Oct. 6, 1931. A. A. GORDON 1,826,310

KNOCK-OFF FOR ELECTRIC WARP STOP MOTION

Filed Sept. 5, 1929

Fig. 1.

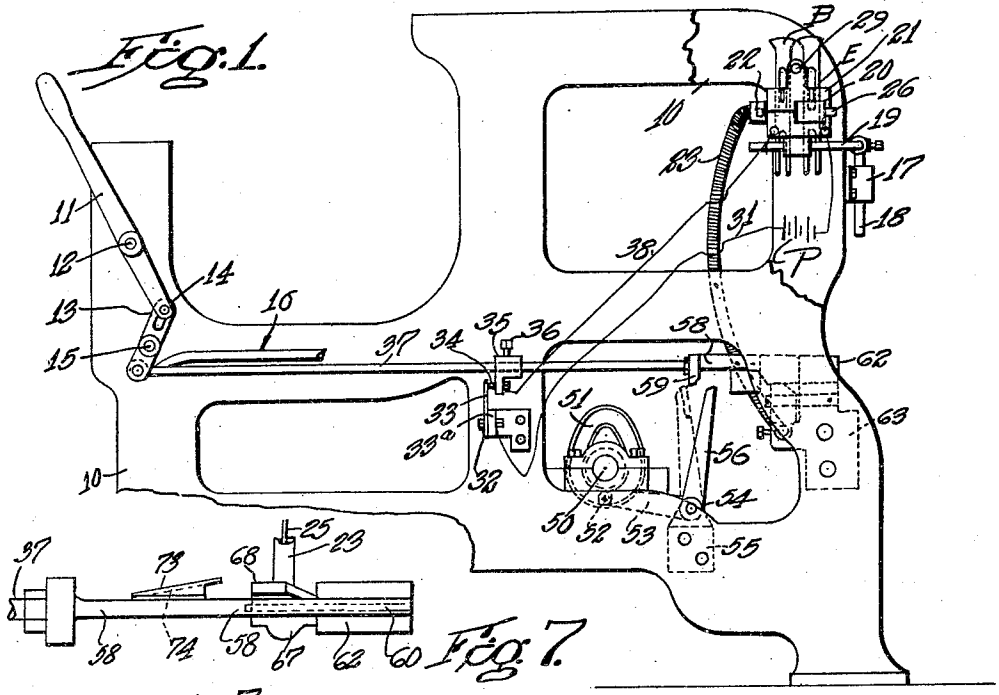


Fig. 7.

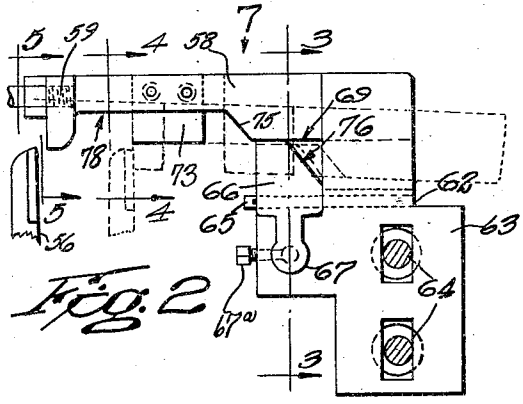


Fig. 2.

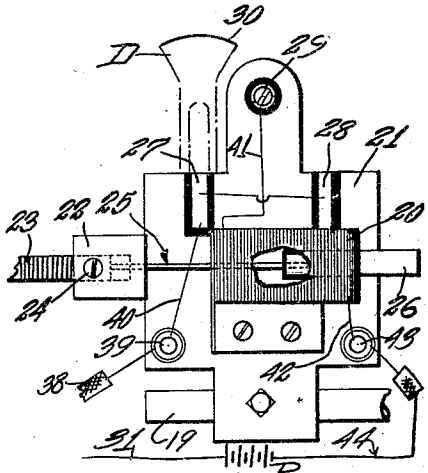


Fig. 6.

Fig. 3.

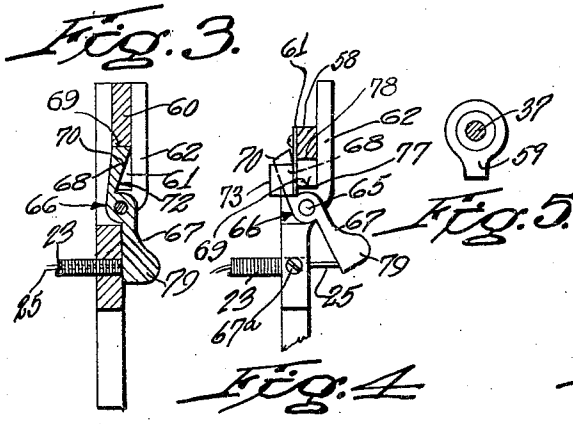


Fig. 5.

