

(No Model.)

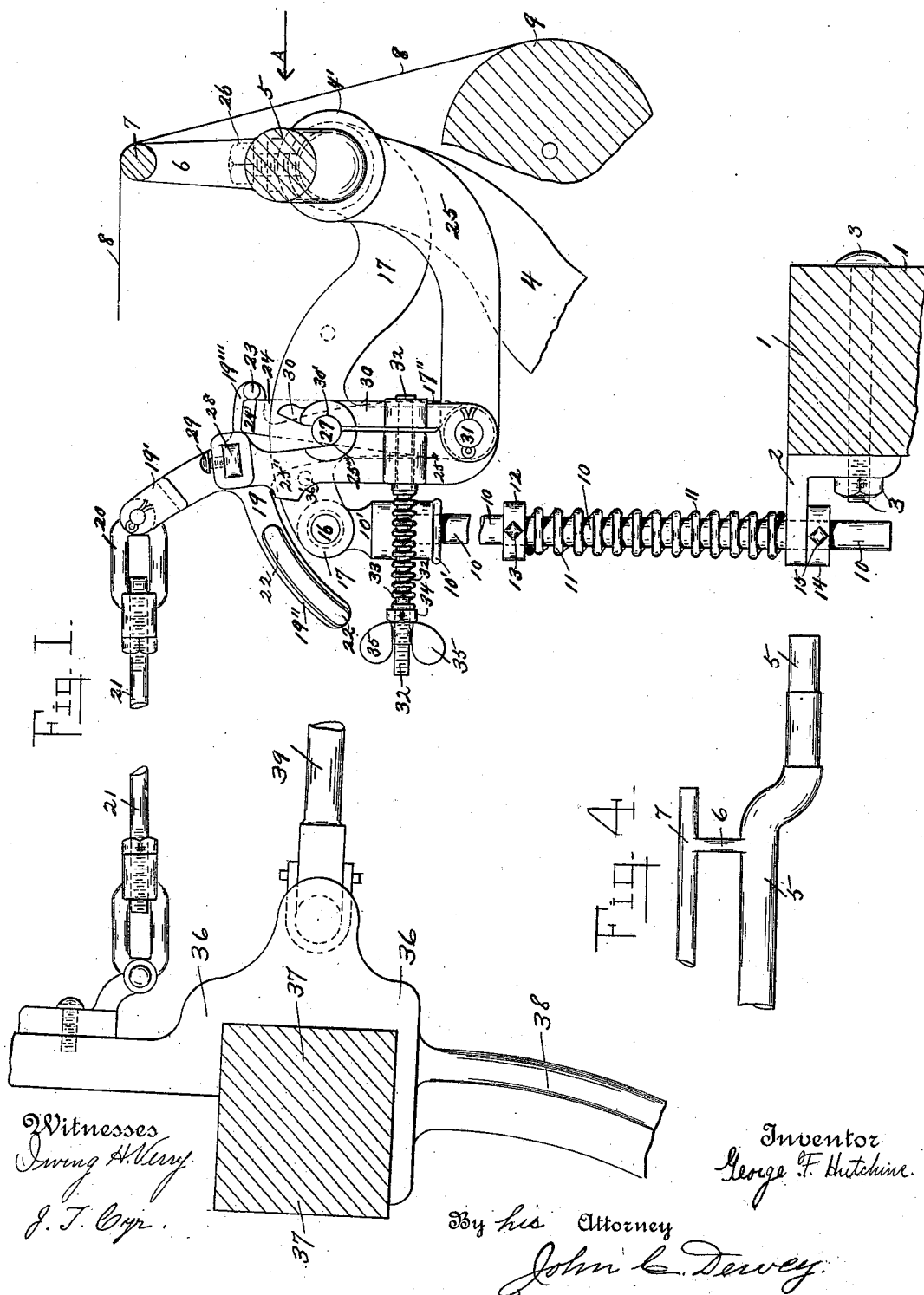
3 Sheets—Sheet 1.

G. F. HUTCHINS.

WARP SLACKENING MECHANISM FOR LOOMS.

