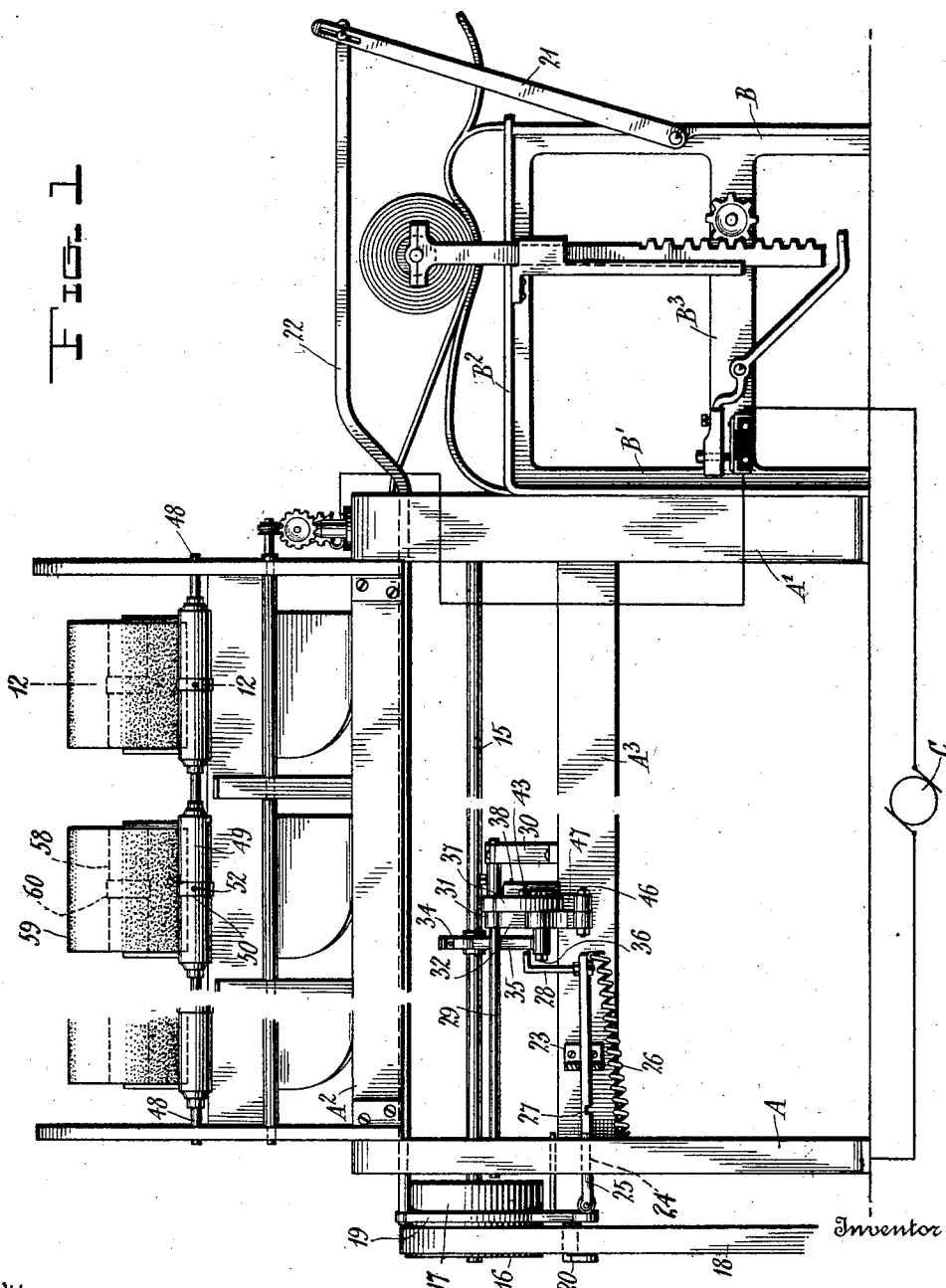


W. E. MORTON.
STOP MOTION.
APPLICATION FILED OCT. 11, 1909.

1,012,216.

Patented Dec. 19, 1911.

