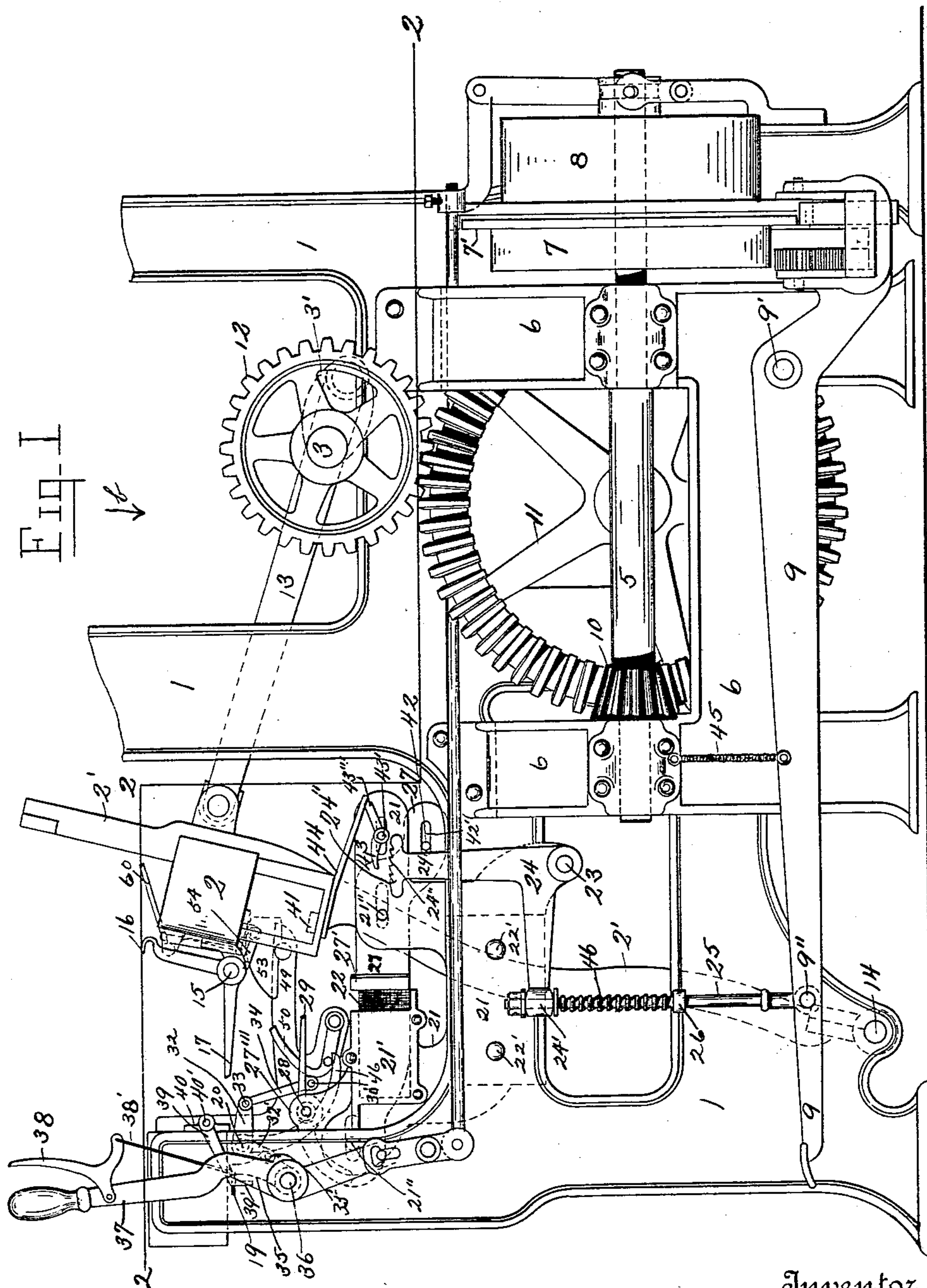


3 Sheets—Sheet 1.

No. 560,036.

