

No. 860,566.

PATENTED JULY 16, 1907.

C. F. PERHAM.
WEFT REPLENISHING MECHANISM FOR LOOMS.

APPLICATION FILED OCT. 21, 1899.

5 SHEETS—SHEET 1.

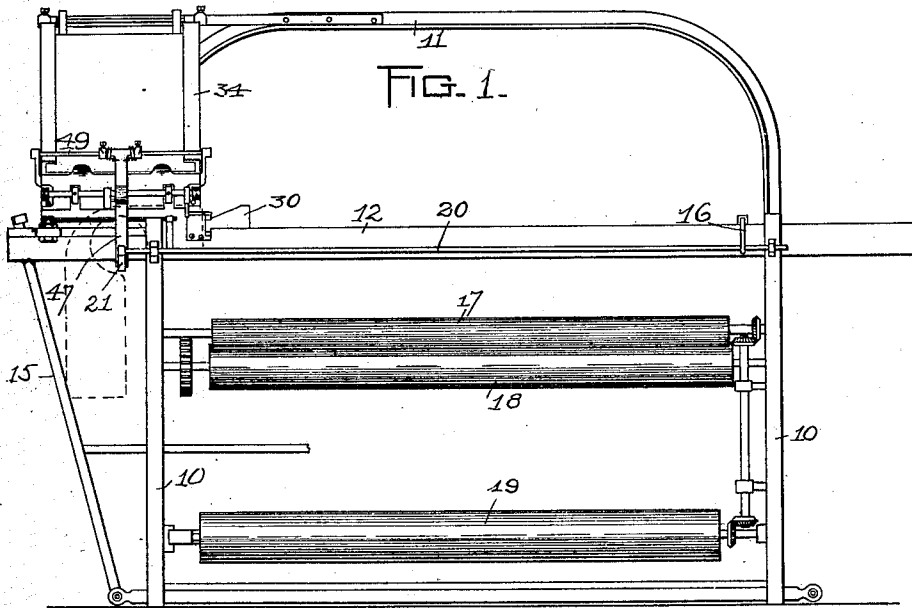
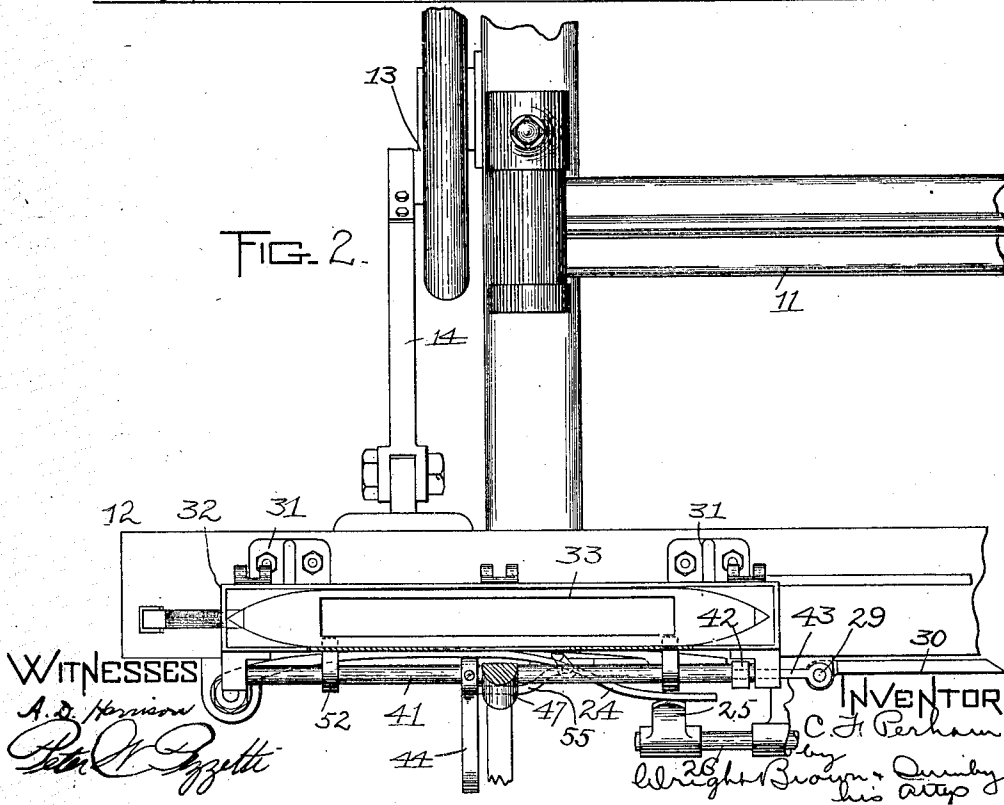


FIG. 2.