No. 523,574.

Patented July 24, 1894.



(No Model.)

3 Sheets—Sheet 2.

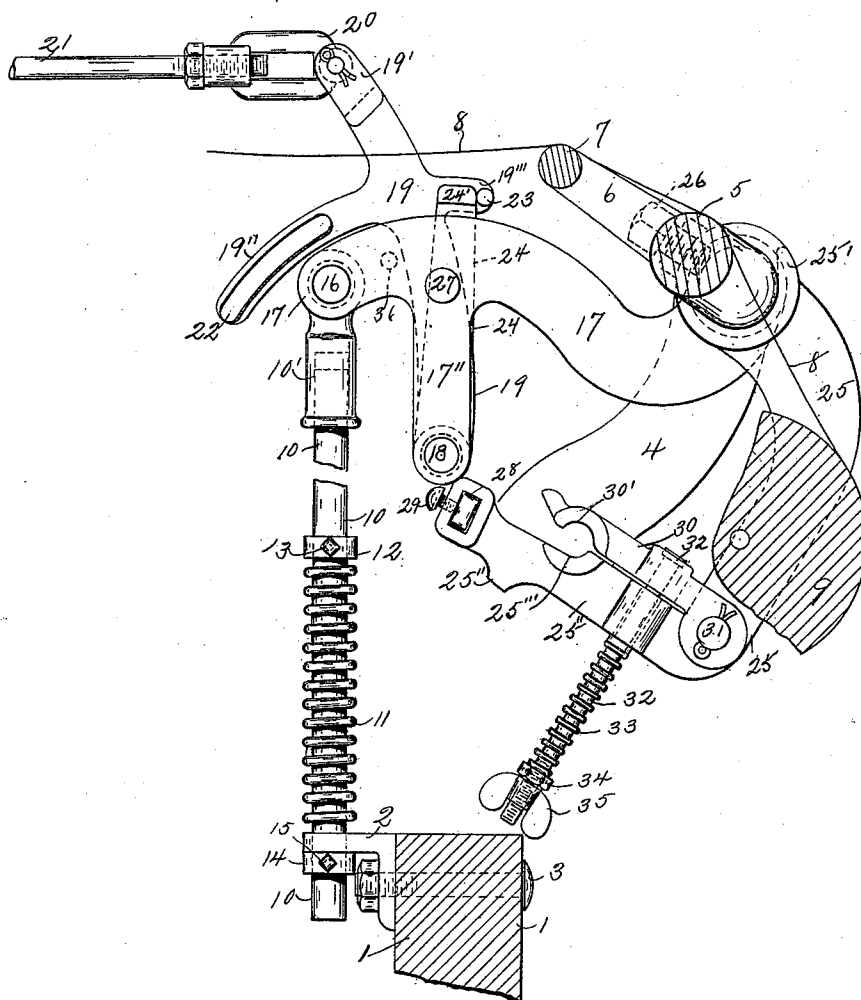
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Fig. 2.



Witnesses

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By his Attorney

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(No Model.)

