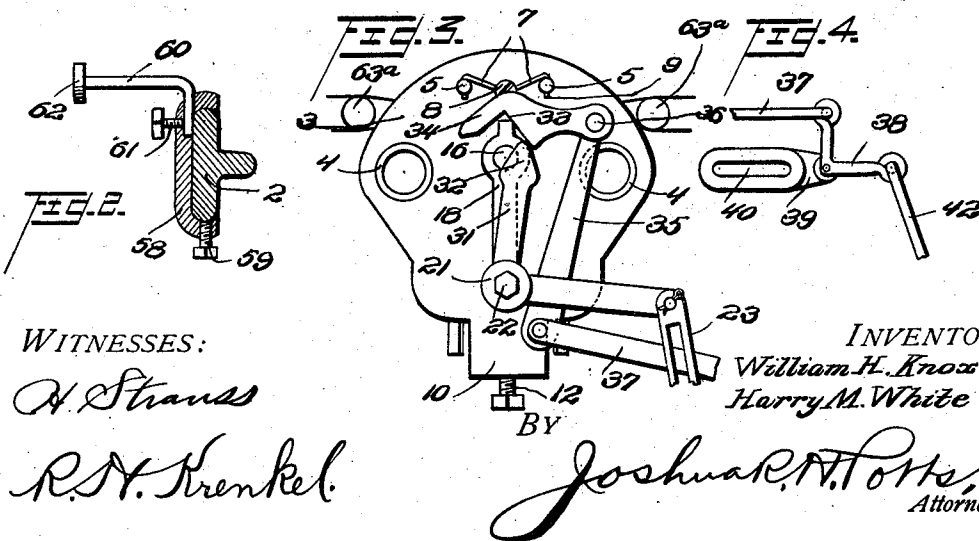
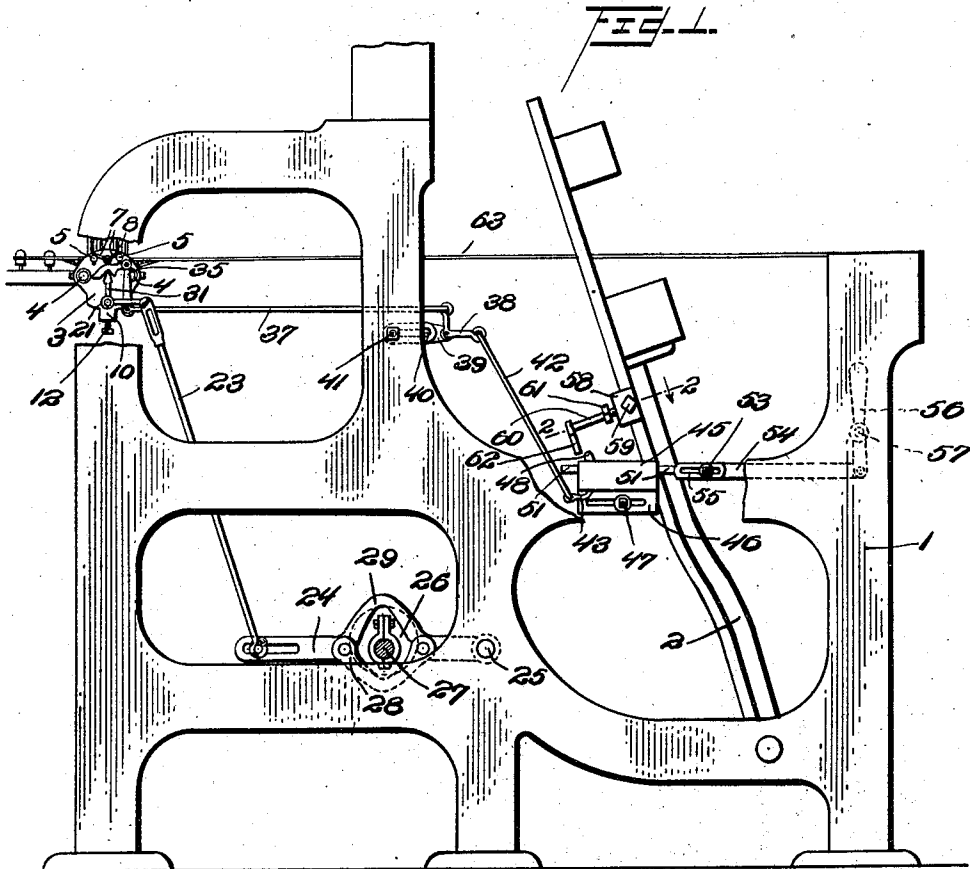


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 WARP STOP MOTION FOR LOOMS.  
 APPLICATION FILED SEPT. 8, 1911.

