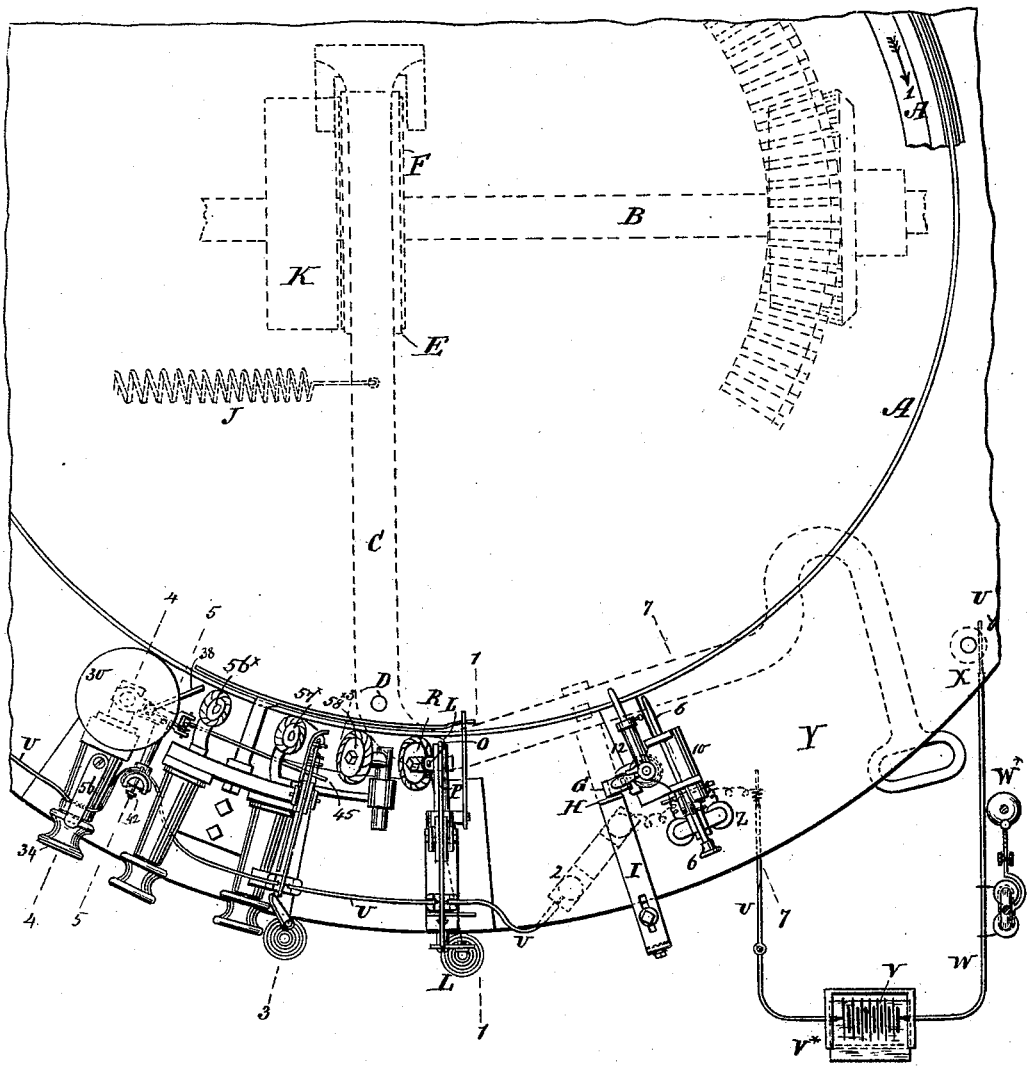
(No Model.) 3 Sheets—Sheet 1.

W. M. BELL.

ELECTRIC STOP MOTION FOR KNITTING MACHINES.

No. 491,004. Patented Jan. 31, 1893.

Fig. 1.



WITNESSES:

Edward Wolff.
William Miller

INVENTOR:

Winslow M. Bell.

