

(No Model.)

C. HIRST.
LET-OFF MECHANISM FOR LOOMS.

No. 410,835.

Patented Sept. 10, 1889.

Fig. 1.

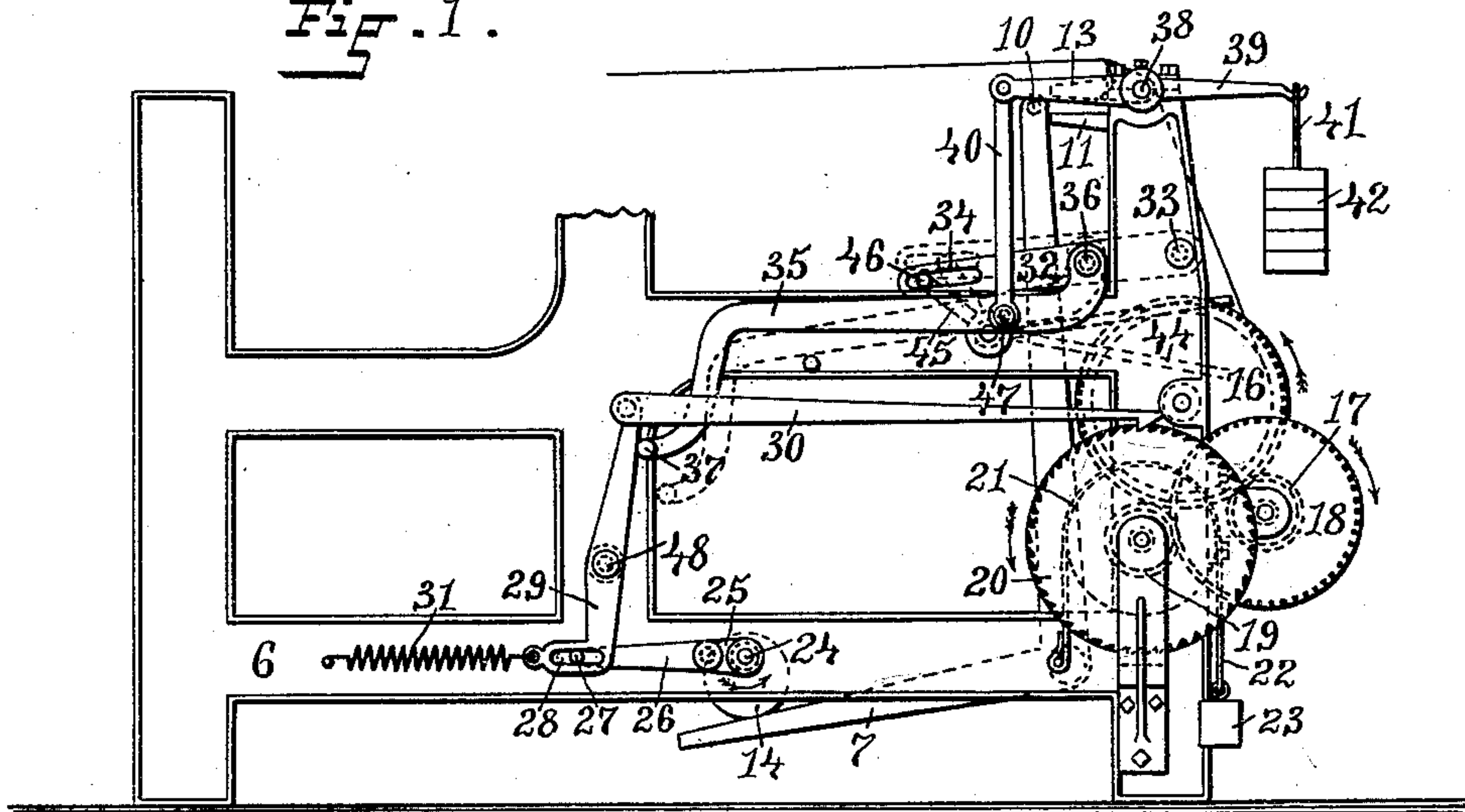
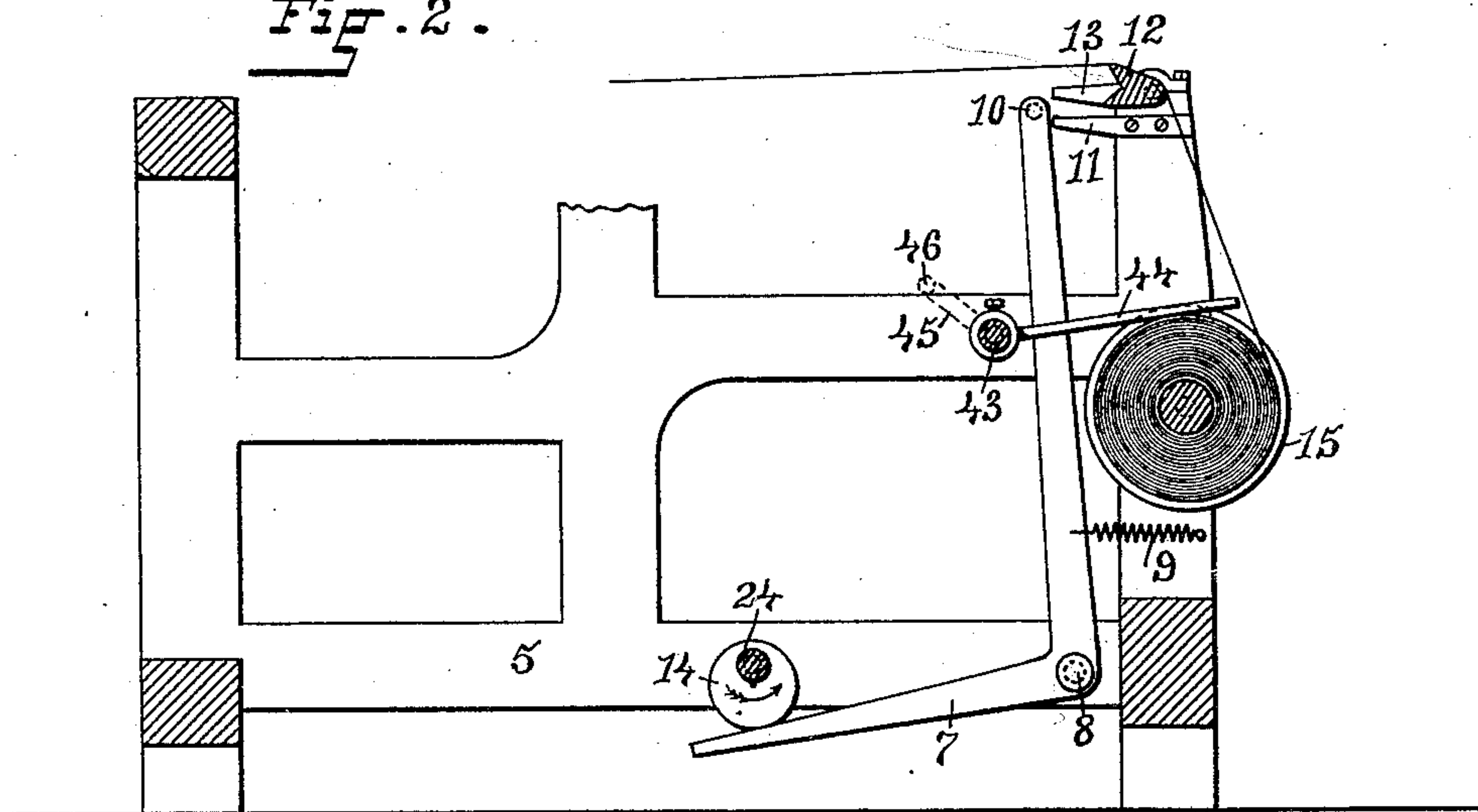