3 SHEETS-SHEET 1.



Witnesses
J. H. Johnson
Henry D. Bright

Worthington E. Morton
By *[Signature]*
Attorneys

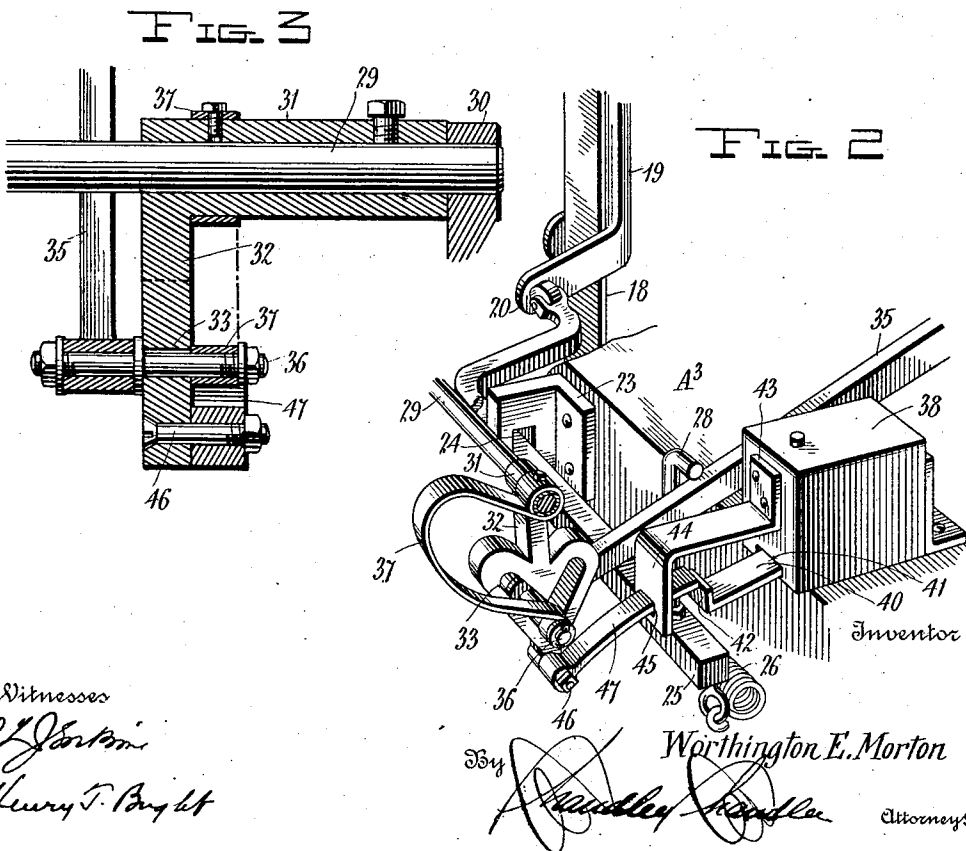
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FIG. 4

