

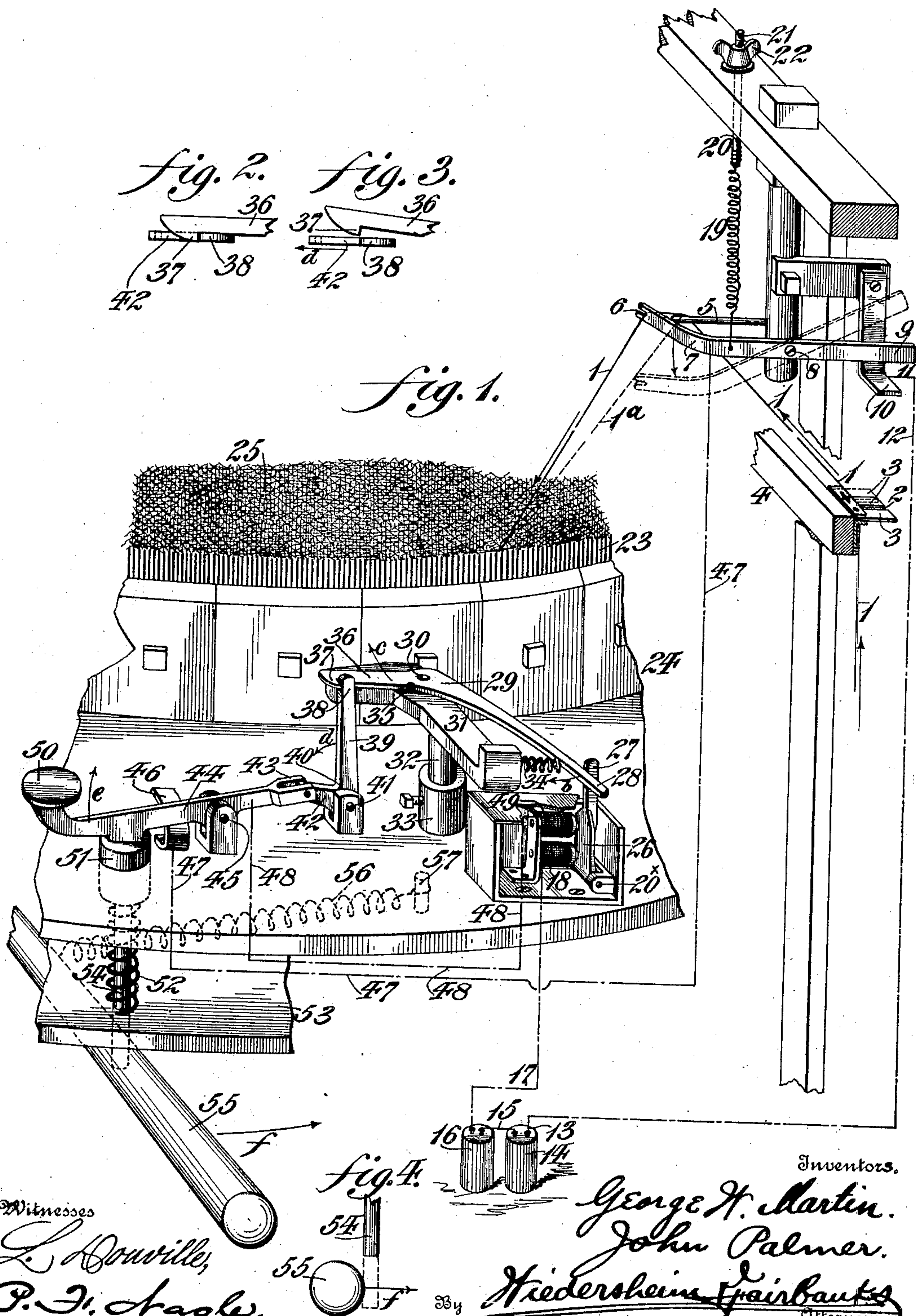
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G. W. MARTIN & J. PALMER.
AUTOMATIC STOP MOTION FOR KNITTING MACHINES.

(Application filed Nov. 21, 1900.)

(No Model.)



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AUTOMATIC STOP-MOTION FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 706,839, dated August 12, 1902.

Application filed November 21, 1900. Serial No. 37,220. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. MARTIN and JOHN PALMER, citizens of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Automatic Stop-Motions for Knitting-Machines, of which the following is a specification.

Our invention consists of an improved construction of an automatic electrically-operated stop-motion for a knitting-machine, wherein the breakage of the yarn or any knots or irregularity therein will cause an electrical circuit to be closed and by reason of auxiliary mechanism effect an instant stopping of the machine.

It further consists of novel details of construction, all as will be hereinafter fully set forth, and particularly pointed out in the claim.

Figure 1 represents a perspective view of an automatic stop-motion of a knitting-machine embodying our invention. Fig. 2 represents a plan view of a portion of the locking mechanism employed, the parts being shown in engagement or in operative position. Fig. 3 represents a plan view of the parts seen in Fig. 1 in disengaged position. Fig. 4 represents an end elevation of the shipping-lever and spring-actuated pin or abutment employed, showing the position the parts assume after the circuit has been closed.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, 1 designates the yarn or thread, which may be led from a bobbin or other suitable source of supply, (not shown,) said yarn passing through the opening 2 between the plates or guides 3, which may be adjusted with respect to each other, so that the width of said opening 2 may be varied according to requirements, said plates being supported upon the frame 4 or by any other suitable means.