Patented May 12, 1896.



2 Witnesses  
Irving H. Verry  
Wm. A. Darling

Inventor

G. F. Hutchins.

By his Attorney

John C. Dewey

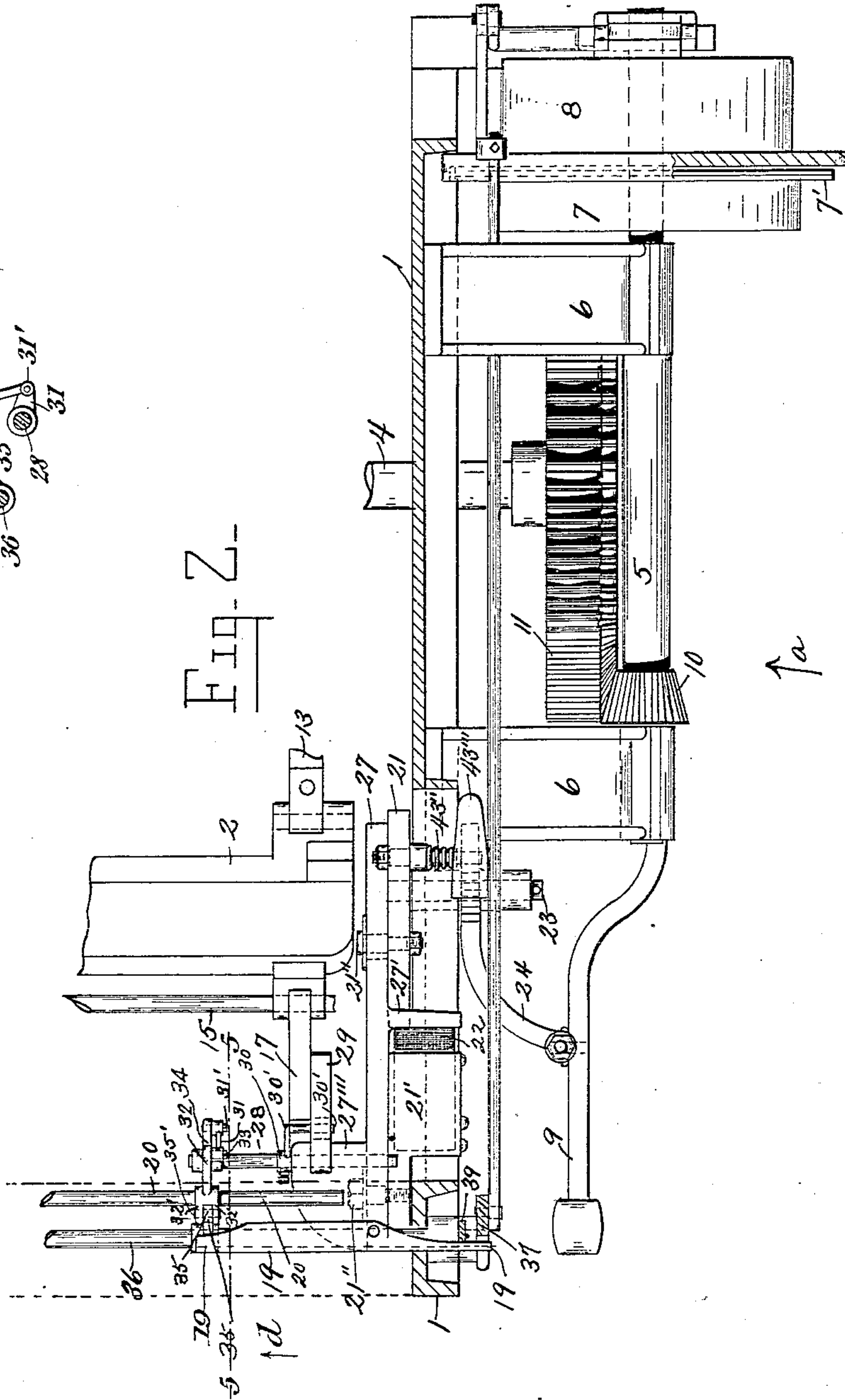
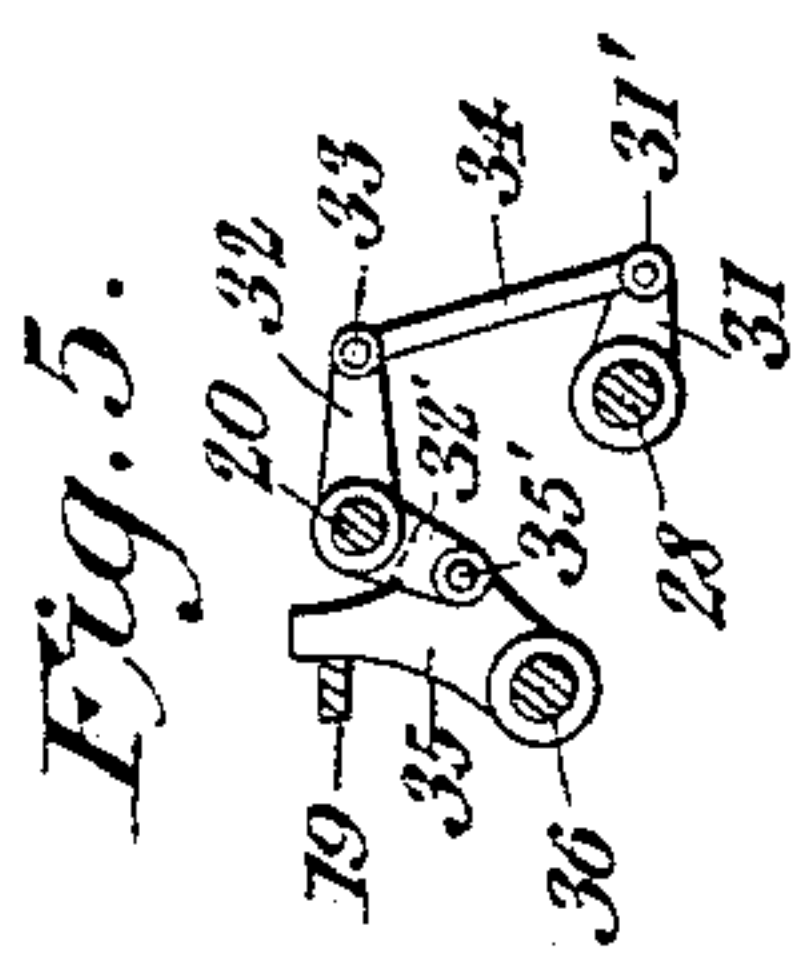
(No Model.)