Fig. 4.

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UNITED STATES PATENT OFFICE

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KNOCK-OFF FOR ELECTRIC WARP STOP MOTION

Application filed September 5, 1929. Serial No. 390,620.

This invention relates to improvements in warp stop motions and particularly to the knocking-off mechanism therefor, and it is the general object of the invention to provide a simple and durable mechanism of this type which shall act to reset itself upon the completion of the knocking-off stroke.

It is a further object of my present invention to provide a latch supported longitudinally movable member which shall normally be out of the path of a regularly moving actuator, but which when in the path of the latter will be moved to stop the loom and also rock the latch back to normal position through the operation of a cam face movable at the time of knock-off.

With these and other objects in view which will appear as the description proceeds, my invention resides in the combination and arrangement of parts hereinafter described and set forth in the claims.

In the accompanying drawings, wherein a convenient embodiment of my invention is set forth,

Fig. 1 is a side elevation of a loom having my invention applied thereto, certain parts being removed for the sake of clearness.

Fig. 2 is a side elevation on an enlarged scale of the knock-off mechanism shown in Fig. 1.

Figs. 3, 4 and 5 are vertical sections on lines 3—3, 4—4 and 5—5, respectively, of Fig. 2, the parts in Fig. 4 being shown in knock-off position,

Fig. 6 is an enlarged elevation of certain parts of the motion shown in the upper part of Fig. 1, and

Fig. 7 is a top plan view taken in the direction of arrow 7, Fig. 2, certain parts being in a different position.

Referring to Fig. 1, I have shown a loom frame 10 and a shipper handle 11 pivotally mounted thereon at 12. A knock-off lever 13 is operatively connected to the shipper lever by means of stud 14 and is pivoted to the frame at 15. The lower end of the lever 13 is connected to a rearwardly extending rod 16 which operates through mechanism not shown to stop the loom when moved rearwardly.

The rear part of the loom frame is provided with a stand 17 on which is mounted an upright bar 18 having adjustably secured thereto a rod 19. Extending across the loom is an electrical warp stop motion designated herein generally at E, said mechanism being adjusted along the rod 19 and having as a part thereof a solenoid 20 which is supported to an end plate 21. One side only of the motion is shown herein, but it is to be undestood that each side of the loom has a bar 18 and rod 19.

A guide hub 22 formed on the end plate 21 receives the upper end of a coiled wire 23 held in position in said hub by means of set screw 24. A small wire 25 formed of rigid material, and non-magnetic if so desired, extends through the coiled wire and is rigidly attached to the left hand end of a core 26 of the solenoid, as shown in Fig. 6.

A pair of contact bars 27 and 28 are insulated from the end plate 21 and guide a plurality of drop wires D. A contact rod 29 is located above and intermediate the bars 27 and 28 and is positioned for engagement with the heads 30 of the drop wires.

In the operation of the mechanism thus far described the parts will remain stationary until a fault in the warp occurs, at which time the drop wire corresponding to the defective warp will be lowered until the head thereof engages the rod 29. This drop wire will be in engagement with one or another of the guide bars 27 and 28, so that current will flow through the following circuit: battery P, wire 31, binding post 32 on fixed stand 33*a* of insulating material, spring 33, contact screw 34 on insulated carrier 35 held by screw 36 to knock-off rod 37, from screw 34 to wire 38, binding post 39 insulated from the end plate, wire 40 to one or another of the bars 27 and 28, through the drop wire, rod 29, wire 41, solenoid 20, wire 42, binding post 43, also insulated from the end plate, and wire 44 back to the battery P. Current flowing in this circuit will energize the solenoid so that the latter will move the core 26 to the left from the position shown in Fig. 6. Inas-

much as the push wire 25 is connected to the core 26, said wire will also be moved to the left.

The matter thus far described of itself forms no part of my present invention. The relation of the solenoid and the head or end plate 21 is made the subject matter of a separate application Ser. No. 397,408.

My invention relates more particularly to the knock-off which is illustrated particularly in Figs. 2, 3, 4 and 5. The bottom shaft 50 has secured thereto a track cam 51 which receives a cam roll 52 mounted on the substantially horizontal arm 53 of a lever 54. The latter is mounted on a small stand 55 secured to the loom frame and has a vertically extending actuator arm 56. During the normal operation of the loom the arm 56 will move back and forth between the full and dotted line positions, the time of the rearward movement, which is that part of the stroke which effects knock-off, being determined by the angular position of the cam with respect to the shaft.