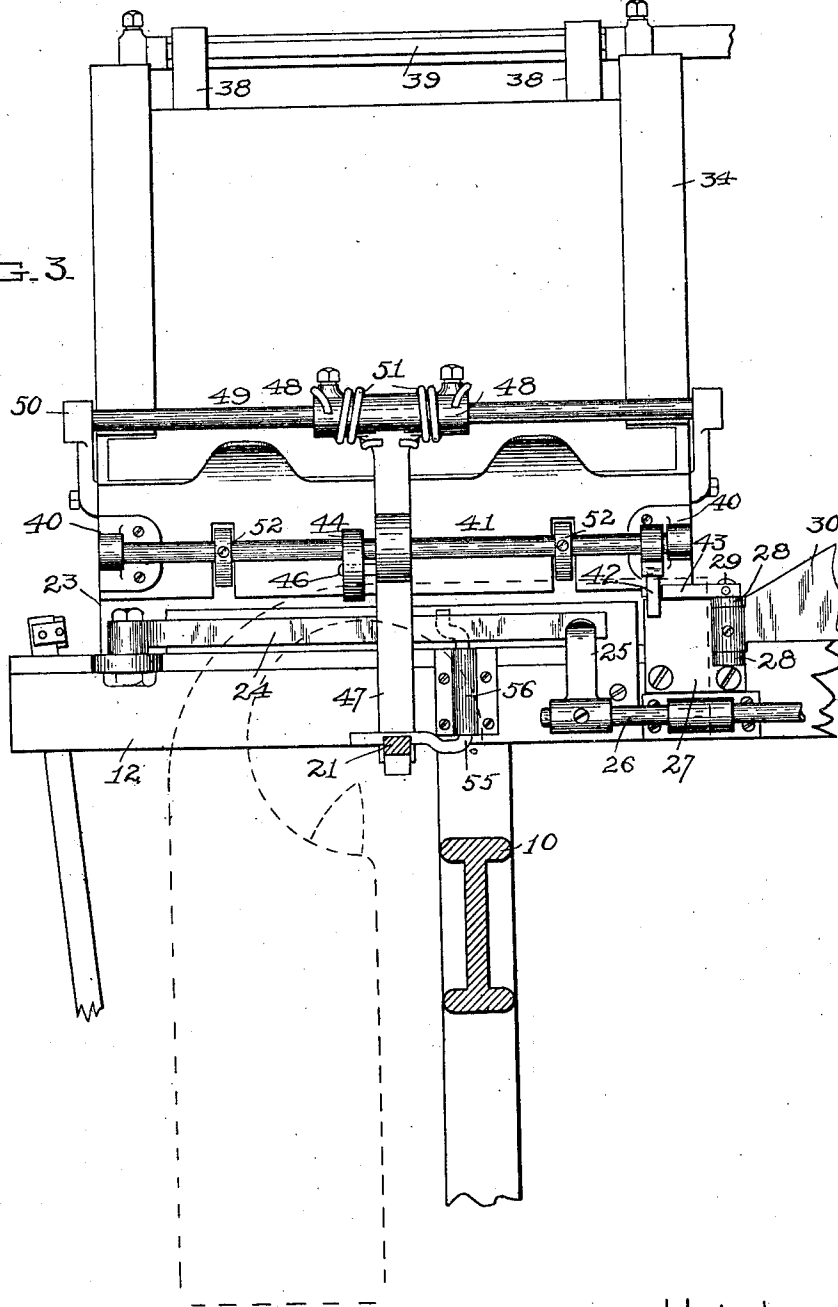
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FIG. 3.



