stud 27, which extends through an elongated slot 26' in the slide 26. Said slide 26 has a movement with the slide 23, and also a movement in a direction at right angles to the movement of the slide 23. The projections 23<sup>a</sup> and 23<sup>b</sup> on the slide 23, see Figs. 1, and 2, act to guide the slide 26. The inner end of the slide 26 is adapted to engage with the filling on the bobbin. Said end may be provided with teeth if desired.

A transverse movement is communicated

to the slide 26 by a lever 28, which has its hub 28' pivotally mounted on a stud 28''' secured on the plate 23. Extending out from one side of the hub 28' is an arm 28'' having an ear or lug 28<sup>c</sup> thereon, which is adapted to loosely receive a rod 29, which extends through the upper end 16' of the lever 16. The rod 29 has two nuts 29<sup>a</sup> on its inner end, which engage the lug 28<sup>c</sup> to rock the lever 28. A helically coiled expansion spring 29' encircles the rod 29, and bears at one end against the lug or projection 28<sup>c</sup>, and at its other end against the upper end of the arm or lever 16, and acts to yieldingly move the arm 28'' to the left, see Fig. 2, and also the lever 28 on its pivotal stud 28''', to move the slide 26 lengthwise of the bobbin, when said lever 28 is unlocked from the slide 23, and the filling is practically or substantially exhausted, as shown in Fig. 2.

On the outer end 28'''' of the pivotally mounted lever 28 is a stud or pin 28<sup>a</sup>, which extends upwardly into an elongated slot or opening 30' in the outer end of an arm 30, which slot has an offset on one side. The inner end of the arm 30 is secured upon the bunter 31, which is pivotally mounted at 31' on the downwardly extending arm 7' on the transfer arm 7, see Fig. 1.

On the front of the lay beam 9 is secured a stand 33, and a dagger 32 is adjustably mounted on said stand, and is adapted to engage the bunter 31, as the lay beats up, when said bunter is moved into the path of said dagger, as shown in Figs. 2 and 4.

Near the inner end of the lever 28 is in this instance a stud or pin 28<sup>b</sup> extending up from said lever, and preferably of curved or cam-shape on one side, and flat on the other, see Fig. 2. The stud or pin 28<sup>b</sup> on the lever 28 coöperates with a lever 37, having the curved or cam-shaped engaging end 37<sup>a</sup>, back of which the pin 28<sup>b</sup> is adapted to pass, to hold the lever 28 and the slide 26 thereon in their normal inoperative position, as shown in Figs. 3, 4, and 5. The lever 37 has its hub 37' in this instance pivotally mounted on a stud or pin 38, secured on the lower end of a stand 40 secured to the lay beam, and a spiral spring 41, attached at one end to a collar 42 fast on said stud 38, and at its other end to the hub 37' on the arm 37, acts to yieldingly hold the arm 37 in its normal raised position, and against a stop, not shown.

By means of the helically coiled torsion spring 41, the arm 37 is yieldingly held in its raised position, and may be moved backward, to allow the pin 28<sup>b</sup> to pass by it, in case said pin is not properly positioned to pass back of the curved arm 37<sup>a</sup> on said arm 37.

From the above description in connection with the drawings the operation of my im-



improvements will be readily understood by those skilled in the art, and briefly is as follows:—

When the loom is operating normally and there is a sufficient amount of filling on the bobbin, as the lay moves forward, the slide 23, carrying the lever 28, and the second slide 26, will be moved forward to enter the opening at the front of the shuttle box and the opening in the shuttle, as shown in Fig. 3, by the inward movement of the upwardly extending arm 16, through the spring 25 on the rod 24. The arm 37 carrying the engaging end 37<sup>a</sup>, will remain in its normal position, and the pin 28<sup>b</sup> extending back of the extension 37<sup>a</sup>, will hold the lever 28 in its normal position, against the action of the expansion spring 29' on the rod 29, and the arm 30 will remain in its normal position, with the bunter 31 out of the path of the dagger 32, see Fig. 3. After the engaging ends of the slides 23 and 26 have engaged the filling on the bobbin, as shown in Fig. 3, the slide 23 and the lever 28 thereon, and the slide 26, are moved outwardly by the outward movement of the arm 16, through the engagement of the upper end of said arm with the spring 34 on the pin 29, and also its engagement with the roll 35, as shown in Fig. 5; the several parts are held in their same relative positions, and this operation is repeated every other forward movement of the lay, as long as there is a sufficient amount of filling on the bobbin.

When the filling on the bobbin is practically or substantially exhausted, as shown in Fig. 2, the slide 23 is moved forward sufficiently to allow the pin 28<sup>b</sup> to pass by the engaging projection 37<sup>a</sup> on the arm 37, and allow the expansion spring 29' to act, to move the lever 28 on its pivotal pin 28<sup>b</sup>, and cause the slide 26 to be moved to the left, by the engagement of the inner end of said lever 28 with said slide, and the arm 30, connected with the bunter 31, will be moved to the right, to bring the bunter 31 in the path of the dagger 32, as shown in Fig. 2.

In the continued operation of the loom, the outward movement of the arm 16 will move the slide 23 outwardly and away from the shuttle, as shown in Fig. 4, and the engagement of the inner nut 29<sup>a</sup> on the rod 29, with the extension 28'' on the hub 28', will move the lever 28 on its pivotal support, and also move the slide 26 back to its normal position at the right, and also bring the pin 28<sup>b</sup> back of the extension 37<sup>a</sup> on the arm 37, so that in the continued backward movement of the slide 23, the pin 28<sup>b</sup> will be moved back of the extension 37<sup>a</sup>, to lock the lever 28 and the slide 26 in their inoperative position. The next forward movement of the slide 23 will move the pin 28<sup>a</sup> on the lever 28, in the slot 30' in the lever 30, to the front narrow part of said slot, to move said lever 30 into

its normal inoperative position, as shown in Fig. 3.