1,014,399.

Patented Jan. 9, 1912.

3 SHEETS—SHEET 1.



WITNESSES:

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*R. H. Krenkel*

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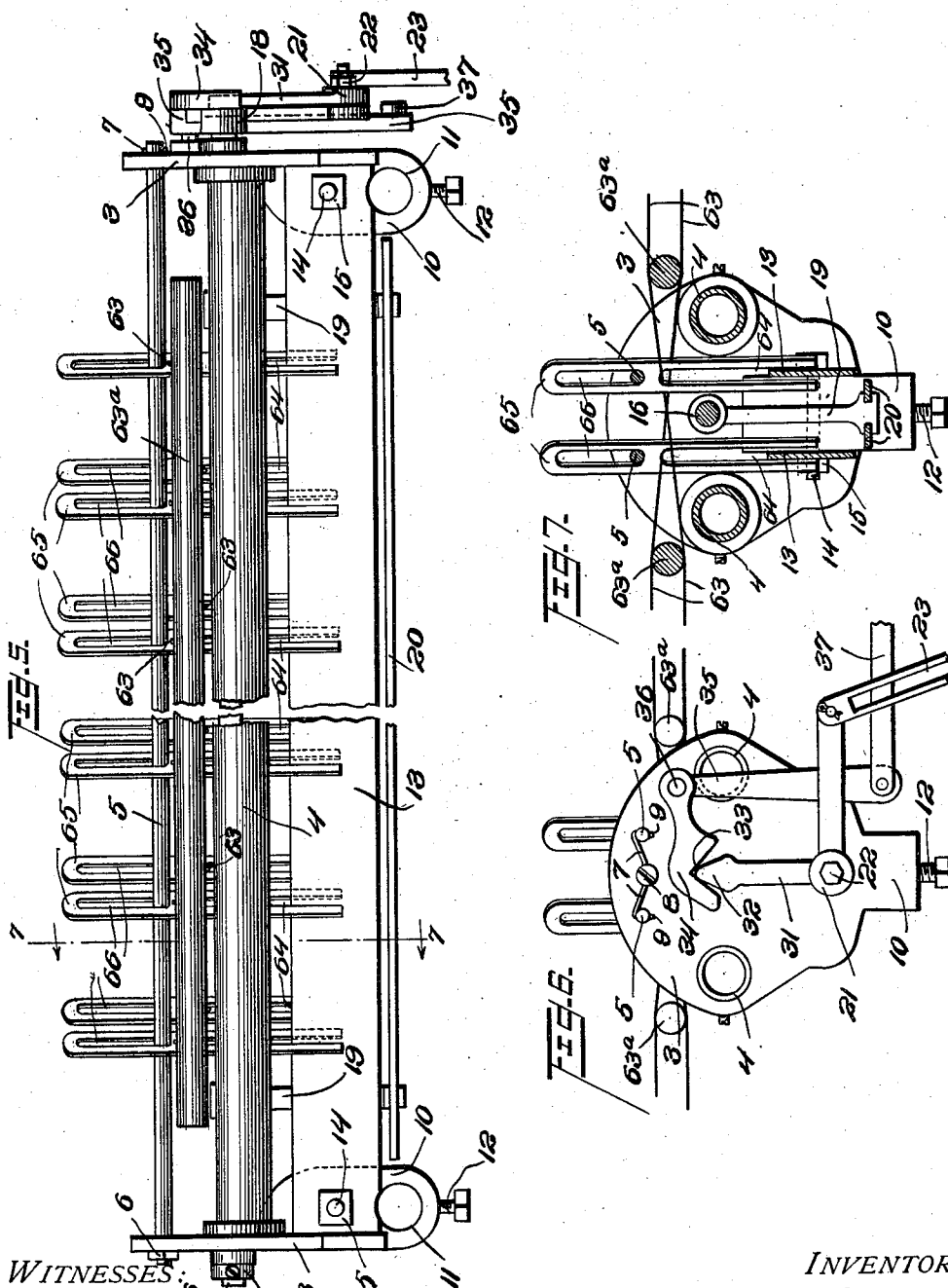
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3 SHEETS-SHEET 2.