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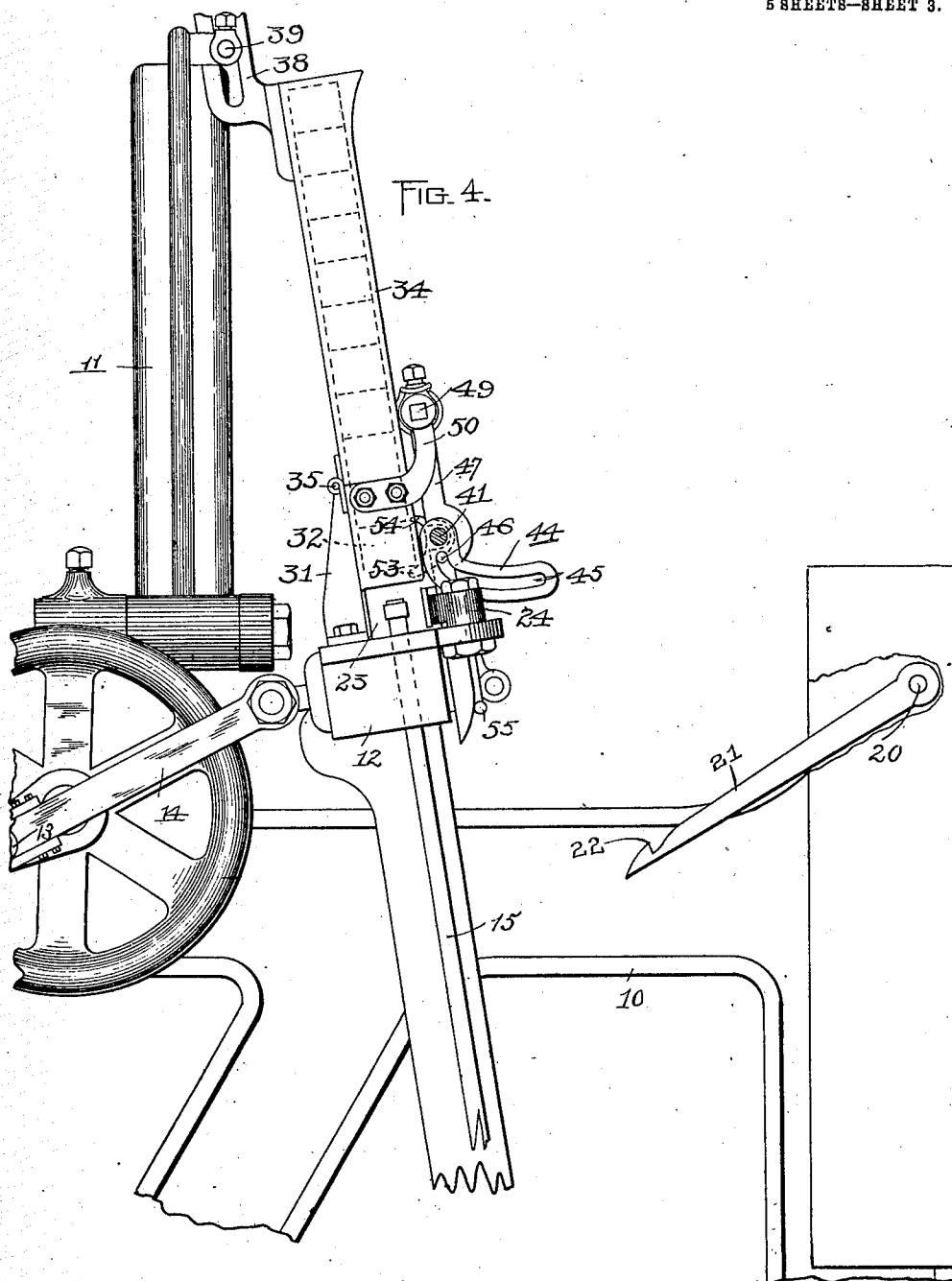
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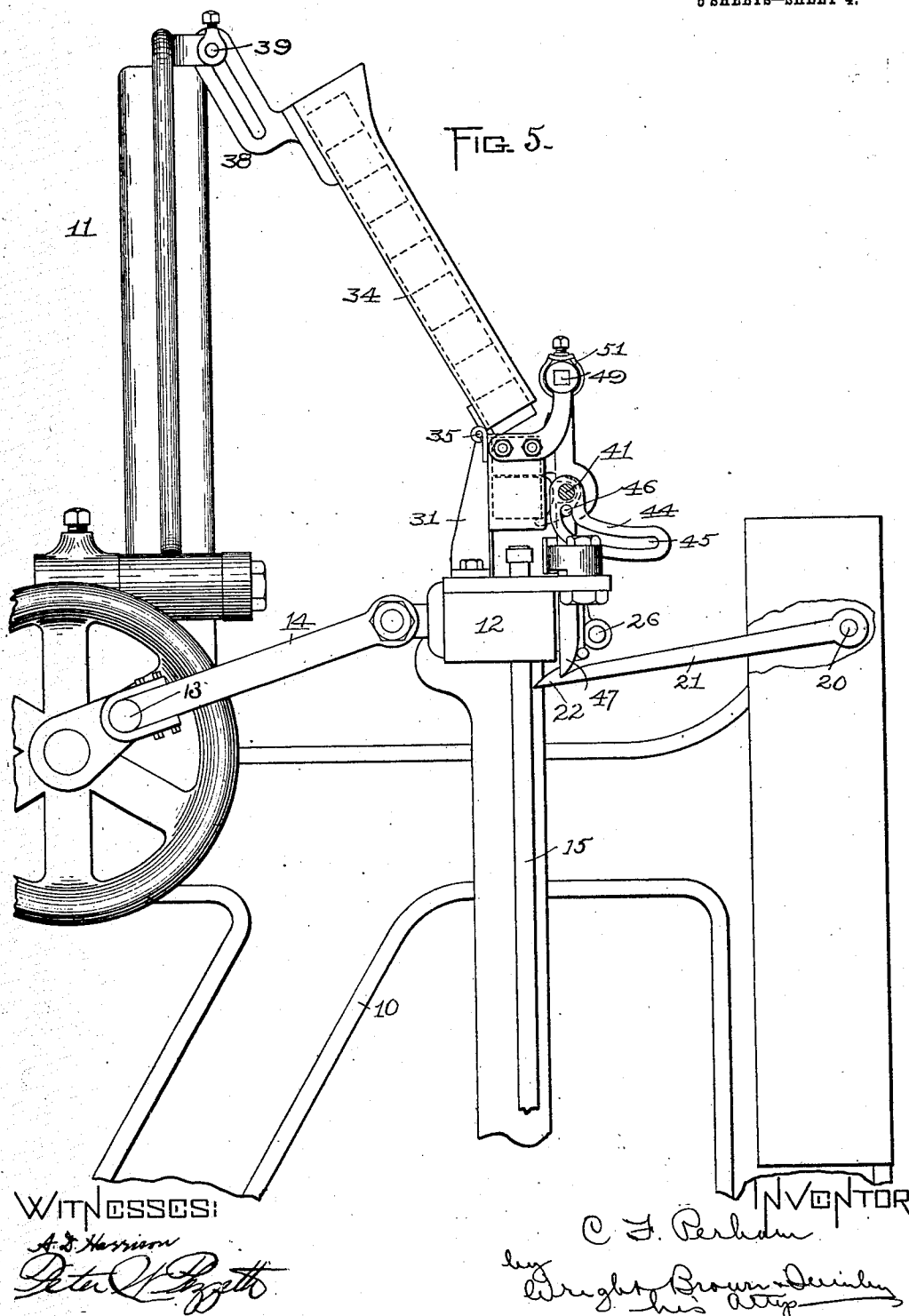
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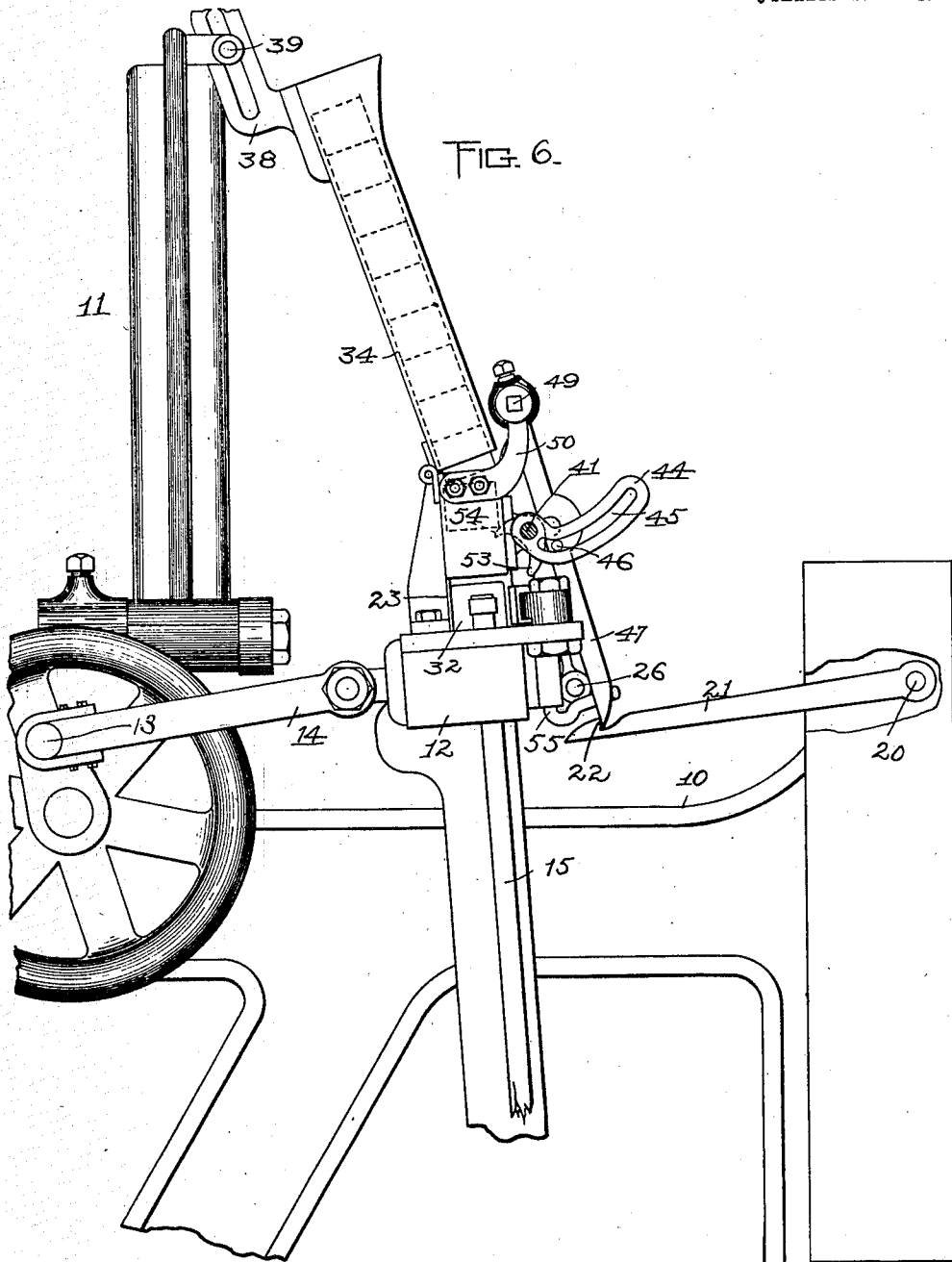
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5 SHEETS—SHEET 5.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES F. PERHAM, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO PERHAM-STICKNEY COMPANY, OF TEWKSBURY, MASSACHUSETTS, A CORPORATION OF MAINE.