BY
Van Santvoord & Hauff
his ATTORNEYS

(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

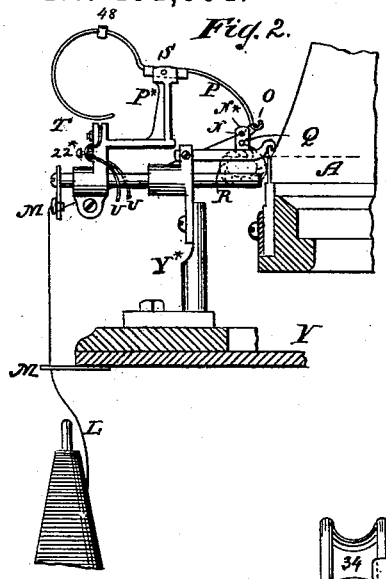

Fig. 3.

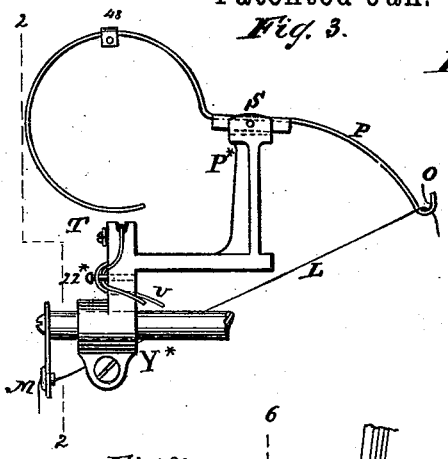

Fig. 4.

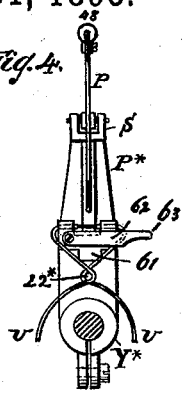

Fig. 7.

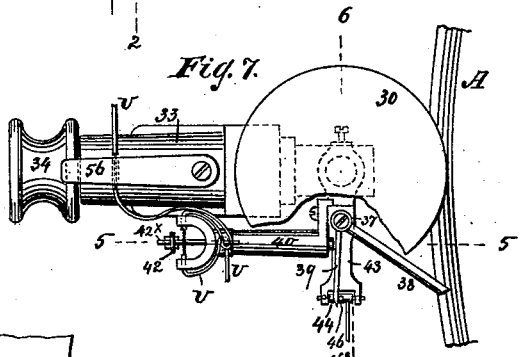

Fig. 5.

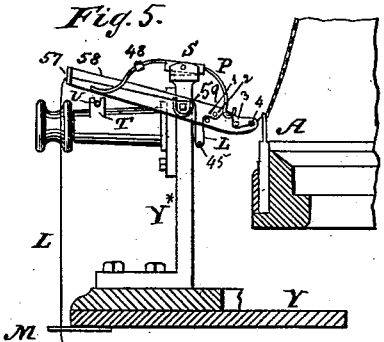

Fig. 6.

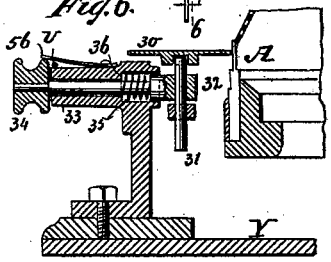

Fig. 8.

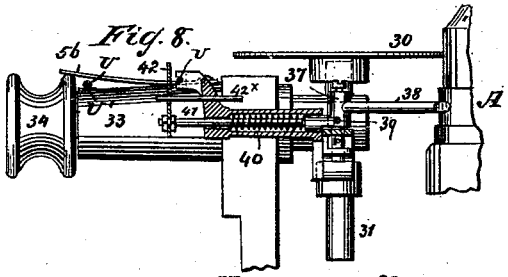

Fig. 9.

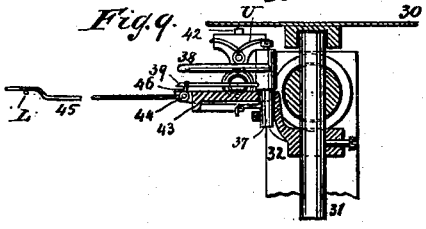

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Fig. 10.