The yarn 1 after passing through the opening 2 is conducted over the rod 5, which is supported in any suitable or convenient manner, said yarn passing thence through the notch or recess 6 in one limb of the lever 7, which is fulcrumed at the point 8 and has its

other limb 9 adapted to contact with the foot or piece 10, which latter has attached thereto the extremity 11 of the conductor 12, the other end thereof leading to the battery 14, from which lead the conductors 15 of the battery 16, from which latter lead the conductors 17 to the magnet 18.

19 designates a spring having one extremity attached to the lever 7, while the other end of said spring is secured to the rod 20, which has the threaded end 21, the latter being engaged by the thumb-nut 22, whereby it will be seen that the tension of said spring can be readily adjusted according to requirements.

The yarn 1 after passing through the notch or recess 6 is conducted to the needles 23 of the knitting-machine 24, which latter may be of any suitable construction, and as the structure and operation of this class of knitting-machines is familiar to those skilled in the art we do not deem it necessary to describe the same in detail, as it will be understood that our invention is applicable to any knitting-machine of this general class, the yarn 1 being knitted into fabric 25 in the usual manner.

26 designates an armature, which is pivotally mounted at 20^x and has the finger 27 attached thereto, said finger being adapted to contact with the limb 28 of the bell-crank or elbow lever 29, which has its fulcrum 30 upon a suitable bracket 31, the latter being supported by the post 32, which is adjustably mounted in the boss 33.

34 designates a spring, having one end attached to the limb 28 of said elbow-lever 29, the other end thereof being attached to the bracket 31 or to some other suitable fixed point, said bracket having thereon the pin or stop 35, whereby improper movement of the bell-crank 29 is prevented.

36 designates the other member or arm of the bell-crank 29, the same being provided with the shoulder or catch 37, which is adapted to engage the end 38 of the arm 39 of the bell-crank 40, which is fulcrumed at the point 41 and provided with the arm 42, which is pivotally engaged by the fork or extremity 43 of the lever 44, which is fulcrumed at the point 45, said lever when in its depressed or

locked position, as indicated in Fig. 1, being adapted to contact with the strip 46, from which leads the conductor 47 to the lever 7, it being noted that said lever 44 has the conductor 48, leading therefrom to the magnet 49, which may be located in proximity to the magnet 18, both of said magnets being supported in any suitable manner.

50 designates a head or finger piece on the lever 44 whereby the latter may be depressed according to requirements, said lever carrying the plunger 51, the under portion of which serves as an abutment for one end of the spring 52, the opposite extremity of said spring resting on the base or bed 53, through which passes the stem 54, the lower extremity of which serves as an abutment or stop for holding in position the shipping-lever 55, which latter is actuated by the spring 56, one extremity of the latter being attached to a suitable fixed point or pin 57, while the other end of said spring is secured to said shipping lever, the latter actuating suitable stopping and starting mechanism. (Not shown.)

25 The operation is as follows: The parts normally appear as seen in Figs. 1 and 2, and it will be apparent that as long as the yarn 1 passes freely through the opening 2, between the plates 3, the operation of the knitting-machine will be continuous. If, however, the free movement or travel of the yarn through the opening 2 should be checked for any reason, as by the yarn being knotted or in any other improper condition to be knitted into the fabric, it will be apparent that as the machine continues the operation of knitting a pull will be exerted on said yarn, which will depress the lever 7 into substantially the position seen in dotted lines in Fig. 1, and the yarn will leave the recess 6 in the lever 7 and will slip off the rod 5, and the spring 19 now acts to pull the lever 7 upwardly, thereby depressing the extremity 9 and causing the electric circuit to be closed by reason of the contact of said extremity 9 with the contact-point 10. The circuit being closed, it will be apparent by following out the electric connections that the magnets 18 and 49 will become energized, thereby drawing the armature 26 and the finger 27 in the direction of the arrow *b*, whereupon the arm 36 will be moved in the direction of the arrow *c*, and by reason of the tension of the spring 52 the arm 39 will move in the direction of the arrow *d* and the lever 44 will move in the direction of the arrow *e*. At this period the stem 54 will be thrown into the position indi-

cated in Fig. 4, and by reason of the tension of the contractible spring 56 the shipping-lever 55 will move in the direction of the arrow *f* and the knitting-machine will stop, it being of course understood that the extremity of the shipping-lever 55 communicates with suitable belt-shifting mechanism or other similar devices (not shown) which control the operation of the knitting-machine, and as these are familiar to those skilled in this art we have not deemed it necessary to show or describe the same in detail.

To reset the machine, it is only necessary to place the parts in the position seen in Fig. 1, after which the operation of knitting is continued until another irregularity or knot in the yarn reaches the opening 2, whereupon the circuit closing and tripping operations above described prior to the stopping of the machine take place.

It will be apparent by following out the electrical connections that there is no waste of the battery or other source of electrical energy, since the battery is only in use for the fraction of a second, which occurs during the completion of a circuit, which is formed by the contact of the parts 9 and 10, after which the operation of the tripping mechanism is effected, whereby it will be seen that the apparatus is very economical under all conditions and that there is no breakage of the yarn, the machine being automatically stopped.

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

In an electrically-operated stop-motion for a knitting-machine, a member or lever which is pivotally supported at substantially the center thereof, a spring secured to said lever to hold the lever in one position when the yarn is supported thereby and which yields when the tension thereof is overcome whereby the yarn is released from said lever a circuit-closing device on the other side of the pivotal point of said lever and with which the latter is brought in contact by the action of said spring and a stationary support over which the yarn passes before its engagement with said lever and which supports said yarn after released by said lever for convenience of resetting the parts.

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