WEFT-REPLENISHING MECHANISM FOR LOOMS.

No. 860,566.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed October 21, 1899. Serial No. 734,343.

To all whom it may concern:

Be it known that I, CHARLES F. PERHAM, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in

5 Weft-Replenishing Mechanism for Looms, of which the following is a specification.

This invention has relation to looms, and more particularly to mechanism employed in connection therewith for automatically displacing the shuttle when the

10 filling thread laid in the shed thereby becomes broken or exhausted, and supplying a freshly filled shuttle; and it consists in certain improvements in said mechanism as illustrated upon the accompanying drawings, described in the following specification, and particularized in the appended claims.

Referring to the said drawings, on which similar numerals of reference indicate similar parts or features,—

Figure 1 represents in front elevation a partially dismantled loom equipped with my invention. Fig. 2 represents an enlarged transverse section in a horizontal plane above one of the shuttle boxes. Fig. 3 represents the mechanism in front elevation. Figs. 4, 5

and 6 represent, respectively, in end elevation, three different positions assumed by the parts when the

25 mechanism is being operated.

Referring to the drawings, an ordinary loom is illustrated having side-standards 10, 10, connected by the arch 11. The operative parts of the loom, with the exception of the lay 12, crank 13, pitman 14, one picker stick 15, weft-fork mechanism 16, (indicated conventionally), and take-up rolls 17, 18, 19, are not shown since they have no connection with the invention, and may be of any suitable character.

The weft-fork mechanism, or filling detector, 16, is

35 connected to a suitably journaled rock-shaft 20, having an actuator or arm 21, with a hook 22 on the end thereof. Hence upon the failure or breakage of the weft or filling, the filling detector is actuated and the arm is moved from the position shown in Fig. 4, to the position shown in Fig. 6.