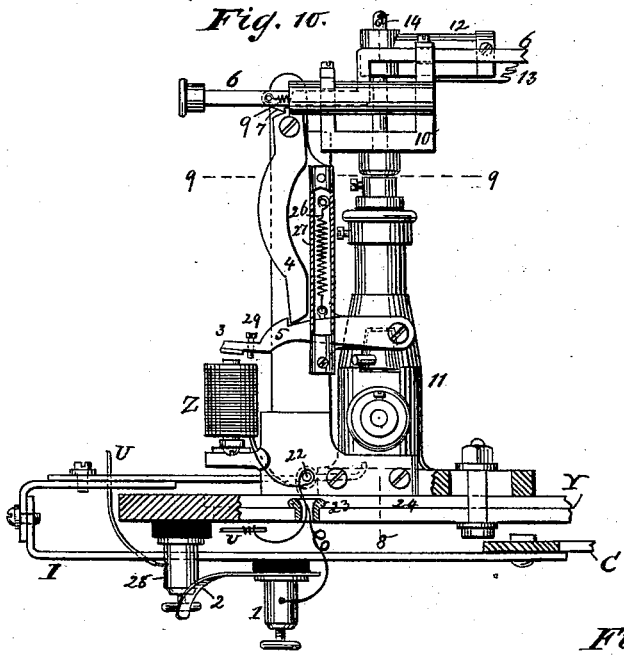


Fig. 11.

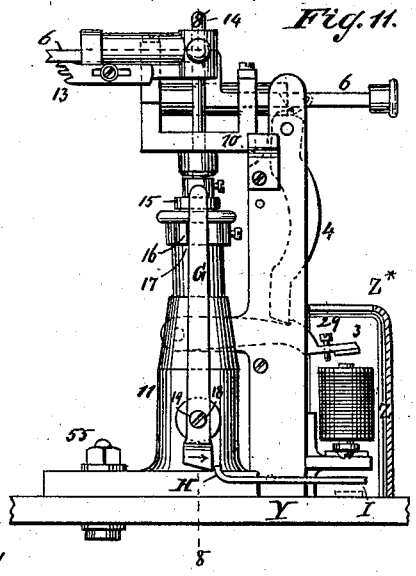


Fig. 12.

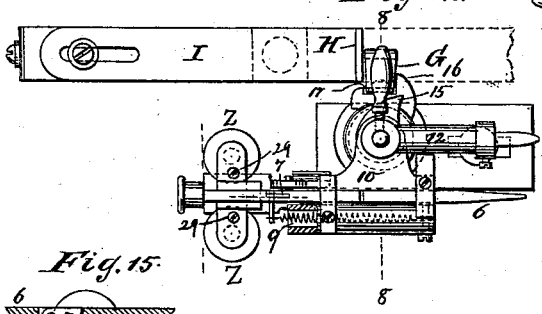


Fig. 14.

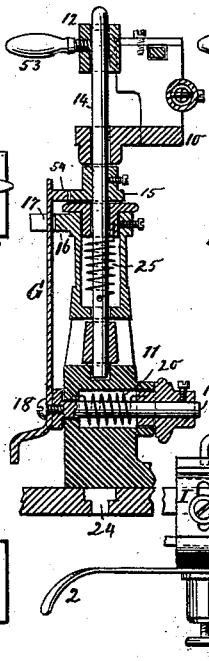


Fig. 13.

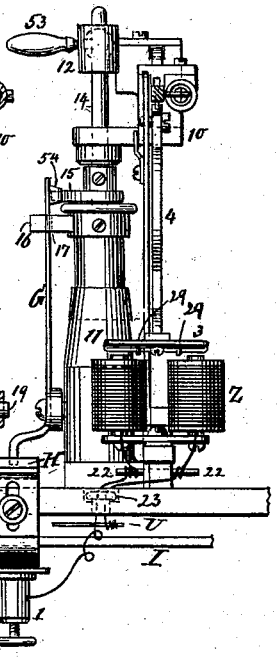


Fig. 15.