WITNESSES:  
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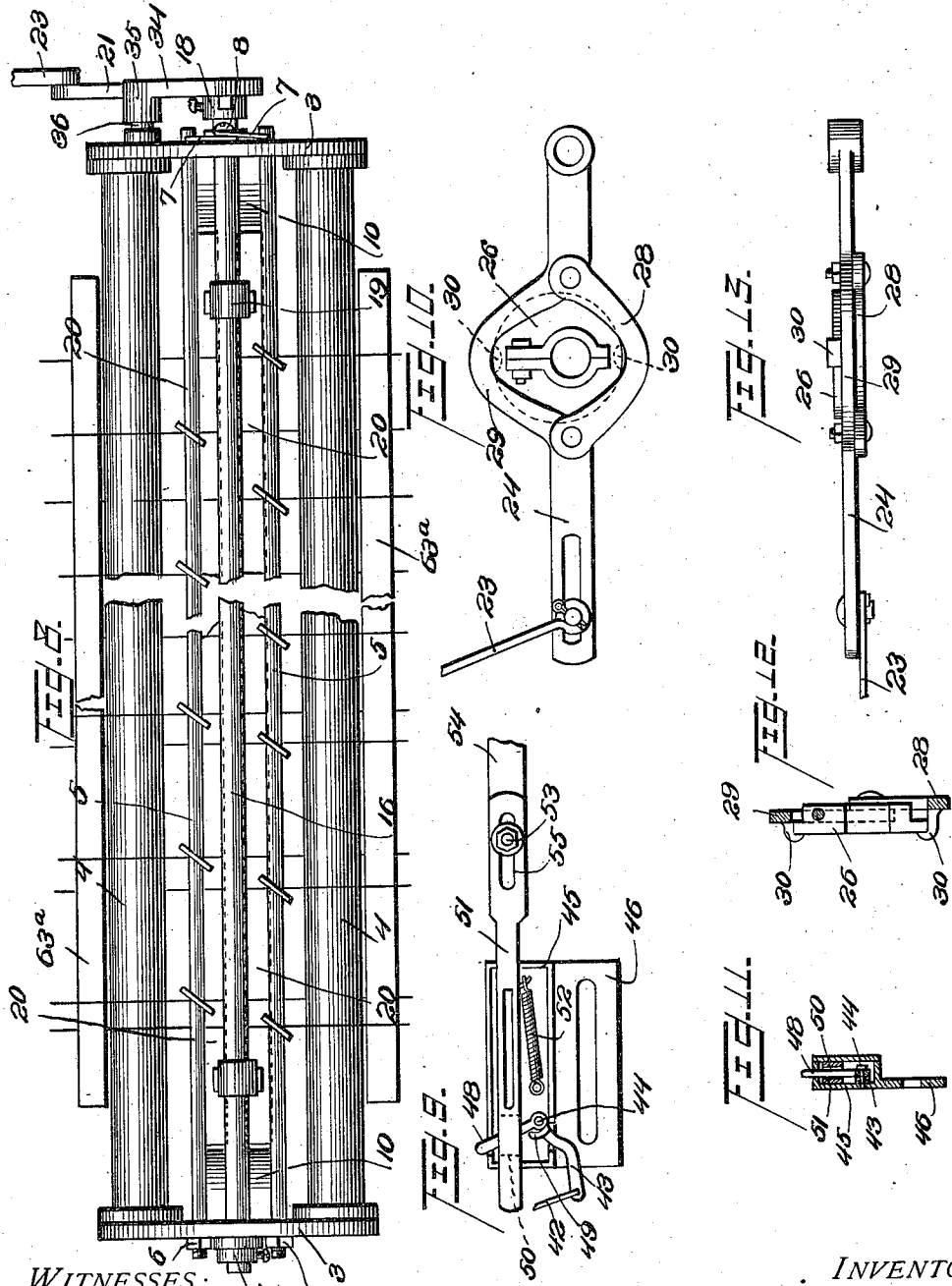
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3 SHEETS-SHEET 3.



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# UNITED STATES PATENT OFFICE.

WILLIAM H. KNOX AND HARRY M. WHITE, OF PHILADELPHIA, PENNSYLVANIA.

WARP STOP-MOTION FOR LOOMS.

1,014,399.

Specification of Letters Patent.

Patented Jan. 9, 1912.

Application filed September 8, 1911. Serial No. 648,343.