On the lay there is the usual shuttle-box 23, having a shuttle-binder 24, operated by a finger 25 on the rock-shaft 26, journaled on the lathe and yieldingly actuated by the mechanism shown and described in my

45 previous patent, No. 562,653, dated June 23, 1896. The finger releases the pressure on the binder prior to the pick, and restores it before the shuttle completes its flight.

Slightly in advance of the mouth of the shuttle-box,

50 and on the front side of the lay is secured a plate 27, having ears 28, 28, to receive a vertical rock-stud 29, to which is adjustably secured a switch-plate 30, which normally lies in a substantially vertical plane, parallel to the path of the shuttle, (see Fig. 2,) but which may

be moved to cross the path of the shuttle at an acute angle to deflect the shuttle from the lay to a receptacle shown in dotted lines in Fig. 3. Said receptacle is arranged to receive the shuttle when it leaves the lay and may be of any approved character. It is located at the end of the lay in proximity to the shuttle-box so that when the shuttle leaves the lay, it will enter the mouth of the receptacle and fall to the bottom thereof. The switch or deflector is actuated by mechanism which permits a new shuttle to drop into the box.

Secured upon the lay in the rear of the shuttle-box are two standards 31, 31, which support a chute, or reservoir 32, adapted to receive a plurality of shuttles 33, placed one above the other, directly over the shuttle-box, and to guide them successively into the box, as needed.

To permit a large number of shuttles being placed in the box, it is formed in two sections, the upper, 34, of which is connected to the lower by hinges 35, and to the arch by a slotted plate 38, slidingly engaging a shaft 39 on said arch.

To the front of the chute or reservoir, are secured bearings 40, 40, in which is journaled a rock-shaft 41, having a depending forked finger 42, engaging a finger 43 projecting from the top of the rocking stud 29, so that when said shaft is rocked, said switch or deflector is moved to operative position.

In order to rock the shaft, it is provided with an arm 44, having a cam slot 45, into which projects a pin 46, on a lever 47, loosely placed between two collars 48, 48, fast on a rod 49, secured at its ends in brackets 50 fastened to the ends of the chute 32. Springs 51, 51, hold the lever in the position shown in Fig. 4, whereby its pointed end may be engaged by the hook 22 of the arm 21, when the shaft 20 is rocked, and when the lay moves forward to beat the filling in the cloth. After the hook engages the said lever, it remains in engagement therewith during the entire retrograde movement of the lay and until the lay almost reaches the extreme of its forward movement, whereby the pin 46 is caused to lift the cam-arm 44 and rock the shaft 41. When the lathe comes forward, the springs 51, 51, return the lever and the rock-shaft to normal position. The hooked arm is raised by the filling detector just long enough for the lever to engage it, and then it is maintained in its raised position by the engagement of said lever therewith until the lay moves forward far enough for the lever to release it. Thus the feeding devices are operated comparatively slowly and without jerking.

On the rock-shaft 41, are two detents, or feeding dogs 52, 52, which projects through apertures into the chute or reservoir. Each dog has two ends 53, 54, which operate alternately, the former projecting under the lowermost shuttle in the chute to hold it from dropping

into the shuttle-box. The ends 54 of the dogs are adapted to slip under the shuttle immediately above the lowermost one, to hold it when the latter is dropped, though normally they are withdrawn to an inoperative position.

In order to hold the binder open against the pressure of the finger 25 when the shuttle is to be dropped in the box, I mount a two-armed rocking pin 55 in a journal 56 on the front of the lathe with the upper crank-like arm behind the binder, and its lower arm in front of the lever. Hence when the lathe swings backward after the engagement of the pointed lever with the hooked arm, the lever engages the lower arm of the pin and rocks it to force the binder outward. It remains in this position until the lathe moves forward, whereupon the end of the lower arm engages the breast beam and is thrown backward quickly to allow the binder to close.