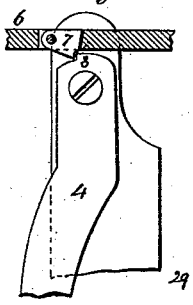
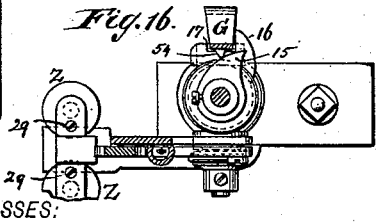


Fig. 16.



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UNITED STATES PATENT OFFICE.

WINSLOW M. BELL, OF MILTON, NEW YORK.

ELECTRIC STOP-MOTION FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 491,004, dated January 31, 1893.

Application filed December 18, 1890. Serial No. 375,139. (No model.)

To all whom it may concern:

Be it known that I, WINSLOW M. BELL, a citizen of the United States, residing at Milton, in the county of Ulster and State of New York, have invented new and useful Improvements in Electric Stop-Motions for Knitting-Machines, of which the following is a specification.

This invention relates to knitting machines and more particularly to electric stop motions therefor, and consists in the construction and combination of devices and features hereinafter described and claimed, reference being had to the accompanying drawings in which:—

Figure 1 is a top view of part of a knitting machine showing the location of the needle cylinder and other parts, and of devices for actuating the shipper lever. The arrow 1 indicates the direction in which the cylinder moves. Fig. 2 is a vertical section through the needle cylinder and bed plate on the line 1—1 of Fig. 1, showing the dropper and yarn detector in connection with the plush wheel. Fig. 3 is an enlarged view of part of the devices shown in Fig. 2. Fig. 4 is a vertical section taken on the line 2—2 of Fig. 3. Fig. 5 is a vertical section taken on the line 3—3 of Fig. 1 showing the yarn detector and dropper for operating with ordinary cotton yarn. Fig. 6 is a vertical section taken on the line 4—4 of Fig. 1 showing among other things the presser wheel and a portion of the needle cylinder, and the quarter saver, so called, for operating with a yarn detector in connection with ordinary cotton yarn. Fig. 7 is a top view of Fig. 6, the presser wheel being partly broken away, and the quarter-saver and a portion of the rim of the needle cylinder being shown. Fig. 8 is a side elevation of the presser wheel, together with a vertical section of the quarter-saver taken on the line 5—5 of Figs. 1 and 7. The figure includes also a portion of the needle cylinder. Fig. 9 is a vertical section on the line 6—6 of Fig. 7. Fig. 10 is an elevation partly in section showing the mechanism for working the shipper lever, the section being taken on the line 7—7 of Fig. 1. Fig. 11 is a side elevation of the opposite side of Fig. 10. Fig. 12 is a top view of Fig. 10. Fig. 13 is a front elevation of Fig. 10 partly in section. Fig. 14 is a vertical section taken on the line 8—8 of Figs. 10, 11 and 12. Fig. 15 shows on a larger scale the upper part of the locking device, see Fig 10, by which the mechanism for stopping the machine is held out of action, the sliding rod, 6, being held back by its latch 7. Fig. 16 is a horizontal section taken on the line 9—9, of Fig. 10, showing the cam that is brought into action when the spring plate G is to be released from the recess 17, of collar 16.

This invention relates to an electric stop motion for knitting machines which is brought into action by the breaking of the yarn as hereinafter explained.

The letter A designates a needle cylinder which is made to revolve by means of suitable gearing through the agency of driving shaft B as indicated in Fig. 1, or by belt and pulley, as preferred.

The shipper lever C which is pivoted at D to the bed plate of the machine is shown in the figure in the position which it will have when it has moved the driving belt E onto the fast pulley, F, in which position the shipper lever is locked by the foot of the upright spring plate, G, whose foot is interposed before a ledge, H, which rises from a spring arm, I, whose inner end is fastened to the shipper lever. The foot of the spring plate G is inclined so that when the shipper lever is pulled out to its position as represented in the drawings, the arm I yields and passes under the inclined foot and its ledge H becomes engaged by getting behind it as shown in Fig. 11. The spring J pulls the shipper lever in the direction of the loose pulley K whenever the foot of spring plate G is withdrawn from before the ledge H of the arm I, the said lever and the shipper lever being then free to yield to the action of the retracting spring J, which moves the driving belt to the loose pulley K and the machine stops running.