*To all whom it may concern:*

Be it known that we, WILLIAM H. KNOX and HARRY M. WHITE, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Warp Stop-Motions for Looms, of which the following is a specification.

Our invention relates to improvements in warp stop motions for looms, the object of the invention being to provide an attachment of this character which may be placed in position on any ordinary loom, and which will stop the loom in the event one of the warp threads should break.

A further object is to provide improvements of this character which are of extreme simplicity, which quickly respond to the fall of a detector brought about by the breaking of a warp thread, said detector serving to prevent the movement of one part, and thereby compelling the operation of another part to stop the loom.

With these and other objects in view, the invention consists in certain novel features of construction and combinations and arrangements of parts, as will be more fully hereinafter described and pointed out in the claims.

In the accompanying drawings: Figure 1, is a broken view in side elevation. Fig. 2, is an enlarged view in section on the line 2—2 of Fig. 1. Fig. 3, is an enlarged end elevation of the detector controlling mechanism showing the same in its position for stopping the loom. Fig. 4, is a detail view of the bell-crank-lever 38, and its support. Fig. 5, is a broken front elevation of the detector mounting. Fig. 6, is a view similar to Fig. 3 showing the parts in normal position. Fig. 7, is a view in section on the line 7—7 of Fig. 5. Fig. 8, is a broken plan view of Fig. 5. Figs. 9, 10, 11, 12, and 13, are views of various details of construction.

1, represents the frame of an ordinary loom having the ordinary pivoted lay 2. We would have it understood that only such parts of the loom are illustrated as are necessary to disclose our invention. Between the side member of frame 1 at its upper

rear portion, our improved transverse frame 3 is secured. This frame 3 constitutes end plates which are connected by relatively large tubular rods 4 and relatively small rods 5. Rods 5 extend through the end plates 3, are screw-threaded in one end for the reception of nuts 6, and at their other ends are held by a spring wire 7. This spring wire 7 is coiled between its ends around a screw 8, screwed into an end plate 3, and the ends of the wire are bent forming lugs 9, which are projected through openings in the rods 5, and blocks 10 are made integral with the plates 3 at their inner faces, and these blocks have openings 11 which are adapted to receive the rods of the loom (not shown) and said parts are clamped in position by means of set screws 12.

To the opposite sides of blocks 11, parallel plates 13 are secured by bolts 14, and nuts 15, and these plates 13 are located below rods 5. A shaft 16 extends centrally and longitudinally of the frame, and has rotary mounting in the end plates 3, and extends at both ends beyond the end plates as shown. A collar 17 is secured on the shaft at one end, and a depending crank arm 18 is secured on the shaft at its other end. Hangers 19 are secured to the shaft 16, and at their lower ends support parallel strips 20, so that the hangers 19 and the strips 20 constitute an oscillating frame as will hereinafter appear. The lower end of crank arm 18 constitutes a bearing to which a bell-crank-lever 21 is fulcrumed by means of a bolt 22. The horizontal member of this lever is connected by a rod 23 with the free end of a pivoted link 24. Link 24 is pivotally connected by a pin 25 to the frame 1, and is oscillated by means of a cam 26 on a shaft 27. Link 24 is preferably of the peculiar shape shown having a removable member 28, and this member 28, together with the bowed portion of said link, are provided with lips which overhang the cam 26.

The vertical member 31 of the bell-crank-lever 21 is made with an arrow shaped head 32 which projects into a recess 33 in a horizontal member 34 of a bell-crank-lever 35. This lever 35 is fulcrumed on a pin

36 secured in an end plate 3, and its vertical or depending member is connected by a rod 37 with one member of a bell-crank lever 38. This bell-crank-lever is fulcrumed in one end of a plate 39, and the latter is provided with a slot 40 for the reception of a bolt 41, extending through frame 1, so as to permit the bell-crank-lever 38 to be adjusted to the position desired. The other member of bell-crank-lever 38 is connected by a rod 42 with a pivoted arm 43. Arm 43 is supported upon a pin 44 in a housing 45. This housing 45 is made integral with a slotted plate 46, and the latter is secured by a bolt 47 to frame 1, said bolt projecting through the slot and permitting adjustment of the parts. A finger 48 is also pivotally supported on pin 44, and a lug 49 on the arm 43 bears against said finger 48 so that when the arm 43 is moved upwardly, the free end of the finger 48 will be moved upwardly and forwardly. The finger 48 projects through a slot 50 in a bar 51. This bar 51 is mounted to slide through the box 45, and is held in its normal position by means of a spring 52. Bar 51 is adjustably connected by a bolt 53 with a bar 54, said bars having slots 55 therein for the reception of said bolt 53. The free end of bar 54 is connected to the lower end of a hand lever 56, which is adapted to turn the shaft 57 to start and stop the loom.