3 Sheets—Sheet 2.

G. F. HUTCHINS.  
REVERSING MECHANISM FOR LOOMS.

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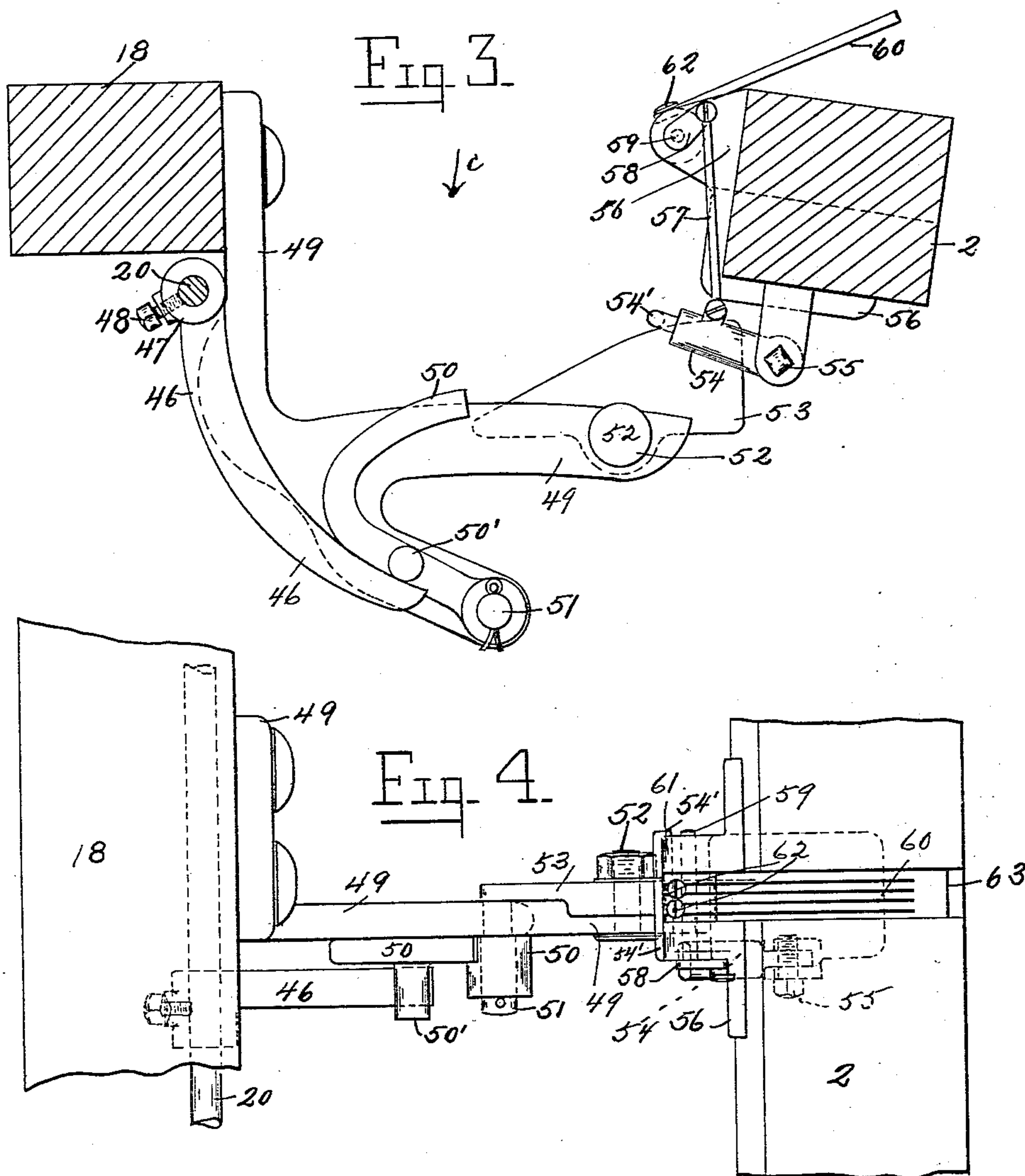
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3 Sheets—Sheet 3.

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# UNITED STATES PATENT OFFICE.

GEORGE F. HUTCHINS, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO  
THE KNOWLES LOOM WORKS, OF SAME PLACE.

## REVERSING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 560,036, dated May 12, 1896.

Application filed October 30, 1895. Serial No. 567,348. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE F. HUTCHINS, 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 Reversing Mechanism for Looms, of which the following is a specification.

My invention relates to looms, and particularly to reversing mechanism for looms; and the object of my invention is to provide means to automatically operate the reversing mechanism shown and described in my Letters Patent of the United States No. 491,776, of February 14, 1893.

My improvements for automatically operating said reversing mechanism are designed particularly for heavy looms, in which considerable power is necessary to move the lay to its rear position when the loom is stopped.

My invention consists in certain novel features of construction and operation of my mechanism for automatically operating said patented reversing mechanism, as will be hereinafter fully described, and the nature thereof indicated by the claims.

