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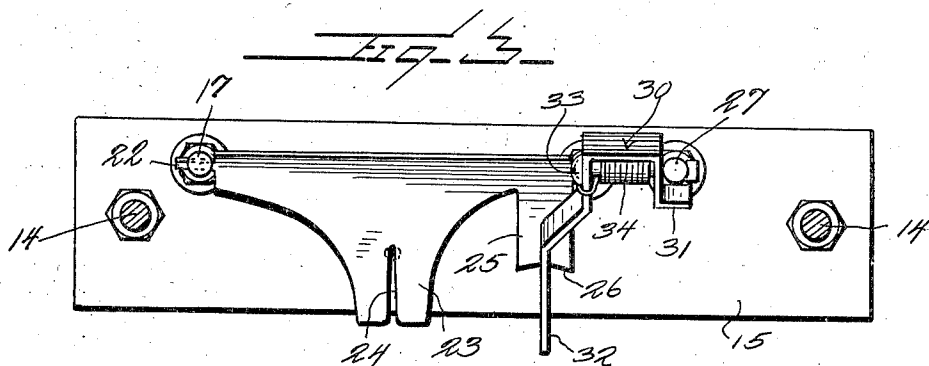
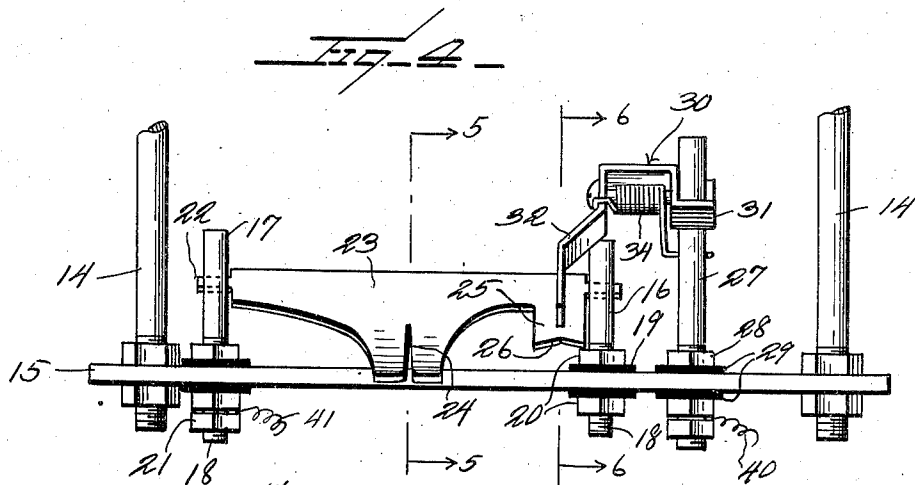
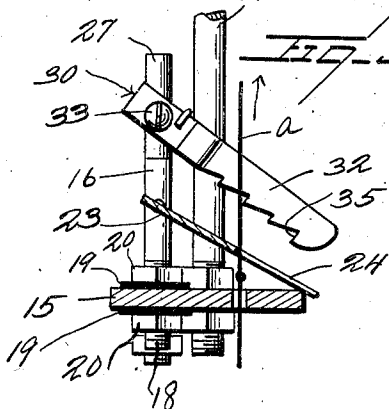
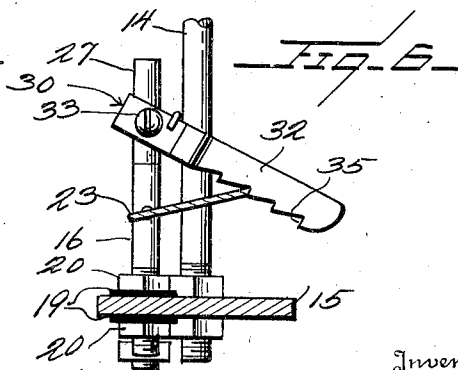
M. H. ROSENFELD

2,126,348

KNOT ACTUATED STOP MOTION

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2 Sheets-Sheet 2



Inventor

M. H. Rosenfeld

By *Watson E. Coleman*

Attorney

## UNITED STATES PATENT OFFICE

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## KNOT ACTUATED STOP MOTION

Mitchell H. Rosenfeld, Cleveland Heights, Ohio

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3 Claims. (Cl. 28—64)

This invention relates to stop motions for knitting machines, looms and like mechanisms and particularly to devices which are engaged by a knot in a traveling thread, which devices initiate the operation of any usual or suitable stop motion.

The general object of my invention is to provide a very simple and readily actuated stop motion of this character and particularly to provide a construction which, while adapted to the initial actuation of mechanical stop motions, is particularly adapted to initiate the actuation of an electrical stop motion.

