(No Model.)

C. DRAPER.

ELECTRIC STOP MOTION FOR KNITTING MACHINES.

No. 382,593. Patented May 8, 1888.

Fig. 1.

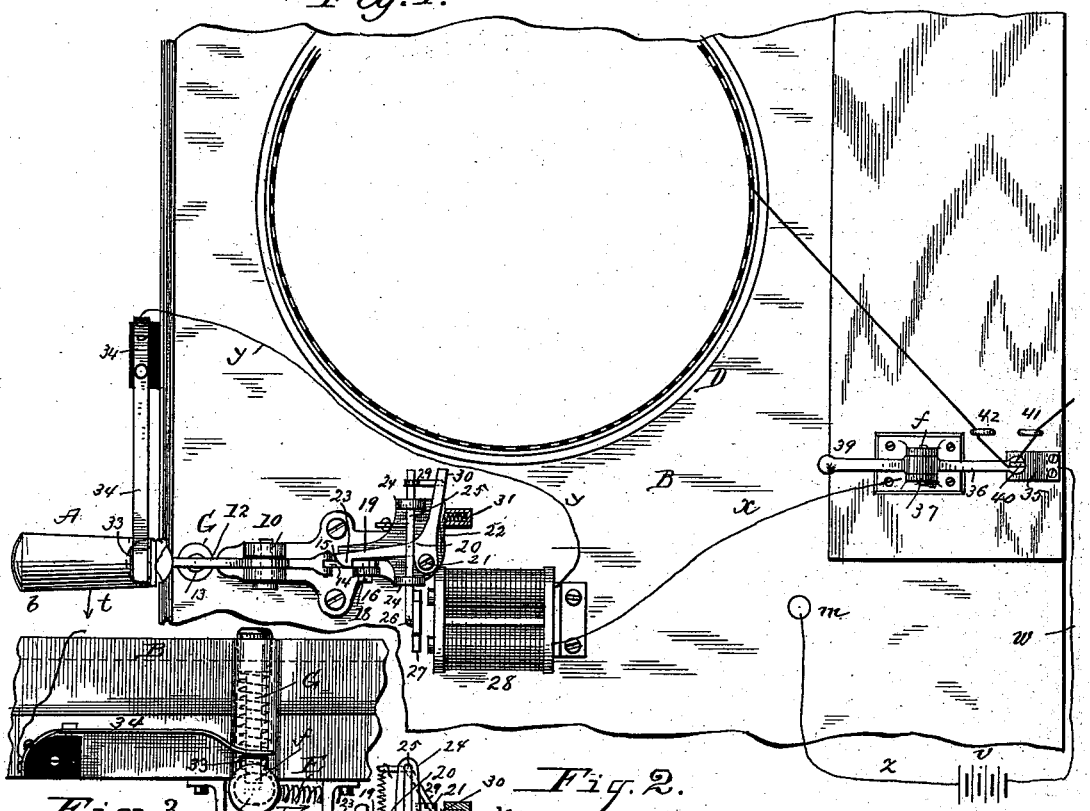

Fig. 2.

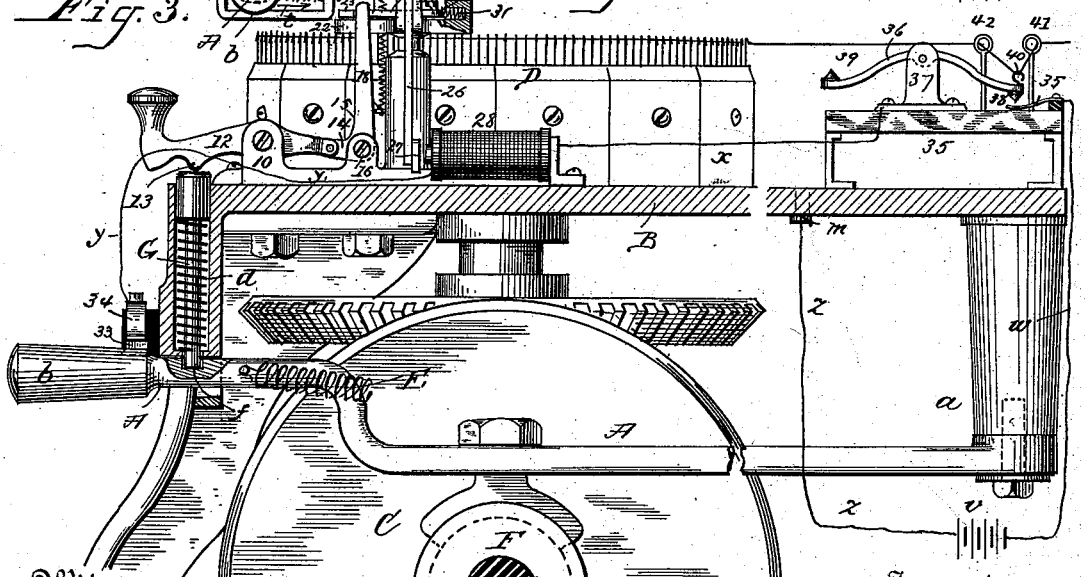

Fig. 3.