3 Sheets—Sheet 3.

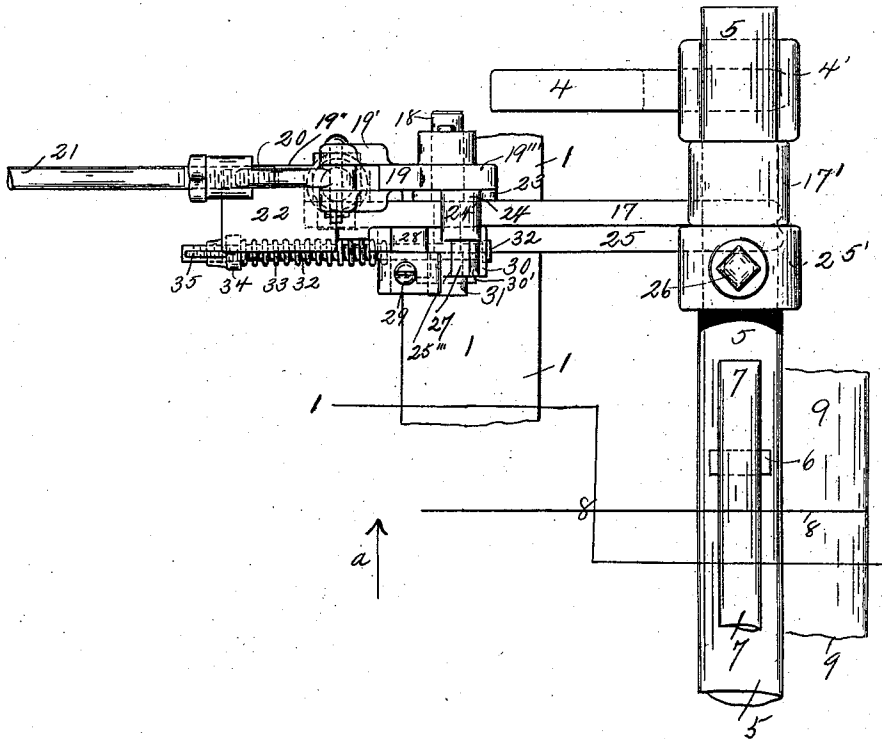
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Fig. 3.



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# UNITED STATES PATENT OFFICE.

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

## WARP-SLACKENING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 523,574, dated July 24, 1894.

Application filed December 28, 1893. Serial No. 494,977. (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 Warp-Slackening Mechanism for Looms; and I do hereby declare that the following is a full, clear, and exact description thereof, which, in connection with the drawings making a part of this specification, will enable others skilled in the art to which my invention belongs to make and use the same.

My invention relates to looms, and more particularly to an auxiliary attachment, to be applied to light and quick running looms of ordinary construction, and used in addition to the ordinary protecting and stop mechanisms, to prevent the breaking of the warp threads, by one or more shuttles stopping in their passage across the lay.

It frequently happens in drop box looms, that by reason of the breaking or catching of the picker, shuttles are placed in the wrong box, and when, for any reason one shuttle fails to leave its box at the proper time, a shuttle coming from the other side of the loom, not being able to enter the right box, will remain in the shed or warp, so that when the lay beats up the shuttle will cause a breakage of the warp threads, before the loom stops.

The object of my invention is to prevent the breaking of the warp threads, above referred to, and to provide an auxiliary mechanism, combined with the ordinary mechanism of the loom, to cause the warp to be automatically slackened, by the tension on the warp, as the lay beats up, in case one or more shuttles stop in their passage across the lay.

My invention consists in certain novel features of construction and operation of my auxiliary attachment, above referred to, as will be hereinafter fully described and the nature thereof indicated by the claims.

I have shown in the drawings my auxiliary attachment, with sufficient connecting parts to illustrate the nature of my invention.

Referring to the drawings:—Figure 1 is a sectional elevation of my auxiliary attachment showing the parts thereof in their normal or working position, taken on line 1, 1,

Fig. 3, looking in the direction of arrow *a*, same figure and also showing a portion of the lay sword, and lay, and connections thereto. Fig. 2 corresponds to Fig. 1, but shows my auxiliary attachment after the same has been operated to slacken the warp. The lay sword, and lay, shown in Fig. 1, are not shown in this figure. Fig. 3 is a plan view of the parts shown at the right in Fig. 1. The lay sword, and lay shown in Fig. 1, are not shown in this figure, and Fig. 4 is, on a reduced scale, one-half size, a detail of one end of the back roll and rod, looking in the direction of arrow *A*, Fig. 1, showing the curved or bent construction of the end thereof.

In the accompanying drawings, 1 is the bottom wooden girt, 2 is a stand bolted thereto by a bolt 3, and 4 is the upper portion of one of the back roll stands, at one end of the loom, which stand is secured at its lower end to the loom side, not shown.