Another object is to provide a device of this character which may be quickly and readily reset after the machine has been stopped by a knot engaging my mechanism, and a further object is to provide a device of this character which may be readily applied, which is extremely simple, which will not readily get out of order and which can be easily adjusted at any time.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings wherein:

Fig. 1 is a front elevation of a bobbin support and my knot actuated circuit closing mechanism applied in connection therewith.

Fig. 2 is a diagrammatic view showing my stop motion actuated mechanism in side elevation and showing an electrical circuit diagrammatically.

Fig. 3 is a top plan view of my mechanism, the supporting bolts being in section.

Fig. 4 is a front elevation of the structure shown in Fig. 3.

Fig. 5 is a section on the line 5—5 of Fig. 4, showing the parts in their normal position and before being actuated by a knot.

Fig. 6 is a section on the line 6—6 of Fig. 4, with the yarn guide lifted.

Referring to these drawings, it will be seen that I have illustrated in Fig. 1 a frame having a base 10, uprights 11, cross-bars 12 and thread guide and tensioning means generally indicated T. This is purely illustrative. Mounted upon this frame are the bobbins 13 from which thread or yarn is illustrated as being taken, the yarn moving in the direction of the arrow in Fig. 1. Suspended from the cross-bar 12 by means of the bolts 14 is a plate 15. Extending upward from this plate are the two posts 16 and 17, these posts being shown as screw-threaded at their lower ends, as at 18, and extending through the plate but being insulated therefrom by insulation 19 and carrying the nuts 20 which hold the posts in place upon the plate. The post 17 is shown as

being provided with a binding nut 21 whereby it may be connected to an electric wire. The posts 16 and 17 are provided with apertures for the laterally projecting trunnions 22 of a transversely extending plate 23. The plate 23 has, therefore, rocking engagement with the posts 16 and 17 and is free to oscillate in a vertical plane. This plate is forwardly extended at 23 at its middle and is provided with the inwardly extending very acute V-shaped slot 24. This slot is wide enough for the passage of the yarn or thread *a* shown in Fig. 1 and in Fig. 5. That end of the plate 23 adjacent the post 16 is provided with the outwardly projecting lug or arm 25, the edge face of which is slightly re-entrantly angled at 26. Supported upon a post 27 extending upwardly through the plate 15 and held thereon by the nuts 28 and insulated from the plate by the insulation 29 is a latch 30. One arm of this latch is angularly bent and then extended across the front of the post 27, as at 31. The other arm of the latch is bent parallel to the first named arm, then laterally extended away from the first named arm and then longitudinally extended at 32. The two arms of this latch are held in pivotal engagement upon the post 27 by means of the transverse pivot pin 33 so that the latch is free to oscillate. A spring 34 coiled around the pivot pin 33 has one end bearing against the rear face of the post 27 and the other end engaged with the arm 32. This spring urges this arms 32 downward with a light pressure. The latch is limited in its downward movement by reason of the portion 31 striking the post 27. The lower edge of the arm 32 is formed with ratchet teeth 35, as shown in Figs. 5 and 6, and these ratchet teeth are adapted to be engaged by the outer edge 26 of the lug 25. When the plate 23 is lifted from the position shown in Fig. 5 to the position shown in Fig. 6 by a knot in the thread *a*, the lug 25 will, of course, be lifted and will engage with the ratchet notches 35, and this will hold the plate raised until the latch is manually released.

While this mechanism may be used in connection with any mechanically operated stop motion, I have designed it for and illustrated it as used in connection with an electric stop motion. Inasmuch as electric stop motions are well known, I have not attempted to illustrate any details but have shown the stop motion as including an electromagnet 36 in Fig. 2 coacting with an armature 37 which normally closes a circuit through a motor 38. When the armature 37 is drawn towards the magnet 36, the circuit is broken and the motor stops. This is to be understood as be-

ing purely diagrammatic and that I am not in any way limited to the use of any particular form of electrically actuated stop motion or even to an electrically actuated stop motion. The magnet 36 is shown as being connected in circuit with a battery 39 and with the post 17 and the post 27. Normally, the knot actuated plate 23 is in lowered position, as shown in Fig. 5, and is, therefore, entirely separated from the arm 32. When, however, a knot in the thread *a* occurs, this knot, not being able to pass through the slot 24, will act to lift the plate 23 and the plate moves upward until the lug 25 strikes the under edge face of the arm 32 of the latch thereby closing the circuit from the post 17 through the latch to the post 27 and thus by wires 40 and 41 completing the circuit through the magnet and the battery or other source of current. This immediately stops the machine. It will be noted that the plate 23 can turn on its pivots to a position to permit the knot to pass upward through the V-shaped notch to a point above the plate and that, therefore, no strain is placed upon the thread or yarn which would tend to break it. The knot may then be eliminated by hand and then the plate 23 which has been held in its raised position by the latch, as shown in Fig. 6, can be manually lowered to its initial position and the machine started up again.