The foot of the spring plate G, is moved out of the way of the arm I, automatically, as follows: Observing Fig. 2, which relates to the plush thread or yarn, it is seen that said yarn goes from its spool through guides M to the machine, where it passes through an eye, N, thence over a hook, O, on the inner end of the dropper, P, and thence through another eye Q, and thence to the plush wheel R which delivers it to the needles. The eyes N Q are made in a short bar N*, that projects from

the upper part of the standard or "star" Y* and provides support also for the plush feed wheel R.

The dropper, P, consists of a wire frame provided at its inner end with a hook, as stated, and curved downward and inward at its outer end, and arranged to turn upon a pivot S, intermediate of its length. The outer end of the dropper is placed over a forked standard, T, between the forks of which it can pass when it swings on its pivot low enough. The outer end of the dropper is weighted by a movable weight 48 if desired. Sufficient tension is put on the yarn to pull the inner hooked end O of the dropper downward far enough to keep its outer end above and clear of the forked standard T. Through the forks of the standard there passes a wire U which is insulated at all parts except between the forks and which extends thence toward the positive pole of a battery, V.

A wire W extends from the other pole of the battery to the bed plate of the machine at X. When the yarn L is broken or runs out, the hook end of the dropper P, rises and contact is made by the outer end of the dropper with the naked part of wire U between the forks T, and an electric circuit is thereby completed from the negative pole of the battery through the said wire W, binding post X, bed plate of machine Y, standard Y*, dropper frame P*, pivot S, outward end of dropper, naked part of wire U between the forks T, wire U, binding post 28, flat spring 2, binding post 1, wire U, electro-magnets Z Z (which thereby attract the armature 3 at the same time releasing the swinging arm 4), thence through wire U to the positive pole of the battery. When the armature 3 closes upon the electro magnets the swinging arm 4, whose lower free end was held fast by the catch 5 on the back of the armature, is released, and the sliding pointed rod 6 which was prevented by the engagement of its catch 7 with the shoulder 8, on the upper end of the swinging arm 4, from moving, is allowed to slide endwise toward the needle cylinder in obedience to the tension of a coiled spring, 9, so combined and adapted with it as to give to the rod such endwise motion. When the sliding rod, 6, has made its endwise movement, the swinging arm 4, swings back of itself over the armature and its end again engages with the catch 5 on the back of the armature. The armature is held out of contact with the electro magnets by a coiled spring 26 in the barrel 27 as seen in Fig. 10.

The sliding rod 6 slides in a frame 10 which is free to turn on a spindle, 14, extending downward into a standard 11, that is supported on the bed plate of the machine and the frame 10 is caused to turn on said spindle by the contact of the pointed end of the sliding rod 6 with the cloth on the revolving cylinder, said cloth engaging with the end of rod, 6, after the latter has been moved endwise as above explained, the frame 10 being thereby caused to swing on the spindle 14 in the direction in which the needle cylinder and the cloth thereon are moving. This rotary motion of the rod 6 and its frame 10 is communicated to the frame 12 of the yarn and cloth detector, 13, which frame 12 is mounted on the same spindle 14 and is fastened thereon, the frames 10 and 12 being in such positions thereon that they can come in contact with each other, and the frame 12 is consequently also turned in the direction in which the cloth and needle cylinder are moving, when the frame 10 is so turned. The frame 12 of the yarn and cloth detector 13 is fastened to said spindle 14 by set screw 53 and they turn together on standard 11, as does the cam 15 which is also fastened on said spindle 14.