Referring to the drawings, Figure 1 is an end view, looking in the direction of arrow *a*, Fig. 2, of a loom of ordinary construction provided with the reversing mechanism described in said patent and my mechanism for automatically operating said mechanism combined therewith. The shuttle-boxes and operating mechanism are not shown. Fig. 2 is a sectional plan view of portions of the loom shown in Fig. 1, taken on line 2 2, said figure, looking in the direction of arrow *b*. Fig. 3 is a side view of the filling or weft stop-motion. Fig. 4 is a plan view of the parts shown in Fig. 3, looking in the direction of arrow *c*. Figs. 3 and 4 are shown on an enlarged scale; and Fig. 5 is a sectional view taken at a point indicated by line 5 5, Fig. 2, looking in the direction of arrow *d*, same figure.

In the accompanying drawings, 1 is the loom side; 2, the lay; 3, the crank-shaft; 4, the bottom shaft; 5, the pulley-shaft; 6, the pulley-frame; 7, the friction-pulley, provided with a friction-face 7', with which the driving-pulley 8 is moved into or out of contact to start or stop the loom by the ordinary ship-

ping mechanism shown and described in my United States Letters Patent No. 437,894.

Combined with the friction-pulley 7 and driving-pulley 8 is the reversing mechanism above referred to, fully shown and described in Letters Patent No. 491,776, above mentioned, to which reference is hereby made.

The lever 9 of the reversing mechanism is hung on a stud 9' in the pulley-frame 6 and operates the reversing mechanism, as described in said Patent No. 491,776, except that at certain periods, to be hereinafter described, said reversing mechanism is automatically operated by my mechanism combined therewith.

A beveled gear 10 is fast on the pulley-shaft 5 and drives a large beveled gear 11 fast on the bottom shaft 4. The beveled gear 11 meshes with and drives a gear 12 fast on the crank-shaft 3 in the ordinary way. A connector 13 connects the crank 3' and the crank-shaft 3 with the lay 2, the lay-sword 2' of which is pivoted at its lower end on a pin 14 in the lower part of the frame 1 in the usual manner. In front of the lay 2, secured in the usual way, is a protector-rod 15, fast upon which at each end of the loom is the binder-finger 16 and the protector-dagger 17. It will be understood that the binder-finger 16 is adapted to bear against the shuttle-binder of the shuttle-box, (not shown,) and if the shuttle is not properly boxed in the operation of the loom the binder will hold the finger 16 out and cause the dagger 17 to strike the knock-off lever 19 and stop the loom in the usual way.

In Figs. 3 and 4 are shown, on an enlarged scale, a side and plan view of the filling or weft stop-motion, which is of substantially the same construction and operation as the weft stop-motion shown and described in United States Letters Patent No. 321,226, of June 30, 1885, to which reference is made. Referring to said Figs. 3 and 4, 18 is the breast-beam, under which extends the knock-off rod 20, which has bearings in the ends of the loom in the usual way. 46 is a finger or arm projecting from a collar 47, secured on the knock-off rod 20 by a set-screw 48. A stand 49 is secured to the rear face of the breast-beam 18 and extends inwardly and



has a knock-off arm or finger 50, pivoted at one end on a stud 51 at the lower end of said stand 49 and provided with a knob or projection 50', adapted to rest on the finger 46.

5 Secured to the horizontally-projecting end of the stand 49 by a bolt 52 is a shoe or track 53, on which is adapted to rest and travel, as the lay moves, the horizontal bent end 54' of the dagger 54, which is pivoted at its inner end

10 on a bolt 55 in the lower end of the stand 56, bolted to the lay 2. A connecting-rod 57 is pivoted at one end to the dagger 54 and at its other end to the crank-arm 58 on the shaft 59, which has bearings in said stand 56 at

15 the front of the lay. The shaft 59 carries the feelers 60, secured thereto by a hub 61 and set-screws 62. The feelers 60 extend over a transverse slot 63 cut in the top of the lay, and in case they are not held up by the

20 filling or weft they will drop into said slot to automatically stop the loom by means of the filling stop-motion above described, for the forward motion of the lay will cause the end 54' of the dagger 54, which is dropped by the

25 lowered position of the feelers 60, to strike against the end of the arm or finger 50 and force down said arm and cause the stud 50' thereon to move back the finger 46 on the knock-off rod 20 and revolve said rod to stop

30 the loom in the well-known way and automatically operate my reverse mechanism, as will be hereinafter described.