Witnesses

Wm. Sears Bellows Jr.

G. W. Chamberlain.

Inventor,

Charles Draper,

By his Attorneys

Coupland & Co

UNITED STATES PATENT OFFICE.

CHARLES DRAPER, OF SPRINGFIELD, MASSACHUSETTS.

ELECTRIC STOP-MOTION FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 382,593, dated May 8, 1888.

Application filed January 25, 1888. Serial No. 261,876. (No model.)

To all whom it may concern:

Be it known that I, CHARLES DRAPER, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Electric Stop-Motions for Knitting-Machines, of which the following is a specification.

This invention relates to stop-motions for knitting-machines which are actuated by electricity at the time of the breakage of the yarn or of an exhausted supply thereof; and the invention consists in the construction and combination of parts of and in relation to a knitting-machine, all substantially as will hereinafter more fully appear, and be set forth in the claims.

Reference is to be had to the accompanying sheet of drawings, in which the present invention is illustrated, and in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of a part of a knitting-machine, showing the location of the needle-cylinder and the devices employed for actuating the shipper-lever. Fig. 2 is in part a side elevation and in part a vertical cross-section of Fig. 1, and Fig. 3 is a detail view in front elevation illustrative of an electric switch which is employed in the present improved machine.

In the drawings, A represents the usual shipper or stop-motion lever, extending transversely of the machine under the bed B, and pivotally secured thereto at the rear side thereof, as at *a*, its forward end, *b*, projecting beyond the front of the machine, and intermediate of its length said shipper-lever engages with the clutch C upon the gear which engages the gearing for driving the knitting machinery in the needle-cylinder D, or, when the latter is driven by a belt-and-pulley connection, said shipper-lever engages the belt or belts thereof, and said shipper-lever normally and under the action of a spring, E, will be thrown or shifted so as to place the driving-connections between the main shaft F and the knitting machinery out of operative engagement, and when in position to place the driving-connections into engagement the shipper-lever is there retained or locked by the engagement therewith of a vertical bolt or plunger, G, adapted to be projected against the spiral spring *d* and entered by its lower end into a socket, *f*, of the shipper-lever, and there held under the action of certain securing or latching devices until same are automatically shifted under the severing of the yarn traveling to the needles; and said devices for securing such depression and retention of the said bolt, and for automatically securing its release, as aforesaid, will be now particularly described.

Pivotally mounted intermediate of its length in suitable ear-pieces, as 10, is a lever, 12, arranged and adapted to bear by a projection, 13, at its outer end portion upon the upper end of the spring-plunger G, its inner end pivotally engaging one leg, 14, of an angular lever, 15, pivoted, as at 16, in suitable stationary ear-pieces or bearings, its upwardly-extending leg 18 projecting into or beyond the horizontal plane of swing of one leg, 19, of a horizontally-disposed angular lever, 20, pivoted, as at 21, on a suitably-elevated stationary platen, 22, supported from the table, said leg 19 of the horizontal angular lever being formed with a shoulder or hook, 23, for engagement with the vertical leg 18 of angular lever 15. Above the plane of the horizontal angular lever 20 and turning in suitable bearings or ear-pieces, 24, of the platen 22 is a rocker-shaft, 25, provided at one end with a downwardly-extending leg, 26, at the lower end of which is secured an armature, 27, in proximity with which and in the usual manner is disposed an electro-magnet, 28. The other end of the rocker-shaft 25 has secured thereto or formed thereon a downwardly-extending projection or crank-arm, 29, projected to lie against or alongside of the outer leg, 30, of the said horizontal angular lever, a spring, 31, being applied between a suitable abutment of the platen 22 and the side of the said lever-leg 30 to place same normally in the position seen in Fig. 1, whereby the hooked portion 23 of the other leg, 19, will be in position for engagement with the upwardly-extending leg of angular lever 15.

33 represents a contact block or knob on the forward extension of the shifter-lever A, and 34 represents a spring-plate secured on an in-

sulating-block at the front of the machine-table, so formed that when the shifter-lever A is swung into the driving position, and as particularly shown in Figs. 2 and 3, the spring-plate 34 will rest on the said contact-block 33 of the shifter lever.

35 represents a contact-plate suitably placed in or near the line of travel of the yarn which passes from the supply to the knitting-needles, and 36 represents an arm intermediately hung, as at *f*, in suitable bearings, as 37, therefor, one end lying adjacent to the said contact-plate 35, and preferably provided with a spur or nose, 38, and such end is also provided with an eye, 40, and the other end, 39, of said tilting arm is preferably counterbalanced.

41 42 represent yarn-guiding eyes.

Connections for electrically operating the devices described are as follows: From one pole of the battery *v* a wire, *w*, passes to the contact-plate 35, and from the tilting arm 36 or some part of its support a wire, *x*, passes to the electro-magnet 28, and from thence a wire, *y*, passes to the spring or switching plate 34. From the other pole of the battery a wire, *z*, passes to a contact-point, *m*, on the bed of the frame.