Fig. 2.



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LET-OFF MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 410,835, dated September 10, 1889.

Application filed March 18, 1889. Serial No. 303,662. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HIRST, of Woonsocket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Let-Off Mechanism for Looms, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to devices for regulating the supply of warp to looms, so as to at all times maintain a uniform tension on the warp.

To the aforesaid purpose my invention consists in the construction and combination of the several parts of the device, as will be more fully set forth hereinafter.

In the accompanying drawings, Figure 1 is a side view of a loom-frame with my improved device attached thereto. Fig. 2 is a sectional view of the inner face of a side frame, showing part of my device secured thereto and the cam for operating the same.

In the said drawings like numbers of reference designate corresponding parts throughout.

Referring to the drawings, the numbers 5 6 designate the side frames of a loom; 7, an L-shaped lever, which is pivoted on the stud or pin 8. One end of the spring 9 is attached to the lever 7, the other end being secured to the side frame 5. By means of this spring the L-shaped lever is pulled outward or toward the back of the loom. On the upper end of the lever 7 is secured the stud 10. To the side frame 5 is secured the arm 11, and projecting from the whip-roll 12 is the arm 13, the lower face of which is beveled, as shown. The cam 14, mounted on and revolving with the picker-shaft 24, is so timed that it serves to depress the lower arm of the L-shaped lever, and thereby withdraw the stud from between the projecting arms 11 and 13 when the loom is in the act of taking up the woven cloth. When the large side of the cam has passed, the spring will act to move the upright arm of the L-shaped lever and force the stud between the two arms 11 and 13, and thereby put a certain amount of strain upon the warp during the throwing of the shuttle.

The warp-beam 15 is supported in suitable bearings formed on the side frames 5 and 6, and carries on one end the gear 16, which intermeshes with the pinion 17, secured to the same shaft as the gear 18. The gear 18 intermeshes with the pinion 19, secured to the same shaft as the ratchet-gear 20. On this same shaft the friction-pulley 21 is mounted. The strap 22, secured at one end to the side frame 6, passes up over the friction-pulley 21 and has the weight 23 at its free end. The object of the friction-pulley and strap is to prevent any movement of the gears by reason of the strain on the warp. All the shafts of the gears are mounted in suitable supports secured to or formed on the side frame 6.