I will now proceed to describe the construction and operation of my supplemental mechanism combined with said patented reverse mechanism to automatically operate the same.

A stand or frame 21 is secured to the loom side 1 by bolts 22' and contains the rubber-bunter pocket 21', in which is secured the rubber bunter 22. Hung on a stud 23 in the lower part of the frame 21 (see Fig. 1) is the angle-lever 24, which is connected to the lever 9 of the reverse mechanism by the rod 25,

45 which extends at its upper end loosely through a hub 24' on one end of said lever 24. The other end of the rod 25 is pivotally attached at 9'' to the front end of the lever 9. An expansible spiral spring 46 is mounted on the rod 25, and bears at its upper end against the hub 24' of the lever 24, and at its lower end against a collar 26 on the rod 25. The spring 46 is of sufficient tension to communicate motion from the angle-lever 24 to the lever 9,

55 and thus furnishes a yielding connection between said lever 24 and lever 9, and not a rigid connection.

Attached to the inside of the frame 21 by bolts 21'' is a sliding frame 27, which is provided with a projection or lug 27', (see Fig. 2,) which extends in front of and in contact with the rubber bunter 22. Said frame 27 at its front upper portion is provided with a hub 27'', in which is mounted a shaft 28, on which

65 a dagger 29 is loosely supported at one end, to move independently of said shaft. The hub 30 of a finger 30' is fast on the shaft 28, and

said finger 30' extends under the dagger 29 and acts to raise said dagger at the proper time. The inner end of an arm 32 is fast on the knock-off rod 20. Said arm 32 carries a stud 33, to which one end of the connector 34 is attached. The other end of said connector 34 is attached to a stud 31' in the hub 31, which is fast on the shaft 28. The arm 32 is also provided with a rearwardly-extending forked end 32', (see dotted lines, Fig. 1, and also Fig. 5,) which is pivotally attached to a stud 35' in finger 35, loose on shipper-rod 36, which is provided with the shipper-handle 37, carrying the auxiliary handle 38 hung thereon. A connector 38' connects the auxiliary handle 38 with the finger 39, hung on a pin 40', fast in the stand 40. The finger 39 has a face 39', which is in contact with the outer end of the knock-off lever 19, so that when the operator grasps the auxiliary handle 38, in connection with the shipper-handle 37, to start the loom the knock-off lever 19 will swing its inner end against the finger 35, loose on a shipper-rod 36, and cause the dagger 29, through forked end 32', arm 32, and connector 34, to be raised out of the path of the block 41, which is fast on the lay 2, as the lay beats up. After the first pick of the lay the filling will be under the feeler-wires and hold said wires up in the usual way to prevent the operation of the stop filling motion and the engagement of the dagger 29 with the block 41. A pin 42 is secured in a slot 42' in the inner end of the sliding frame 27, (see Fig. 1,) and as said frame 27 moves forward the pin 42 will engage the angle-lever 24 and move said lever forward to communicate motion, through spring 46, to the lever 9 of the reverse mechanism. The pin 42 also acts as a stop to limit the backward motion of the lever 24 when released by the pawl 43.

In the stationary frame 21 is secured a stud 43', on which is hung a pawl 43. A spring 43'' (see Fig. 2) is coiled around said stud 43', and acts to cause the pawl 43 to engage the teeth or notches 24'' in the upper end of the upright arm of the angle-lever 24, to hold said lever in its forward position on the return of the sliding frame 21. The pawl 43 has a rearward extension or heel 43''', which will be engaged by the end of the arm 44, secured upon the under side of the lay, upon the rearward motion of the lay, to disengage the pawl 43 from the teeth or notches 24'' in the upper end of the lever 24, and allow said lever to return to its upright position. (Shown in Fig. 1.)