I have illustrated in Fig. 2 a spring 42 which will act to automatically retract the armature or switch 37 upon the breaking of the circuit through wires 40 and 41, this spring causing the armature to immediately close the circuit through the motor 38 to permit the immediate starting up of the machine.

It will be seen that as long as the yarn is uniform, it will pass through the slot 24 without hindrance but that as soon as a knot or any thickness of yarn appears, this thickened portion or knot will pull the plate 23 up, as before described, and stop the machine.

It will be also noted that there are no complicated parts which can get out of order with this mechanism. It is very simple, can be readily applied in a large variety of different situations and has been found thoroughly effective in actual practice. It is to be particularly noted that it places no strain upon the yarn inasmuch as the plate 23 can turn upward until the yarn escapes from the slot but that, however much the plate may lift or turn upward, it cannot turn backward because of the ratchet teeth 35 on the arm 32.

The very acute V-shaped notch 24 is particularly important in connection with the plurality of ratchet teeth on the arm or pawl 32. As the plate moves upward, the thread relatively moves into a wider portion of the V-shaped slot 24, that is, away from the rear end of the slot, and eventually the knot passes through the slot. At this time the ratchet 22 has caught the pawl-like arm 23 and the machine is stopped with no tension applied to the thread. If the knot is small it escapes through the slot quicker than if the knot or slub be large, but at the most, the only extraneous tension applied to the thread is that due to the weight of the very light plate 23, if no spring 34 is used, or the weight of the plate plus the tension of this very light spring 34. Whether the plate is lifted quickly or slowly, that is, whether the thread is running rapidly or slowly and whether the plate is lifted only a short distance or higher, the effect is the same. The plate contacts almost immediately with the arm 32 closing

the circuit through the stopping mechanism and then, though the thread may run on through inertia, yet there will be practically no tension on the thread. There is no chance in my construction, of the plate 23 falling back accidentally and leaving the knot to escape after once the plate is lifted. This gives a smoother action and closes the circuit in any position of the plate. If a knot is small and the machine is slow on account of a heavy load, it will lift the plate only into the first or second notch of the pawl 32, or if a heavier knot comes in contact with the walls of the slot, the plate will fly up to the last position without vibration and without moving forward or backward. If there was only one tooth to hold this plate, these two extreme cases would cause vibration of the plate either up or down and the plate would touch the thread and cause unnecessary tension on the yarn, the result of which would be a faulty drawn stitch in the cloth.

What is claimed is:

1. Knot detecting and stopping mechanism for textile machines, including a supporting member, insulated posts extending upward therefrom, a plate rotatably mounted in said posts, the plate having an inwardly extending slot through which a yarn is adapted to pass, the slot being of such width as to permit the free passage of the yarn when of a uniform diameter but preventing the passage of the yarn when knotted or thickened, the plate having a projecting lug at one end, a latch pivotally supported upon the said support and having an arm extending down over said lug, the arm being formed with ratchet notches, means for preventing the arm from contacting with the plate when the latter is in a lowered position, the ratchet notches in the arm engaging said lug and holding the plate raised, one of the posts supporting the plate and the latch being electrically connected in circuit with a stop motion actuating device.

2. Knot detecting and stopping mechanism for textile machines, including a support, a pair of posts extending upward from the support and insulated therefrom, a plate having pintles engaging in said posts, the plate being rotatable in a vertical plane and having a forwardly projecting middle portion formed with an inwardly extending slot through which yarn is adapted to pass, the walls of the slot engaging with a knot or thickened portion in the yarn whereby to cause the lifting of the plate when so engaged, the plate having a lug at one end, a third post extending upward from the support and insulated therefrom, a latch pivotally mounted upon said third post and having an arm extending outward and downward in spaced relation to the lug of said plate, the under edge face of the yarn having ratchet notches engageable with the lug when the plate is tilted upward, a spring urging the arm downward, and means connecting one of the first named posts and the third named post in circuit with a source of current and an electrically actuated stop mechanism.

3. Knot detecting and stopping mechanism for textile machines, including a plate mounted for free swinging movement in a vertical plane, the plate extending transversely to the run of the yarn, the plate having an open-ended acutely V-shaped slot extending inward from the free edge face of the plate and through which a yarn is adapted to pass, the slot permitting the passage of yarn when of normal diameter but preventing the passage of a knot or thickened portion

in the yarn until the plate has been turned upward a predetermined distance to permit the escape of the knot from the slot, a pawl carried by and movable with the plate, and a pivoted  
5 latch disposed above the pawl and engaging therewith when the plate is lifted by a yarn, the latch having a series of teeth which when the

pawl engages the latch will hold the plate at any one of a plurality of elevations and from return movement after being lifted by the yarn, the plate and the latch being electrically connected in circuit with a stop motion actuating  
5 device.

MITCHELL H. ROSENFELD.