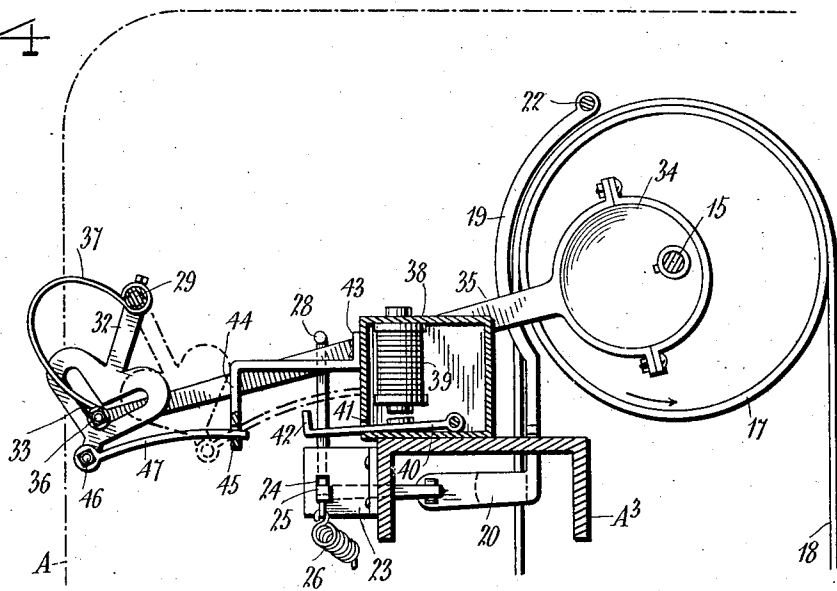


FIG. 5

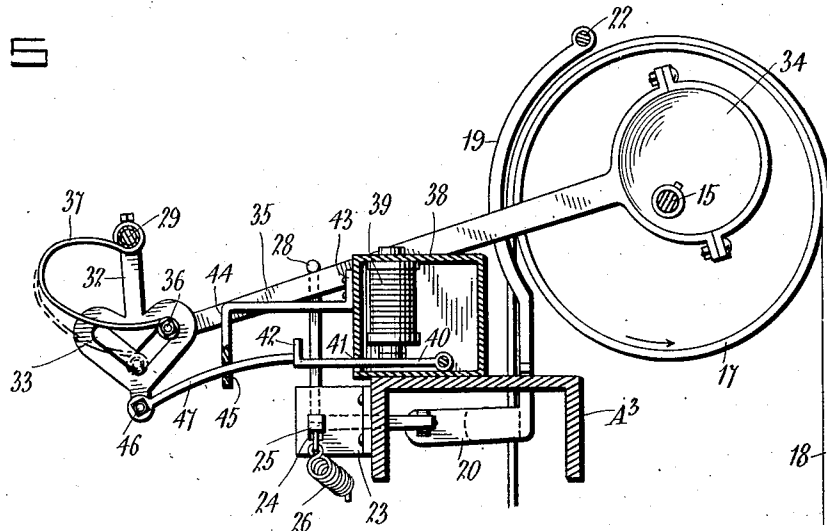
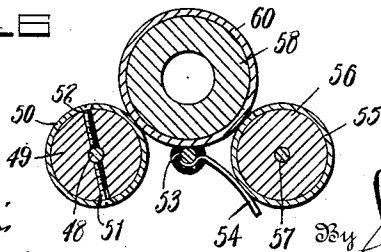


FIG. 6



Witnesses

H. T. Briggs
Henry T. Briggs

Inventor

Worthington E. Morton

W. E. Morton
W. E. Morton

Attorneys

UNITED STATES PATENT OFFICE.

WORTHINGTON E. MORTON, OF SHELBY, NORTH CAROLINA.

STOP-MOTION.

1,012,216.

Specification of Letters Patent.

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Application filed October 11, 1909. Serial No. 522,009.

To all whom it may concern:

Be it known that I, WORTHINGTON E. MORTON, a citizen of the United States, residing at Shelby, in the county of Cleveland, State of North Carolina, have invented certain new and useful Improvements in Stop-Motions; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to stop motions; and particularly to stop motions which are utilized in conjunction with machines adapted to receive, treat and deliver work in continuous form, to automatically disconnect the machine at a predetermined time from the power transmitting element.

In the operation of machines of the type named there is a great tendency for the continuity of the material passing through the machine to be broken or for same to be diverted from its true course, with resulting damage to the machine and the production of unsatisfactory work when the material is subjected to later processes.

It is therefore the object of this invention to provide a stop motion adapted to be applied to machines of the character named which will automatically stop the machine when a predetermined status exists in the work passing therethrough.

To this end the invention consists in an improved stop motion which comprises a normally restrained element constantly tending to release the connection between the machine and the power transmitting element, and a series of movable parts actuated by the machine, one of which is adapted for a given movement when a normal status exists throughout the work and for another movement when an abnormal condition in the work is present; said last named movement of said part serving to release the normally restrained element and thus detach the connection between the machine and the power transmitting element, the variations in the movements of said member being controlled by electrically operated means, which in turn is operated by a circuit adapted to be closed under various predetermined conditions.

For a more detailed understanding of the construction and operation of the invention same will be described with reference to the

accompanying drawings wherein like characters of reference denote corresponding parts in the several views; and in which,

Figure 1 is a rear elevation of a standard ribbon lap machine with the invention incorporated; the central portions of the machine being broken away; Fig. 2, a detailed perspective view of a fragment of one end of the machine showing the normally restrained element of the stop motion, and the mechanism utilized to directly effect the release of said element; Fig. 3, a detail view showing the connection between the rock arm and the actuated arm of the stop motion, the rock arm being shown in section; Fig. 4, a detail view of the rock arm, actuating arm and electrical apparatus for controlling the movements of the rock arm, the parts being shown in their inactive position with respect to effecting the release of the normally restrained element of the stop motion; Fig. 5, a view similar to Fig. 4, the parts being shown in position assumed when the normally restrained element of the stop motion is about to be released; Fig. 6, a section on the line 12—12 of Fig. 1.

Before proceeding with a description of the invention it will be noted that for the sake of clearness certain details of construction of the ribbon lap machine illustrated have been omitted in the various views, such details being immaterial with respect to and forming no part of this invention.