On the end of the picker-shaft 24 extending through the side frame 6 is attached the crank-arm 25, which carries the link 26, provided with the pin 27, working in the slot 28, formed in the lower end of the lever 29. The lever 29 is pivoted on the pin 48, and carries at its upper end the rack-arm 30, having one or more teeth at its free end, which intermesh with the ratchet-gear 20. The spring 31, one end of which is attached to the side frame 6 and the other to the lower end of the lever 29, serves to draw the lower end of the lever 29 forward and project the upper end, and with it the arm 30, backward. The lever 32 is provided with the slot 34, and is pivoted at 33 to the side frame 6. The bent lever 35 is pivoted at one end at 36 to the lever 32, the free end of the lever 35 being bent downward and forward, and is provided with the projection or stop 37, which regulates the inward movement of the lever 29 according as the lever 35, and with it the stop 37, is lifted or lowered. The rod 43 extends across the loom and is supported at its ends in suitable bearings formed on the side frames 5 and 6. The follower 44 is secured to the rod 43, and at the end supported in the side frame 6 is secured an upwardly-extending arm 45, which is provided with the stud or pin 46, which stud or pin works in the slot 34 in the arm 32.

On the shaft 38 of the whip-roll 12 is secured the balanced lever 39, which is pivotally connected to the bent lever 35 at one end by the link 40 at 47, and carries the weight-holder 41 and weights 42 at the opposite end.

The operation of the device is as follows: A full beam having been fixed in the loom, the warp is passed up over the whip-roll, and thence through the several parts of the loom to the cloth. All the parts of the device will be in the relative positions shown in full lines in Fig. 1, the follower 44 resting on the top of the full beam of warp. As the process of weaving the cloth goes on it is necessary to supply sufficient warp, which is accomplished as follows: The picker-shaft 24 being revolved, the crank-arm 25 will revolve with it, carrying the link 26 backward, and causing the pin 27, moving in the slot 28, to bring up against the end of the slot and pull the lower part of the lever 29 backward against the action of the spring 31 and move the upper end of the lever 29 outward, and with it the rack-arm 30, thereby moving the ratchet-gear 20 one or more teeth, and, through the intervening gears and pinions 19 18 17 16, the warp-beam, and letting off the required amount of warp. As the warp is used, the follower 44 will gradually descend, bearing always on the warp of the warp-beam, and the several parts of the device will gradually assume the position shown in dotted lines—that is, the follower having followed the warp down, the lever 32 will have assumed the position shown in dotted lines by reason of its connection to the follower through the arm 45 and the pin 46, working in the slot 34, and by reason of the bent arm 35 being pivoted at 47 (which is practically a stationary pivot, only moving to accommodate the amount of strain put on the warp through the whip-roll by reason of the weights 42) the end secured to the lever 32 will have moved upward with said lever, and the free end carrying the stop 37 will have moved downward, thus allowing more movement to the lever 29, and consequently the taking up of more teeth on the ratchet-gear 20 by the rack-arm and the delivery of the required quantity of warp to the loom.

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

1. The combination of the follower 44, shaft 43, and arm 45 with the levers 32 35 29, link 26, operated by the picker-shaft 24 to oscillate the lever 29, the shaft 24, crank-arm 25, rack-arm 30, ratchet-gear 20, pinion 19, intermediate pinion 17, and the gear 16, all substantially as herein shown and described.

2. The combination of the L-shaped lever 7, provided with the stud 10, the spring 9, arm 11, whip-roll 12, provided with the arm 13, link 40, balance-lever 39, weight-holder 41, and weights 42, with the follower 44, shaft 43, arm 45, levers 32 35 29, shaft 24, cam 14, crank-arm 25, link 26, rack-arm 30, ratchet-gear 20, pinion 19, intermediate gear 18, intermediate pinion 17, and the gear 16, all substantially as herein shown and described.

3. The cam 14, secured to the shaft 24, the L-shaped lever 7, provided with the stud 10, the spring 9, the arm 11, and the whip-roll 12, provided with the arm 13, in combination with the follower 44, the shaft 43, carrying the arm 45, provided with the stud 46, the lever 32, pivoted to the side frame and provided with the slot 34, in which the stud 46 works, the bent lever 35, connected to the lever 32 and provided with the stop 37, the lever 39, carrying the weight-holder 41 and weights 42, supported on the whip-roll shaft 38 and connected to the bent lever 35 by the arm 13 and link 40, the rack-arm 30, the lever 29, provided with the slot 28, the spring 31, the link 26, connected to the crank-arm 25 and carrying the stud 27, the crank-arm 25, the gears 16, 18, and 20, the pinions 17 and 19, and the friction-pulley 21, strap 22, and weight 23, all arranged and operating substantially as herein shown and described.

In witness whereof I have hereunto set my hand.

CHARLES HIRST.

Witnesses:

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