Pivoted to the lower end of the lever 13 and extending rearwardly therefrom is the previously mentioned knock-off rod 37 to the rear end of which is adjustably connected longitudinally thereof a head 58. The latter has a depending shoulder 59 which is adapted for engagement with the actuator arm 56 at the time of warp fault. The right hand end of the head as viewed in Fig. 2 is rectangular in cross section as shown in Fig. 3 at 60 and extends through a slot 61 formed in an upstanding arm 62 on support 63. The latter is held to the loomside by means of bolts 64 and has secured therein a horizontally extending pin 65 on which is mounted pivotally a latch 66. The latter has a depending finger 67 which lies in the path of the lower end of the wire 25. The coiled wire 23 is secured in the support 63 by means of a set screw 67*a*.

The upper part of the latch is formed as a supporting arm 68 on which normally rests the lower surface 69 of the head 58. If desired I may form the upper face of the arm 68 with an incline 70 which extends downwardly and to the left as viewed in Figs. 3 and 4. The coacting surface 69 may be similarly inclined so that the weight of the head 58 will act to hold the finger 67 normally against the support 63 in the position shown in Fig. 3.

By referring to Fig. 3, it will be seen that the arm 68 is substantially in alignment with the slot 61 and lies under the rectangular portion 60 of the head 58 and that the arm is undercut as at 72 to make room for portion 60 when it falls.

In the operation of the mechanism the arm 56 will move without engagement of the shoulder 59 so long as the latch 66 is in the position shown in Fig. 3. When the solenoid is energized, as heretofore described, the wire 25 will receive an endwise motion in a direction to move the finger 67 from the position shown in Fig. 3 to that shown in Fig. 4, thereby removing the arm 68 from under the head 58 and permitting the latter to fall. On the next movemnt of the actuator arm 56 from the dotted to the full line position shown in Fig. 1 the head and rod 37 will be moved to the right from the position shown in Fig. 1, thereby rocking the lever 13 and shipper handle 11 and moving the rod 16 to effect stoppage of the loom. During the knocking off operation it will be understood that the head 58 moves to the right from the full to the dotted line position shown in Fig. 2.

In order to effect resetting of the mechanism I secure to one of the vertical faces of the portion 60 a cam plate 73 having a surface 74 inclined with respect to the plane of movement of the head and positioned to engage the arm 68. As the head 58 moves to the right as viewed in Figs. 2 and 7 in lowered position the cam face 74 engages arm 68 and moves it from the abnormal position shown in Fig. 4 to normal position as shown in Fig. 3. The part 60 is held in slot 61 against lateral movement and therefore enables the cam 73 to accomplish the desired result. This action takes place while the head is in the dotted line position shown in Fig. 2. The parts will remain in this position while the loom is stopped because of the fact that the shipper handle will be in knock-off position and movement of rod 37 pulls screw 34 away from spring 33, thereby breaking the circuit and deenergizing the solenoid, thus permitting reverse movement of wire 25 by cam 74 acting through the latch. After the fault in the warp has been corrected the weaver will pull the shipper handle forwardly or to the left as viewed in Fig. 1, the effect of which will be to move the head forwardly. An upwardly and forwardly inclined surface 75 on the under side of the head will engage a correspondingly inclined surface 76 on the latch, so that movement to the left on the part of the head as viewed in Fig. 2 will cause the same to rise upwardly to the full line position. In this way the parts are restored to their normal position.

It is to be understood that the bottom 77 of the slot on which the surface 69 slides is so placed that the latch can move pivotally under the bottom surface 78 of the head 58. In order to keep the latch in the normal position shown in Fig. 3 after it has been moved thereby the cam clip or plate 73 the finger 67 is counterweighted as at 79.

From the foregoing it will be seen that I have provided a knock-off rod having a head normally held in raised position by a latch which is movable to head relieving position, whereupon the latter will fall into the path of the actuator. It will also be seen that during the completion of the knocking-off stroke the latch is automatically restored to position, and that when the pull rod 37 is moved

to running position the head is elevated to normal position.

Having thus described my invention it will be seen that changes and modifications may be made therein by those skilled in the art without departing from the spirit and scope of the invention and I do not wish to be limited to the details herein disclosed, but what I claim is:

1. In a warp stop motion for a loom having a rod to be moved longitudinally to effect loom stoppage, a regularly moving actuator, a head on the rod, a pivoted latch located under the rod and engaging the head to support the same, means upon occurrence of warp fault to rock the latch out of supporting position with respect to the head, the head thereupon falling into engaging position with the actuator to be moved by the latter to stop the loom, means operative during the stopping of the loom to restore the latch to normal position, and coacting inclined faces formed on the head and latch, whereby movement of the rod to running position will effect raising of the head to normal position where it is supported by the latch.