Below the cam 15 is a collar 16 which is recessed at 17 to receive the free end of the spring plate G, as shown in Figs. 12, 14 and 16. As long as the spring plate G is in said recess, the shipper lever C is locked in the position shown in Fig. 1, with the driving belt on the fast pulley. The spring plate G is taken out of said recess automatically as follows: When the frames 10 and 12 are turned as above explained, the point of the cam 15 comes against a nib 54 which projects inwardly from the upper end of the spring plate G toward and against the cam, and the spring plate is by the revolution of the cam pushed out of the recess 17. The lower end of the spring plate G is fastened by a set screw 18 in a recess in the end of the bolt 19 which is connected to a coiled spring 20 in a recess made for it in the lower part of the standard 11, the arrangement being such that the tension of the spring is constantly exerted to turn the bolt 19 and with it the spring plate G, in the direction of the arrow thereon, and thereby tend to keep the upper end of spring plate G in the recess 17 of collar 16. When by the working of the stop motion mechanism, the spring plate G is forced out of the recess 17, the tension of the spring J, pushes arm I beyond the lower part of spring plate G, turning the latter in a direction opposite the arrow thereon, and the shipper lever C will be moved inwardly by the action of spring J and the belt be placed on the loose pulley and the machine stopped. When the ledge of spring lever I, has passed inward under the foot of spring plate G, the tension of spring 20 restores the spring plate G to the position shown in Fig. 11. This movement of the arm I breaks the electric circuit by withdrawing from the circuit the connecting spring plate 2, which when the arm I is in the position shown in Fig. 1 extends from said arm I to binding post 28.

When the necessary repairs have been made to the yarn, or even before that is done, the operator pulls the slidiug rod, 6, back to its normal position shown in Figs. 10, 11 12, when its catch, 7, will engage the shoulder 8 on the swinging arm 4, the arm 4 having au-

tomatically swung back into the position shown in Fig. 10. This movement of the rod 6 draws it away from contact with the cloth, and allows the frame 12 to resume its normal position, see Figs. 10, 11, and 12, which is accomplished by the tension of the coiled spring 25 acting on spindle 14 to which the frame 12 is secured, the frame 12 being swung back to its normal position by the spring 25, when the cam 15 passes the nib 54 of spring plate, G, and said spring plate again engages the recess 17. The operator then pulls the shipper lever outward by its handle against the action of spring J and the machine resumes operation.

I prevent close contact of the armature with the magnets by means of set screws 29 that pass through it and regulate its position, and thereby prevent the magnets from becoming permanent magnets. This result can be accomplished in other ways, as for example, by inserting some suitable thin insulating material between the armature and the magnets or by any suitable stop limiting the extent of the movement of the armature. The electric wires after leaving the magnets, are wound around pins 22, 22, before they are passed down through the bed plate Y of the machine, and a passage way for them through the bed plate is provided by means of a porcelain guide or eye 23 fitted in the slot 24, in the bed plate, which is provided for securing and adjusting the stop motion to the bed plate, which slot is provided so that the eye 23 can be easily moved toward and away from the center of the knitting machine as different sized cylinders may be required, thus avoiding disconnecting or breaking of the wire U, which would be necessary if a number of holes were used instead of the slot. By "stop motion" I mean the connected devices represented in Figs. 10, 11, 12, 13, and 14.

In the foregoing description reference is made chiefly to Figs. 1, 2, 3, 4, 10, 11, 12, 13, 14, 15, and 16 and the device represented in them is in general terms referred to as the stop motion.

My electrical stop motion is applicable in the manufacture of plain hosiery, plush and stockinet and so forth. In Figs. 5, 6, 7, 8, and 9, I have shown how the same can be applied in the manufacture of plain goods, using a cotton or woolen thread, and in Figs. 2, 3, and 4 I have shown how it can be applied in making plush goods, the breaking or running out of the yarn causing an electric circuit to be closed and the stop motion to be brought into action.

Referring to Figs. 6, 7, 8, and 9, which contain the main features of the device known in the knit goods manufacture as quarter saver, the letter A designates the needle cylinder and the figure 30 designates the presser wheel which turns on a vertical shaft 31 supported in a sliding frame 32 that extends through a horizontal stationary tube 33 and is provided on its end which extends beyond the tube with a cap 34, which is drawn against the end of the tube by a coiled spring 35 arranged as shown around the frame 32 within the tube, so that one end bears against a shoulder 36 in the tube and the other end against a shoulder on the frame in such a manner that the presser wheel 30 is thereby pressed toward and against the needle cylinder.