The operation of the mechanism will be understood from the foregoing description, without elaborate explanation, for it is apparent that when the weft or filling detector is actuated, the switch or deflector-plate is swung across the mouth of the shuttle-box to guide or deflect the shuttle into the receptacle prepared for its reception, and at the same instant, a new shuttle is dropped into the box for the next pick, the pile of shuttles in the chute being held from dropping until the dogs have been returned to normal position. The weft detector is actuated at the forward beat of the lay, and hence the first portion of the backward beat causes the feeding of the new shuttle, and the actuation of the deflector to operative position, prior to the flight of the incoming operating shuttle, and its displacement by the deflector. Therefore sufficient time is allowed for the proper placing of the new shuttle in the box, without the necessity of stopping the loom, whereby said loom may be driven at an exceedingly high rate of speed.

One of the chief advantages of the invention is its extreme simplicity, and the ease with which it can be placed upon a loom of any pattern or style. The parts are few in number and may be easily replaced or repaired, and there is no danger of their operating incorrectly or out of time.

Having thus explained the nature of the invention, and described a way of constructing and using the same, although without having attempted to set forth all of the forms in which it may be made, or all of the modes of its use, I declare that what I claim is:

1. In a loom, a shuttle-box and a weft replenishing mechanism comprising an upright magazine holding a pile of shuttles permanently over the shuttle-box to permit the lowest shuttle to drop from the magazine to the said box by gravity, means for displacing the operating shuttle upon the breakage or exhaustion of the weft, and means for causing the placing of a new shuttle in the box prior to the displacement of the operating shuttle.

2. In a loom, a shuttle-box, and a weft replenishing mechanism comprising a shuttle-magazine for holding a vertical pile of shuttles permanently over the shuttle-box, means for displacing the operating shuttle upon the break-

age or exhaustion of the weft, and means for permitting a new shuttle to drop into the box prior to the flight and the displacement of the operating shuttle.

3. In a loom, a weft-replenishing mechanism comprising an upright magazine in permanent operative relation to the shuttle-box to drop the lowest shuttle therein, detent mechanism controlling the feeding of the shuttles successively, a switch or deflector in front of the mouth of the shuttle-box for deflecting the incoming shuttle from the lay, and mechanism for simultaneously actuating the detent mechanism and moving the switch or deflector to operative position, whereby the new shuttle is dropped by gravity in the box prior to the displacement of the incoming shuttle.

4. A weft-replenishing mechanism comprising a switch or deflector normally parallel to the path of the shuttle but adapted to be moved to an angle to said path to laterally deflect the operating shuttle, an upright magazine above the shuttle-box, a shuttle-detent, and means actuated by the breakage or failure of the filling for simultaneously operating said switch or deflector and said shuttle-detent.

5. A weft-replenishing mechanism comprising a deflector adapted to be moved to position to deflect the shuttle from its path, a magazine above the shuttle-box, a weft-detector, a rock-shaft connected therewith, and having a hooked arm, a second rock-shaft having shuttle-feeding devices and connected with the deflector, and a lever connected to said second rock-shaft and adapted to engage the hooked arm when the weft detector is actuated.

6. A weft-replenishing mechanism comprising a switch for laterally displacing the operating shuttle, an upright magazine above the shuttle-box, means for permitting the lowest shuttle to drop by gravity from the magazine and preventing the others from dropping, connections between the displacing switch and the feeding means, and mechanism for actuating the feeding means on the failure of the weft.

7. A weft-replenishing mechanism comprising a deflector adapted to be moved to position to deflect the shuttle from its path, a magazine above the shuttle-box, a rock-shaft journaled on said magazine and having detents for feeding the lowest shuttle in the magazine and preventing the others from dropping, connections between the rock-shaft and the deflector, and means for actuating the rock-shaft upon the failure or breakage of the weft or filling-thread.

8. A weft-replenishing mechanism comprising an upright pivoted deflector adapted to be moved to position to deflect the shuttle from its path, a magazine above the shuttle-box, a rock-shaft having devices for feeding a shuttle from the magazine into the box, connections between the rock-shaft and the deflector, a cam on said rock-shaft, a pivoted lever having a pin or projection engaging said cam, and means for operating said lever when the filling thread breaks or falls.

9. In a loom, a lay, a shuttle-box, a shuttle-binder at the front of the box, and a weft-replenishing mechanism comprising an upright shuttle-magazine connected to and movable with the lay and having its discharge over the shuttle-box, means for dropping a shuttle from the magazine into the box, a deflector arranged to deflect the incoming shuttle prior to its reaching the box and means for engaging and holding the shuttle binder in an inoperative position during the feeding of the shuttle.

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

CHARLES F. PERHAM.

Witnesses:

MARCUS B. MAY,
PETER W. PEZZETTI.