2. In a warp stop motion for a loom having a rod to be moved longitudinally to effect loom stoppage, a regularly moving actuator, a head formed on the rod, a latch normally supporting the head out of the path of movement of the actuator, means operative upon warp fault to move the latch out of supporting position with respect to the head, whereupon the latter will fall into the path of the actuator to be engaged by the latter to effect longitudinal movement of the rod, and resetting means movable with the head to engage the latch and restore the latter to normal position during the completion of the knock-off movement of the rod, the resetting means comprising a cam face carried by the head to engage the latch to move the latter toward normal position during the completion of the knock-off stroke of the rod.

3. In a warp stop motion for a loom having a rod to be moved longitudinally to effect loom stoppage, a regularly moving actuator, a head member formed on and moving with the rod, a latch member normally having supporting relation with respect to the head, means to move the latch member out of supporting relation with respect to the head member upon occurrence of warp fault, and cam means carried by one member and engaged by the other during the latter part of the movement of the head under influence of the actuator to restore the latch member to normal position.

4. In a warp stop motion for a loom having a rod to be moved longitudinally to effect loom stoppage, a regularly moving actuator, a head formed on the rod, a latch normally supporting the head out of the path of movement of the actuator, and means operative upon warp fault to move the latch out of supporting position with respect to the head, whereupon the latter will fall into the path of the actuator to be engaged by the latter to effect longitudinal movement of the rod, the latch and head having upper and lower inclined surfaces, respectively, the weight of the head coacting with the inclined surfaces to hold the latch in normal position.

5. In a warp stop motion for a loom having a head movable in one direction to effect loom stoppage and movable in the opposite direction to cause loom running, a regularly moving actuator, a pivoted latch holding the head normally in raised position, means operative upon occurrence of warp fault to move the latch out of supporting relation with respect to the head, whereupon the latter falls into the path of the actuator to be moved by the latter to effect loom stoppage, a stop to limit downward movement of the head when the latter is unsupported by the latch, cam means effective during the last part of the movement of the head when moving in loom stopping direction to restore the latch to normal position, moving said latch under a portion of the head, and coacting means formed on the head and latch effective when the head moves in a direction to cause running of the loom to lift the head away from the stop and restore the same to normal position.

6. In a warp stop motion for a loom having a head movable in one direction to effect loom stoppage and movable in the opposite direction to cause loom running, a regularly moving actuator, a guide for the head limiting lateral movement thereof, said head being movable vertically in the guide, a latch pivotally mounted to move in a plane transverse of the direction in which the head moves to effect loom stoppage, the latch normally supporting the head in raised position, and means to rock the latch out of supporting position with respect to the head, whereby the latter will fall in the guide and into the path of the actuator to be moved by the latter in a loom stopping direction.

7. In a warp stop motion for a loom having a head movable in one direction to effect loom stoppage and movable in the opposite direction to cause loom running, a regularly moving actuator, a guide for the head limiting lateral movement thereof, said head being movable vertically in the guide, a latch pivotally mounted to move in a plane transverse of the direction in which the head moves to effect loom stoppage, the latch normally supporting the head in raised position, means to rock the latch out of supporting position with respect to the head, whereby the latter will fall in the guide and into the path of the actuator to be moved by the latter in a loom stopping direction, and means effective during the completion of the loom stopping

movement of the head to move the latch in a direction transverse of the direction in which the head is moving to restore said latch to normal position.

8. In a warp stop motion for a loom having a head movable in one direction to effect loom stoppage and movable in the opposite direction to cause loom running, a regularly moving actuator, a guide for the head limiting lateral movement thereof, said head being movable vertically in the guide, a latch pivotally mounted to move in a plane transverse of the direction in which the head moves to effect loom stoppage, the latch normally supporting the head in raised position, means to rock the latch out of supporting position with respect the head, whereby the latter will fall in the guide and into the path of the actuator to be moved by the latter in a loom stopping direction, means effective during the completion of the loom stopping movement of the head to move the latch in a direction transverse of the direction in which the head is moving to restore said latch to normal position, and additional means operative upon movement of the head in a direction to cause running of the loom to lift said head out of engaging position with respect to the actuator.

9. In a warp stop motion for a loom having a head movable in one direction to effect loom stoppage and movable in the opposite direction to cause loom running, a regularly moving actuator, a guide for the head limiting lateral movement thereof, said head being movable vertically in the guide, a latch pivotally mounted to move in a plane transverse of the direction in which the head moves to effect loom stoppage, the latch normally supporting the head in raised position, means to rock the latch out of supporting position with respect to the head, whereby the latter will fall in the guide and into the path of the actuator to be moved by the latter in a loom stopping direction, means effective during the completion of the loom stopping movement of the head to move the latch in a direction transverse of the direction in which the head is moving to restore said latch to normal position, and additional means operative upon movement of the head in a direction to cause running of the loom to lift said head out of engaging position with respect to the actuator, said last named additional means comprising coacting inclined surfaces on the head and latch.

In testimony whereof I have hereunto affixed my signature.

ALBERT A. GORDON.