Along side of the presser wheel and partly under it is a post 37 from which project rigid arms 38, 39, the longer and larger of which, 38, is intended to swing against the needle cylinder below the needles, having serrations on its end in order to prevent it from slipping against the cylinder, while the shorter one, 39, is intended as a keeper to hold back in its tube 40 a sliding bolt 41, which carries on its outer end beyond said tube, a vertical spring plate 42. The sliding bolt 41 is constantly pushed inward toward its keeper 39 by a coiled spring arranged in said tube 40, (see Fig. 8) and when the said keeper is removed, the force of said spring brings said spring plate 42, in contact with the insulated electric wire, U, (see Fig. 7) which extends between the forked ends of tube 40, and is naked at that place so that the spring plate by touching said wire can close an electric circuit there.

The spring plate 42 and sliding bolt 41, Figs. 7, 8, and 9, are guided by a stationary pin 42*, which extends through the forked end of tube 40, and is so arranged that one end serves as a guide for the spring plate 42 and the bolt 41, while its other end serves as a pin on which the electric wire U is fastened.

The post in which the arms 38, 39 are fixed has a lateral extension 43 with a forked end, between whose forks is a rocking bar 44, which has extending from it a yarn detector 45 whose end is sustained by the yarn L. From said bar also extends at almost a right angle with said yarn detector a stop 46 against which the end of the keeper 39 rests. When the yarn L runs out or breaks, the yarn detector 45 falls and turns the rocking bar 44 so that the stop 46 is removed from before the keeper 39, which is then swung out by the sliding bolt 41 under the action of the spring in tube 40 causing the other rod 38 to swing out against the needle cylinder, on reaching which, see Figs. 7 and 8, the serrated end of said rod engages it and the cylinder crowds against the rod and causes it to swing around to the position of a right angle with the cylinder or nearly so, in doing which the rod and the post 37 and the presser wheel and the sliding frame 32 and the cap 34 are moved outward away from the cylinder against the resistance of spring 35 causing the cap 34 to pass from under the flat spring 56 and allow said spring to come in contact with the naked electric wire U and close the circuit through the battery. The wire U is insulated from the tube 33 by the insulating material U', as shown in Fig. 8. When the yarn is restored, the operator brings the rods 38 and 39 to their normal positions and by the action of spring

35, the sliding frame 32 and cap 34 and the presser wheel resume their positions as shown in Fig. 6, the flat spring 56 being raised by the cap clear of the naked wire, so that the electrical circuit is broken. The shipper lever is then pulled out and the machine resumes operation.

In Fig. 5 an arrangement is shown which is adapted for feeding cotton thread or yarn to the needles, and is suitable in producing plain goods. In this example, the thread or yarn L is taken from the spool through a guide M and through an eye 57 formed in the outer end of the bar 58 which is supported on a standard or "star" Y* near the needle cylinder. The thread after passing through eye 57 extends along the bar to the guide 59 on which the bar is fastened and goes thence downward under the yarn detector rod 45, and thence over guiding pin 1, thence under guiding pin 2, thence over dropper hook O, thence under guiding pin 3, thence through the eye 4 formed in bar 58 near its end, and thence to the needles through the proper feed wheel, (not shown) by which the yarn is fed to the needles. It is apparent that tension is thus produced on the yarn close to the point where the yarn is introduced to the needles of the cylinder. The hook end of the dropper is held down by the thread L in such a manner that the outer end of the dropper is held up as shown in Fig. 5, above the electric wire U, so long as the thread remains unbroken, and the proper tension is maintained.