To one of the upright members of the lay 2, a bracket 58 is secured by a set screw 59, and has a crank arm 60 adjustably secured thereto by means of a set screw 61. On the crank arm 60, a finger 62 is secured, and is adapted to move through a normal arc out of engagement with finger 48, but when said finger 48 is thrown upwardly, this finger 62 will engage the finger 48, and move said finger 48 and bars 51 and 54 so as to turn the shaft 57 and stop the loom.

63 represent the warp threads which are passed over rods 63<sup>a</sup>, and through the lower slots 64 in detectors 65, said detectors having upper slots 66 to receive the rods 5, and the lower slots 64 enable the detectors to straddle the plates 13, and are normally held elevated so as to permit the strip 20 to move backwardly and forwardly. In other words, the normal operation due to the cam 26, and through the medium of link 24, and rod 23, is to turn the shaft 16, arm 18 oscillating freely.

When one of the warp threads break, its detector will fall, and prevent the oscillation of the hangers 19, because the lower end of said detector will be in the path of movement of one of the strips 20. As soon as this happens, arm 18 cannot oscillate and the continued movement which is imparted to the rod 23 will cause the bell-crank-lever 21 to move on its fulcrum. This movement of the lever 21 will cause the arrow head 32 to

engage one of the walls of the groove 33 in the member 34 of lever 35. Hence this lever 35 will be swung as shown in Fig. 3, and will cause the movement of the finger 48 so that the lay 2 will compel the rods 51 and 54 to turn shaft 57 and stop the loom.

Various slight changes might be made in the general form and arrangement of parts described without departing from our invention, and hence we do not limit ourselves to the precise details set forth, but consider ourselves at liberty to make such changes and alterations as fairly fall within the spirit and scope of the appended claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. An attachment for looms comprising a support, an oscillating frame mounted in the support, a crank arm secured to and adapted to oscillate said frame, detectors supported on the warp threads and adapted when one falls to stop the oscillation of said frame, a bell-crank-lever fulcrumed on said arm, means for moving said bell-crank-lever to move the arm and the frame, a lever having a recess therein into which one end of said bell-crank-lever projects, whereby said last-mentioned lever is moved when the bell-crank-lever is moved and the frame held against movement, and means for stopping the loom connected with said last-mentioned lever, substantially as described.

2. In a loom, the combination with a frame, and means for stopping the loom, of detectors supported upon and normally elevated by the warp threads, an oscillating frame below the warp threads, an arm secured to and adapted to oscillate the frame, the movement of said frame stopped by the fall of one of said detectors, a lever fulcrumed on said arm, a second lever having a recess into which one end of the first-mentioned lever projects, means for moving the first-mentioned lever to oscillate the frame, and means connecting said recessed lever with the loom stopping means whereby the movement of the first-mentioned lever on its fulcrum causes the operation of the loom stopping means, substantially as described.

3. An attachment for looms, comprising end plates, rods connecting the end plates and adapted to support the warp threads, an oscillating frame supported by the end plates, detectors supported on the warp threads, and normally elevated out of the path of movement of the oscillating frame and adapted to stop said frame when said detectors fall, an arm secured to oscillate with said frame, a bell-crank-lever fulcrumed on the free end of said arm, means connected to said lever for oscillating said arm, loom stopping means operated by the movement of the lever when the arm is held against oscillating movement by one of the

detectors, a pivoted lay, a finger on the pivoted lay, a spring-pressed loom stopping bar, a pivoted finger projecting through a slot in said bar and normally out of the path of movement of said first-mentioned finger, devices connecting said last-mentioned finger with said last-mentioned bell-crank-lever, whereby the movement of the latter causes said last-mentioned finger to move into the path of movement of the finger on the lay, and permit the latter to move the lay stopping bar, substantially as described.