When the filling on the bobbin is substantially exhausted, as shown in Fig. 2, in case the shuttle is not in proper position in the shuttle box, the inclined edge on the slide 23 will engage the pin 11' in the shuttle, and act to move outwardly, or position the shuttle, preparatory to the removal of the bobbin from the shuttle, and the transfer of a new bobbin.

The advantages of my improvements will be readily appreciated by those skilled in the art. The transversely movable slide 26, which, when the filling is practically or substantially exhausted acts to put into operation the filling transferring mechanism, is, through lever 28 and the arm 30, connected with the bunter 31 pivotally mounted on the downwardly extending arm 7' on the transfer arm 7, so that the movement of the slide 26 on detecting the practical or substantial exhaustion of filling in the active shuttle, is communicated, through intermediate connections, directly to a part of the transferring mechanism, to cause the immediate operation of the transfer arm, as the lay advances on its forward movement and the dagger 32 engages the bunter 31.

It will be understood that the details of construction of my improvements may be varied if desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a filling detector mechanism for weft replenishing looms, a feeler slide located on the stationary part of the loom, and having a movement in a direction at right angles to the axis of the bobbin in the shuttle, and adapted to enter an opening through the shuttle and to engage the filling on the bobbin, and also to engage a stud or pin on the shuttle to position the shuttle, and means for causing said movement.

2. In a filling detector mechanism for weft replenishing looms, a slide located on the stationary part of the loom, and having a movement in a direction at right angles to the axis of the bobbin in the shuttle, and adapted to enter an opening through the shuttle and to engage the filling on the bobbin, and also to engage a stud or pin on the shuttle to position the shuttle, and a second slide mounted on and moving with said first-mentioned slide, and adapted to enter an opening through the shuttle and to engage the filling on the bobbin, and also having a movement in a direction at right angles to the direction of movement of the first-mentioned slide and separate means for causing the movement of each of said slides.

3. In a filling detector mechanism for weft replenishing looms, a slide mounted on a stationary part of the loom, and moving



in a direction at right angles to the axis of the bobbin in the shuttle, and adapted to enter an opening through the shuttle and to engage the filling on the bobbin, and means for yieldingly moving said slide to engage the bobbin, and means to positively move said slide to disengage it from the filling; and a second slide mounted on and movable with the first-mentioned slide, and adapted to enter an opening through the shuttle and to engage the filling on the bobbin, and also having a movement in a direction at right angles to the direction of movement of the first-mentioned slide, and a lever for moving said slide, and also for moving a connection to a bunter connected with the transferring mechanism, and said bunter, adapted to be moved into, and out of the path of a dagger on the lay, and said dagger.

4. In a filling detector mechanism for weft replenishing looms, located on the stationary part of the loom frame, a slide having a reciprocating movement toward and away from a bobbin in the active shuttle, and adapted to enter through an opening in the shuttle and to engage the filling, and means for moving said slide, and a second slide mounted on and moving with the first-mentioned slide, and adapted to enter an opening in the shuttle and to engage the filling on the bobbin, and also having a movement on the first-mentioned slide in the direction of the length of the shuttle, and means for moving said second-mentioned slide, and a bunter connected with the transfer mechanism, and connections to said bunter, to move it into the path of a dagger on the lay, to cause the operation of the transfer mechanism.

5. In a filling detector mechanism for weft replenishing looms, a slide located on the stationary part of the loom, and having a movement in a direction at right angles to the axis of the bobbin in the shuttle, and adapted to enter an opening through the shuttle and to engage the filling on the bobbin, and means to move said slide, and a second slide mounted on and moving with the first-mentioned slide, and adapted to enter an opening through the shuttle, and to

engage the filling on the bobbin, and also having a movement in a direction at right angles to the direction of movement of the first-mentioned slide, and means for moving said second-mentioned slide.

6. In a filling detector mechanism for weft replenishing looms, a slide located on the stationary part of the loom, and having a movement in a direction at right angles to the axis of the bobbin in the shuttle, and adapted to enter an opening through the shuttle and to engage the filling on the bobbin and means for moving said slide, and a second slide mounted on and moving with the first-mentioned slide, and adapted to enter an opening through the shuttle, and to engage the filling on the bobbin, and also having a movement in a direction at right angles to the direction of movement of the first-mentioned slide, and means for moving said second-mentioned slide and connection intermediate said second-mentioned slide and the transfer mechanism.

7. In a filling detector mechanism for weft replenishing looms, a slide located on the stationary part of the loom, and having a movement in a direction at right angles to the axis of the bobbin in the shuttle, and adapted to enter an opening through the shuttle and to engage the filling on the bobbin, and means for moving said slide and a second slide mounted on and moving with the first-mentioned slide, and adapted to enter an opening through the shuttle and to engage the filling on the bobbin, and also having a movement in a direction at right angles to the direction of movement of the first-mentioned slide, and means for moving said second-mentioned slide, and connections intermediate said second-mentioned slide and the transfer arm of the transfer mechanism, said connections comprising a pivotally mounted lever; an arm operated by said lever, a bunter connected with said arm and pivotally mounted on an arm on the transfer arm.

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Witnesses:

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