In the drawings A and A' represent respectively the samsons of a standard ribbon lap machine, suitably connected at their upper ends by a beam A² which is adapted to support directly and indirectly certain elements of the machine disposed thereabove. Positioned against the outer face of the samson A' is a supporting table for the elements of the machine which have directly to do with the delivery of the work therefrom; said supporting table being formed of the uprights B and B' connected at their upper ends by the beam B² and intermediate their ends by a cross beam B³. Connecting the samsons A and A' intermediate their ends is also a cross beam A³ and journaled in said samsons A and A' between the cross beam A³ and the beam A² is the main drive shaft 15 of the machine. A loose pulley 16 and a fixed pulley 17 are mounted on said drive shaft and a power transmitting belt 18 is adapted to shift from one pulley to

another to start and stop the machine as may be desired. The shifting of this belt from the pulley 16 to the pulley 17 and vice versa is accomplished through the medium of a belt shifting mechanism which comprises an arm 19 having one end provided with a strap fork 20 to receive the belt 18 and its other end connected by a link rod 22 to a lever 21 which is pivotally mounted on the upright B.

Secured to the cross beam A³ is a bracket guide 23 which has a slot 24 cut in the projecting portion thereof. Mounted for movement in the slot 24 and through the samson A so that the outer end thereof is adapted for engagement with the pivoted arm 19 is a thrust rod 25. A spring 26 has one end thereof secured to the inner end of the thrust rod 25 and the other end to the samson A; said spring constantly tending to move the thrust rod into engagement with the pivoted arm 19 so as to force said arm outwardly and thereby maintain the belt 18 upon the loose pulley 16. A notch 27 is cut in the bottom face of the thrust rod 25 in such position that when the belt 18 is on the fixed pulley 17 the notch engages with the guide bracket 23 and imparts to said bracket the office of a detent for normally restraining the thrust rod against the influence of the spring 26. The thrust rod 25 has secured thereto adjacent its inner end a latch or trip 28 which is adapted to be lifted to effect the disengagement of the thrust rod from the guide bracket in a manner to be hereinafter described.

A supporting rod 29 has one end mounted in the samson A and its other end in a bracket 30 which in turn is supported on the cross beam A³. Mounted on the rod 29 for a rocking movement is the rock arm 31 which is formed with a heart-shaped depending portion 32 provided with a V-shaped slot 33, whose sections are disposed substantially in the same direction as the diverging sides of the heart shaped depending portion of the rock arm.

Mounted on the shaft 15 so as to receive its movement therefrom is an eccentric 34 which is provided with an arm 35; the free end of said arm having a laterally extending finger 36 which projects through and is adapted to travel in the slot 33. To effect a simultaneous movement of the arm 35 and the rock arm 31 it will be necessary to hold the lateral projection of said arm 35 in a fixed position in the slot 33 and to this end a bow-spring 37 is provided which has one end secured to the horizontally disposed portion or journal of the rock arm and its other end secured to that portion of the laterally extending finger 36 which projects through the slot 33; the tension of said spring 37 serving to hold the laterally extending finger 36 in the lowermost por-

tion of the slot 33 and normally prevent any independent movement between the rock arm 31 and the arm 35.

Mounted on the beam A³ is a box-like casing 38 which carries therewithin a magnet 39 and a pivoted armature 40 adapted to be moved when said magnet is energized. A slot 41 is formed in one side of the casing 38 and the armature 40 projects there-through so that its free end will be disposed externally of said casing; said free end of the armature being bent at right angles to the body portion thereof as at 42 for a purpose to be presently described. A bracket 43 projects from the slotted side of the box 38 and terminates in a depending portion 44 which is also provided with a slot 45. The lower end of the depending portion 44 of the rock arm has formed thereon a laterally projecting stud 46 upon which is journaled a dagger 47 which passes through the slot 45 and is adapted for movement in said slot during the movement of said rock arm.