5 is the back roll, supported at its end in the bearing 4' on the stand 4, and adapted to rock therein. Said back roll 5 has in this instance its end curved, or bent downwardly, as shown in detail, Fig. 4, which is an ordinary construction of the back roll. 6 is an arm extending up from said roll 5 and supporting at its upper end one end of the rod 7, over which the warp 8, from the warp beam 9 passes, all in the usual way.

I will now proceed to describe my auxiliary attachment, located at one end of the loom, and combined with the parts of the loom above mentioned.

In the stand 2, attached to the bottom girt 1, is loosely mounted, to have a vertical motion therein, the upright spring actuated rod 10. Said rod 10 is supported in the stand 2, and has a yielding motion therein, by means of the spiral spring 11 bearing at its lower end upon the upper surface of said stand 2, and at its upper end against a collar 12 adjustably secured to the rod 10, by a set screw 13. A collar 14 is adjustably secured to the lower end of the rod 10, by a set screw 15, and extends below the stand 2, to prevent the rod 10 from being raised out of said stand. The upper end 10' of the spring actuated rod 10 is pivotally connected by a pin 16 with one end of the arm 17. The other end of said

arm 17 is provided with a hub 17', loosely mounted on the back roll 5, see Fig. 3. On the lower end of the downward projection 17'' of the arm 17, is pivoted, on a pin 18, a rocking locking arm 19, the upper end 19' of which is pivotally connected, through a link 20, with the connector 21, leading to and connected with the lay, 36, see Fig. 1, carrying the lay beam 37, supported on the lay sword 38. The connector 39 connects the lay with the crank shaft, not shown, through which motion is communicated to the lay, in the ordinary way. The rocking locking arm 19 has the forward extension 19'' provided with a side flange, or horizontal lip 22, extending out from one side thereof, for the purpose to be hereinafter stated. Said locking arm 19 has also the rearward projection 19''', provided with a stud 23, adapted to engage the upper end of the swinging arm 24, pivoted at its lower end on the pin 18, and provided at its upper end with a side flange, or horizontal lip 24', extending out in the same direction as the lip 22 on the locking arm 19, see Fig. 3, for the purpose to be hereinafter stated.

Combined with the back rod 7 is a clamping device for holding said rod in its normal position, as shown in Fig. 1, except when a sufficient tension is put upon the warp, by a shuttle stopping in its passage across the lay, to cause said clamping device to operate to release the back rod, and allow the same to rock inwardly, to slacken the warp, as shown in Fig. 2. Said clamping device consists of an arm 25, provided at one end with a hub 25', mounted on the back roll 5, and secured thereto by a set screw 26, see Fig. 3. The other end 25'' of the arm 25, extends up at substantially right angles to the straight portion thereof, and is provided with a recessed portion 25''' adapted to engage one side of a stud 27 extending out from the arm 17. The extreme end of the portion 25'' of the arm 25 has an opening therein, in which is secured a block 28, by a set screw 29. The block 28 extends out from one side of the end 25'' of the arm 25, to form a projecting surface to extend over the lip 24' of the swinging arm 24, and also over the lip 22 on the rocking locking arm 19, as said arms are rocked on their pivot point.

Combined with the end 25'' of the arm 25, to form the movable jaw for engaging, in connection with said end 25'', the stud 27, is an arm 30, pivoted at its lower end on a stud 31 on the arm 25, and provided at its upper end with a recessed portion 30', adapted to engage, in connection with the recessed portion 25''' of the end 25'', the stud 27 on the arm 17. The arm 30, forming the movable clamping jaw, is yieldingly connected with the end 25'' of the arm 25, forming the stationary clamping jaw, by a spring actuated rod 32 extending loosely through hub portions on the end 25'' and arm 30, and headed at its inner end to prevent it from being drawn out from said hubs.

The rod 32 is encircled by a spiral spring 33, one end of which bears against the edge of the end 25'' of the arm 25, and the other end against an adjustable nut 34, held by the thumb nut 35, screwed on to the outer end of said rod 32. On the arm 17 is a pin 36', which limits the motion of the swinging arm 24 away from the pin 23.