From the above description, in connection with the drawings, the automatic operation of the reverse mechanism on the breaking of the filling, and the operation of the filling stop-motion mechanism, will be readily understood by those skilled in the art.

The operation of the filling stop-motion (shown in Figs. 3 and 4) causes the knock-off rod 20 to rotate, and through finger 35, operated by forked arm 32', the knock-off lever 19 to operate to move the shipper-rod 36 and stop



the loom on the forward beat of the lay in the usual way.

The rotation of the knock-off rod 20 in the operation of stopping the loom allows the dagger 29 to drop down, the lifter-finger 30' being lowered by the rotation of the shaft 28, through connector 34 and arm 32, so that as the lay moves forward the block 41 will engage the end of the dagger 29 and cause the sliding frame 27 to move forward and compress the bunter 22, and the pin 42 on said frame 27 will engage the angle-lever 24, and rock said lever 24 on its pivot-pin 23, and through the spring 46 move down the front end of the lever 9 and bring into action the reverse mechanism mounted at the opposite end of said lever, to cause said reverse mechanism to operate, as set out in said Patent No. 491,776, and move the lay to its rear position, as shown in Fig. 1.

The forward motion of the lay will release the pawl 43 from the arm 44 and allow said pawl to engage the teeth 24'' in the upper end of lever 24 and hold said lever in its forward position to operate the reverse mechanism, while the sliding frame 27, by the expansion of the bunter 22, will return to its rear position immediately as the lay starts to move back. The continued backward movement of the lay causes the arm 44 to engage the heel 43''' of the pawl 43 and disengage said pawl from the teeth in the lever 24, as above described, to allow said lever to return to its upright position through the action of a spring 45.

It will be understood that the forward movement of the sliding frame 27 is very slight, but is still sufficient to communicate, through angle-lever 24 and spring 46 on the rod 25, sufficient movement to the front end of the lever 9 to bring into operation the reverse mechanism supported on said lever.

The advantages of automatically operating my patented reverse mechanism will be readily appreciated by those skilled in the art.

It will be understood that the details of construction of some of the parts of the mechanism for automatically operating the reverse mechanism 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 loom, the combination with mechanism, substantially as described, for reversing the loom to move back the lay, a pivoted lever forming a part of said mechanism, of filling stop-motion, and mechanism for automatically operating said lever upon the breaking of the filling, substantially as set forth.

2. In a loom, the combination with the filling stop-motion, connections from the knock-off rod of said motion to a dagger carried on a sliding frame mounted on a stationary frame on the loom, and said knock-off rod, dagger, sliding frame and said stationary frame, said sliding frame having a projection in engagement with a stationary yielding bunter, and said bunter, and a block on the lay adapted to engage said dagger on the forward beat of the lay, upon the operation of the filling stop-motion, of connections, intermediate said sliding frame and the lever of the reverse mechanism, which moves back the lay, and said lever, and reverse mechanism, of the character described, substantially as set forth.

3. In a loom, the combination with mechanism of the character described for reversing the loom to move back the lay, a pivoted lever forming a part of said mechanism, of mechanism for automatically operating said pivoted lever to operate the reverse mechanism, said mechanism consisting of an angle-lever, and connections from said angle-lever to said pivoted lever, a sliding frame carrying an arm or projection in engagement with a stationary yielding bunter and said bunter, and a connection between said angle-lever and sliding frame to operate said angle-lever, said sliding frame carrying a dagger adapted to be engaged by a block on the lay on the forward beat of the lay, and means for operating said dagger, said means connected with and operated by the filling stop-motion, and said filling stop-motion, substantially as set forth.

GEORGE F. HUTCHINS.

Witnesses:

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M. J. GALVIN.