In the guiding and travel of the yarn from the supply to the knitting-needles the same is passed through the eye 41, the eye 40 on the end of the tilting arm 36, and then through the eye 42 and to the knitting-needles, and the yarn is to be under such tension that the end 38 of said arm 36 will be held above and off of the contact-plate 35. If, however, from any cause during the running of the machine the yarn should become severed, it will then cease to support said contacting end 38 of the tilting arm, when such end, under its own weight, will fall to a bearing upon the said contact-plate 35 and a circuit will be closed, it being understood that the metallic parts of the knitting-machine complete the circuit between the spring-plate 34 and contact-point *m* to the battery, and obviously at the closing of the circuit the armature is attracted toward the electro-magnet, rocking the lever 25, and through its arm 29 forcing the end 30 of angular lever 20 outwardly, withdrawing its hooked end 23 from the engagement with the arm of angular lever 18, when the outer end, 13, of lever 12 is allowed to be moved upwardly, permitting the bolt G, under the reaction of its compressed spring, to be thrown out of engagement with the shipper-lever, when the latter, under the spring E, is swung horizontally—for instance, in the direction indicated by the arrows *t*—in a manner to disengage the driving-connections and stop the knitting mechanism, and at such time of movement of said shipper-lever the contact between the spring-plate 34 and said shipper-lever is automatically broken, thus breaking the circuit.

Other forms of switches or cut-outs than the spring-plate device 34 shown may, if desired, be employed; but such device is most simple and practicable.

What I claim as my invention is—

1. In a knitting-machine, the combination, with the shipper-lever A, the spring-actuated bolt G, the pivoted lever 12, and the pivoted angular lever 15, of the pivoted lever comprising the hooked leg 19 and the leg 30, the rocking shaft 25, provided with an armature and the arm 29, engaging said lever-leg 30, the electro-magnet 28, contact-plate 35, and the adjacent tilting arm 36, located in the line of travel of the yarn and adapted for being engaged and supported from said contact-plate thereby, a battery, *v*, and suitable electrical connections for forming a circuit, substantially as described, for the purpose set forth.

2. In a knitting-machine, the combination, with the shipper-lever A, the spring-actuated bolt G, the pivoted lever 12, and the pivoted angular lever 15, of the pivoted lever comprising the hooked leg 19 and the leg 30, the rocking shaft 25, provided with an armature and the arm 29, engaging said lever-leg 30, the electro-magnet 28, contact-plate 35, and the adjacent tilting arm 36, provided with the eye 40, the yarn supporting and guiding eyes 41 42, a battery, *v*, and suitable electrical connections for forming a circuit, substantially as and for the purpose described.

3. In a knitting-machine, the combination, with the shipper-lever A and the spring-actuated bolt G, the pivoted lever 12, and the pivoted angular lever 15, of the pivoted lever comprising the hooked leg 19 and the leg 30, the rocking shaft 25, provided with an armature and the arm 29, engaging said lever-leg 30, the electro-magnet 28, contact-plate 35, and the adjacent tilting arm 36, located in the line of travel of the yarn and adapted for being engaged and supported away from said contact-plate thereby, the contact-plate 34, arranged in relation to the said shipper-lever, substantially as described, a battery, *v*, and suitable electrical conductors between said battery and said contact-plate 34, between said tilting arm 36 and the electro-magnet, the latter and said contact-plate 34, and said shipper-lever and battery, substantially as and for the purpose described.

4. In a knitting-machine, the combination, with the shipper-lever A and the spring-actuated bolt G, the pivoted lever 12, and the pivoted angular lever 15, of the pivoted lever comprising the hooked leg 19 and the leg 30, the spring 31, bearing against the latter, the rocking shaft 25, provided with an armature and the arm 29, engaging said lever-leg 30, the electro-magnet 28, contact-plate 35, and the adjacent tilting arm 36, located in the line of travel of the yarn and adapted for being engaged and supported away from said contact-plate thereby, a battery, *v*, and suitable electrical connections for forming a circuit, substantially as and for the purpose described.

5. In a knitting-machine, the combination,

with the shipper-lever A and the spring-actuated bolt G, the pivoted lever 12, and the pivoted angular lever 15, of the pivoted lever comprising the hooked leg 19 and the leg 30, the spring 31, bearing against the latter, the rocking shaft 25, provided with an armature and the arm 29, engaging said lever-leg 30, the electro-magnet 28, contact-plate 35, and the adjacent tilting arm 36, provided with the eye 40, the yarn supporting and guiding eyes 41 42, the contact-plate 34, arranged in relation to the said shipper-lever, substantially as described, a battery, *v*, and suitable electrical conductors between said battery and said contact-plate 34, between said tilting arm 36 and the electro-magnet, the latter and said contact-plate 34, and said shipper-lever and battery, all substantially as and for the purpose described.

CHARLES DRAPER.

Witnesses:
H. A. CHAPIN,
G. M. CHAMBERLAIN.