4. An attachment for looms, comprising end plates, rods connecting the end plates and adapted to support the warp threads, a shaft supported in said end plates, an oscillating frame depending from and secured to said shaft, detectors supported on the warp and normally elevated out of the path of movement of the oscillating frame and adapted to stop said frame when said detectors fall, a depending crank arm secured to said shaft, a bell-crank-lever fulcrumed on the free end of said arm, means for moving said lever to swing the frame, a recessed lever pivoted on one plate and normally receiving the free end of said bell-crank-lever, said recessed lever constructed to stop the loom when moved and adapted to be moved by the bell-crank-lever when the frame is stopped by a detector, substantially as described.

5. In a loom, the combination with a frame, a starting and stopping lever, and a pivoted lay, of detectors supported upon and normally elevated by the warp threads, a shaft, a frame secured to said shaft, a crank arm on said shaft, means for oscillating said crank arm to oscillate the frame, the movement of said frame stopped by the fall of one of said detectors, a bell-crank-lever fulcrumed on the free end of said arm, a second bell-crank-lever having a recess into which one end of the first-mentioned bell-crank-lever projects, an oscillating link, a rod connecting one member of the first-mentioned bell-crank-lever with said oscillating link, and loom stopping means operated by the last-mentioned bell-crank-lever when moved by the first-mentioned bell-crank-lever, substantially as described.

6. In a loom, the combination with a frame, a starting and stopping lever, and a pivoted lay, of detectors supported upon and normally elevated by the warp threads, a shaft, a frame secured to said shaft, a crank arm on said shaft, means for oscillating said crank arm to oscillate the frame, the movement of said frame stopped by the fall of one of said detectors, a bell-crank-lever fulcrumed on the free end of said arm, a second bell-crank-lever having a recess into which one end of the first-mentioned bell-crank-lever projects, an oscillating link,

a rod connecting one member of the first-mentioned bell-crank-lever with said oscillating link, and loom stopping means connected with said last-mentioned bell-crank-lever whereby when the oscillation of the arm is prevented by the fall of a detector, said last-mentioned bell-crank-lever will be moved on its fulcrum by the action of the first-mentioned bell-crank-lever in the recess of the second bell-crank-lever, substantially as described.

7. In a loom, the combination with a frame, a starting and stopping lever, and a pivoted lay, of detectors supported upon and normally elevated by the warp threads, a shaft, a frame secured to said shaft, a crank arm on said shaft, means for oscillating said crank arm to oscillate the frame, the movement of said frame stopped by the fall of one of said detectors, a bell-crank-lever fulcrumed on the free end of said arm, a second bell-crank-lever having a recess into which one end of the first-mentioned bell-crank-lever projects, an oscillating link, a rod connecting one member of the first-mentioned bell-crank-lever with said oscillating link, loom stopping means operated by the last-mentioned bell-crank-lever when moved by the first-mentioned bell-crank-lever, a pivoted lay, a loom stopping bar, a finger projecting through said bar, devices connecting said finger with said last-mentioned bell-crank-lever, whereby the movement of said lever causes said finger to move upwardly, a pivoted lay, and a finger on said lay adapted to engage said first-mentioned finger when the latter is elevated to move the loom stopping bar, substantially as described.

8. In a loom, the combination with a frame, a starting and stopping lever, and a pivoted lay, of detectors supported upon and normally elevated by the warp threads, a shaft, a frame secured to said shaft, a crank arm on said shaft, means for oscillating said crank arm to oscillate the frame, the movement of said frame stopped by the fall of one of said detectors, a bell-crank-lever fulcrumed on the free end of said arm, a second bell-crank-lever having a recess into which one end of the first-mentioned bell-crank-lever projects, an oscillating link, a rod connecting one member of the first-mentioned bell-crank-lever with said oscillating link, and loom stopping means connected with said last-mentioned bell-crank-lever whereby when the oscillation of the arm is prevented by the fall of a detector, said last-mentioned bell-crank-lever will be moved on its fulcrum by the action of the first-mentioned bell-crank-lever in the recess of the second bell-crank-lever, a pivoted lay, a loom stopping bar, a fulcrum projecting through said bar, devices connecting said finger with said last-mentioned

bell-crank-lever, whereby the movement of said lever causes said fulcrum to move upwardly, a pivoted lay, and a fulcrum on said lay adapted to engage said first-mentioned fulcrum when the latter is elevated to move the loom stopping bar, substantially as described.

In testimony whereof we have signed our

names to this specification in the presence of two subscribing witnesses.

WILLIAM H. KNOX.  
HARRY M. WHITE.

Witnesses:

CHARLES E. POTTS,  
R. H. KRENKEL.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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