From the above description, in connection with the drawings, the operation of my auxiliary attachment, will be readily understood by those skilled in the art.

The clamping device above referred to is spring actuated, and is not a positive device for holding the back rod 7 in its upright position, and in order to have the device act quickly at the proper time, a comparatively light tension is put upon the clamping arm 30, so that the ordinary tension of the warp 8, passing over the back rod 7 might rock, or move inward the said back rod, and cause the arm 30 to be disengaged from the stud 27, to release the clamping mechanism.

In order to prevent the accidental releasing of the clamping mechanism, and the slackening of the warp, except at the proper time, I provide my auxiliary attachment, which operates to positively lock and prevent the releasing of the clamping mechanism, to slacken or loosen the warp, except when the lay on its forward movement reaches a point where a shuttle remaining in the warp would break out the warp, unless the warp was immediately slackened or loosened; and at this point my locking mechanism for the back rod clamping device is so constructed, that the clamping device is free to release the back rod and slacken the warp.

The length of the lip 22 on the rocking arm 19, in connection with the lip 24' on the swinging arm 24, is a little less than the distance covered by the movement of the lay; and on the forward throw of the lay the lip 22 extends under the block 28, to prevent the disengagement of the clamping device, as the lay beats up, and in case there is no shuttle remaining in the warp, the continued forward motion of the lay moves forward the swinging arm 24, by the engagement of the stud 23 therewith, to bring the lip 24' under the block 28, to lock the clamping device during the remainder of the forward motion of the lay. After the lip 22 has passed from under the block 28, and before the lip 24' passes thereunder, in case a shuttle remains in the warp, the lay is at that point in its forward movement, where the tension on the warp will be sufficient to disengage the clamping device, and at this time the block 28 is free to drop, to release the back rod and loosen or slacken the warp. On the return movement of the lay, the lip 24' bearing against the inner end of the lip 22, is moved backward to pass under the block 28, until the swinging arm 24 has passed by its center, when it will drop back to engage the pin 23, preparatory to again being moved forward on the forward beat of

the lay, to operate, in connection with the lip 22, to lock the clamping device, as above described.

It will be understood that the details of construction of some of the parts of my auxiliary attachment, may be varied somewhat 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 a vertical moving spring actuated rod, an arm pivotally attached thereto at one end, with its other end loosely mounted on the back roll, a swinging arm pivotally supported on said arm, and provided with a side flange at its upper end, and moved by a rocking locking arm, and said rocking locking arm, also pivotally supported on said first mentioned arm, and provided with a side flange, and connected with the lay, from which motion is communicated to said rocking locking arm, and said lay of the back roll and rod, and a clamping device connected therewith, said clamping device provided with a projecting surface adapted to extend over the side flanges on the swinging arm, and on the locking arm, and also provided with clamping surfaces adapted to engage a projection on said first mentioned arm, to hold the back rod in its upright position, and also adapted to be disengaged from said projection to allow the back rod to be moved inward to slacken the warp, and said projection, substantially as set forth.

2. In a loom, the combination with a vertical moving spring actuated rod, loosely mounted at its lower end in a supporting stand, and pivotally connected at its upper end with an arm loosely mounted on the back roll, and said arm, and a swinging arm pivotally supported at its lower end on said arm, and provided with a lip or side flange at its upper end, and moved by a rocking locking arm, and said rocking locking arm, also pivotally supported on said first mentioned arm, and provided with a side extension or lip, and connections from said rocking locking arm to the lay, from which motion is communicated to said arm, and said lay of a rocking back roll and rod, and a clamping device secured at one end to said back roll, and provided at its other end with a stationary clamping surface or jaw, and a spring actuated movable jaw, to engage a projection on the arm connecting the spring-actuated rod with the back roll, to hold the back rod in its upright position, and to be disengaged from said projection to release the back rod to slacken the warp, and said projection, and said clamping device also provided with a projecting surface, adapted to extend over the side flanges, on the swinging arm and the rocking locking arm, for the purpose stated, substantially as set forth.

GEORGE F. HUTCHINS.

Witnesses:

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