From the construction so far described it will be obvious that when the shaft 15 is rotated and the armature 40 is uninfluenced by the magnet 39 the movement imparted to the arm 35 will in turn be imparted to the rock arm 31; free movement of said rock arm being permitted by reason of the fact that the angular end 42 of the armature 40 is removed from the path of travel of the dagger 47; the movements of the arm 35 during this operation being such that the portion of the latch 28 which overhangs the arm 35 will not be engaged by said arm to release the thrust-rod from engagement with the guide bracket 23. However, it will be equally obvious that when the armature 40 is attracted by the magnet 39 the angular end 42 of said armature will be disposed in the path of travel of the dagger 47 and thus lock the rock arm 31 against movement. As the movement of the arm 35 is positive, and the rock arm 31 is locked against movement through the engagement of the dagger 47 with the angular end 42 of the armature, the finger 36 on the free end of the arm 35 will be forced upward in the slot 33 against the pressure of the spring 37, such movement of the arm 35 serving to effect its engagement with the latch 28 whereby the thrust rod 25 is released to shift the belt 18 from the fixed pulley 17 to the loose pulley 16.

The operation of the mechanism just described, with the armature 40 attracted to the magnet 39, is adapted to be effected under certain predetermined conditions as follows; first, immediately when the supply of material from any of the supply elements of the machine is exhausted; second, when the material is diverted from its normal course by attaching itself to the draft rollers and being wound thereupon; and third,

when a predetermined length of material has been delivered from the machine.

The operation of the mechanism for shifting or for disconnecting the machine from the power transmitting element is accomplished by the closing of an electrical circuit in which the magnet 39 is located.

The circuit which is adapted to be closed when the supply of material is exhausted from any of the supply elements of the machine, extends from one pole of the generator C, through the samson A, and thence through other metallic uninsulated portions of the machine and through the shaft 48 upon which the lap rolls 49 are mounted. Said lap rolls 49 are constructed of wood and have a metallic annular band 50 secured on the periphery thereof which constitutes one terminal of the circuit; said band being in turn electrically connected with the shaft 48 through the medium of the screws 51 and 52, which extend transversely through the roller 49. The other portion of the circuit is formed by connecting the opposite pole of the generator C with an electrical conductor, preferably of wire, which also forms the coil of the magnet 39 and attaching its terminal to the rod 53, which is mounted in the machine but suitably insulated therefrom. A spring finger 54 is mounted on said rod 53 and is adapted for continuous contact with a metal band 55 which is secured to the periphery of another lap roll 56; said last mentioned lap roll being in turn mounted upon the shaft 57 and having an annular band 55 mounted thereon which constitutes the other terminal of the circuit. Supported upon the lap rolls 49 and 45 are the lap spools 58 which carry the supply 59. The periphery of said spools 58 is likewise provided with an annular band 60 which is adapted to simultaneously contact with the band 50 of the roller 49 and band 55 of the roller 56 when the supply is entirely removed from said spools, thereby closing the circuit and instituting the actuation of the stop motion.

What is claimed is:

1. The combination of a machine for treating material in continuous form, including belt shifting mechanism held inactive against the constant tendency of a spring, a normally open electric circuit, means for closing the circuit when an abnormal condition exists in the material being treated, a magnet in said circuit, a vibrator having a V-

shaped slot therein, an eccentric operatively connected with the machine, an actuator arm mounted on said eccentric, a lateral extension on the free end of said actuator arm extending transversely through the slot on the vibrator, means normally holding said extension in the apex of said slot whereby said vibrator receives its motion from the actuator arm, an armature controlled by said magnet and positioned when said magnet is energized to constitute a stop to limit the movement of said vibrator in one direction and effect the shifting of the free end of the actuator arm from its normal position in the slot of the vibrator, and means operated by the movement of the actuator when the free end thereof is shifted from its normal position in the slot of the vibrator to release said belt shifting mechanism to the influence of its actuating spring.

2. The combination of a machine for treating material in continuous form, including belt shifting mechanism held inactive against the constant tendency of a spring, a normally open electric circuit, means for closing the circuit when an abnormal condition exists in the material being treated, a magnet in said circuit, a vibrator having a V shaped slot therein, an eccentric operatively connected with the machine, an actuator arm mounted on said eccentric, a lateral extension on the free end of said actuator arm extending transversely through the slot on the vibrator, spring actuated means normally holding said extension in the apex of said slot whereby said vibrator receives its motion from the actuator arm, an armature controlled by said magnet and positioned when said magnet is energized to constitute a stop to limit the movement of said vibrator in one direction and effect the shifting of the free end of the actuator arm from its normal position in the slot of the vibrator, and means operated by the movement of the actuator when the free end thereof is shifted from its normal position in the slot of the vibrator to release said belt shifting mechanism to the influence of its actuating spring.

In testimony whereof, I affix my signature, in presence of two witnesses.

WORTHINGTON E. MORTON.

Witnesses:

THOMAS L. JENKINS,
HENRY T. BRIGHT.