The dropper device shown in Fig. 5, is substantially the same as that shown in Figs. 2 and 3, and contains a wire frame P, adapted to turn on the pivot S, and provided at its end near the needle cylinder with a hook O. The outer end of the dropper P, is placed over a forked standard T, between whose forks it passes when it swings on the pivot S, low enough. Sufficient tension is put upon the yarn L, to pull the inner hooked end O, of the dropper, downward far enough to keep its outer end above and clear of the forked standard T, and of the electric wire U. When the yarn L, is broken, the dropper turns on its pivot and its outer end falls between the forks of standard T and touches the wire U, and causes an electric circuit to be established with the battery as before explained. When the tension is not maintained or the thread is broken, the hook end of the dropper is released and its outer end falls down upon the wire U, and an electric circuit is closed through the battery as before explained, the wire U, where it is supported between the forks of standard T, being stripped of its insulating coating.

The electric apparatus for stopping the machine can be applied to any stop motion, and when used without a stop motion the closing of the circuit may be employed to ring a bell as a signal of some accident to the yarn or the cloth. Such a bell may be placed in the apparatus at W* in connection with wire W, and can be arranged and operated in any usual manner for operating a bell by electrical means.

The battery V is placed in a suitable box V* provided with sides and cover of glass so that it is not only properly protected but its condition can be observed through its transparent walls.

I combine with the forked standard T of the dropper a holder of porcelain 61 shown in place in Fig. 4. Its office is to provide a proper non-conducting receptacle and protector for the electric wire U, so as to hold it in place and prevent accidental displacement of the wire and accidental closure of the electric circuit. The porcelain holder 61 can be made of separate parts, if desired, and can consist of U-shaped pieces adapted to be placed in the slots of the forks T. I also combine with the forked standard T, a lifting lever 62 which is pivoted on said forked standard and is provided with a handle 63. It is arranged so that it can be lifted above the level of the wire U, and thus serve as a stop to limit the descent of the dropper and keep it from contact with wire U and thus prevent the closing of the circuit, if the operator so desires.

It will be observed from the drawings, Figs. 1, 10, and 13, that the attachment of the insulated electric wires to the stop motion spring arm I is effected under the bed plate. The flat spring 2 and the binding posts 1 and 28 are insulated as shown in Fig. 10. The position of the dropper in the machine is such that its hook which supports the yarn is close to the plush wheel R, and also near the place which the burr wheel would occupy in Fig. 5. The electric wires on and near the dropper are passed around pins substantially as shown in Figs. 2, 3, and 4. The frames 10 and 12 being detachable, are readily lifted off from the stop motion when the operator is fixing the needles or doing any other work on the machine which requires easy access to it.

It will be observed, see Figs. 2, 3 and 5, that the dropper is directly attached to standards, Y*, of the machine, called "stars" by some knitters, and which are attached to the bed plate, and which carry the various wheels used in the knitting process. This arrangement is seen also in Fig. 1 where the plush wheel R is seen supported on a standard or "star," the dividing wheel 56* being mounted on another, the loop wheel or sinker burr 57*, being mounted on another and the clearing wheel 58* being mounted on another. The hinder part of the dropper frame P* is provided with a pin 22* for the purpose of supporting the electric wire U, which is wound around the pin. The wire is thereby made more or less rigid and is not liable, as a flexible wire would be to be interfered with by the operator in moving past the machine.

The forked end of tube 40, Figs. 7 and 8, may be made of porcelain so that the electric

wire U will be sustained there by insulating material, or by a material which is a poor conductor of electricity.

In order to protect the electro magnets Z from injury and prevent the accumulation of dust thereon, I have constructed a box Z*, which is provided with a slot through its top to enable it to be passed over the armature lever. The box is so applied as to be removable. For a representation thereof see Fig. 11.

What I claim as new, and desire to secure by Letters Patent, is:

1. In an electric stop-motion for knitting-machines, the combination with the bed-plate Y, the shipper-lever and its retracting-spring J, of the arm I, connected with said shipper-lever, the standard 11, spindle 14, therein, rotating frames 10, 12, carried by said spindle, the rod 6, sliding in the frame 10, and provided with a latch 7, swinging arm 4, engaging said latch, the cam 15 and recessed collar 16, on the spindle 14, spring-plate G, resting at its upper end against said cam and adapted to enter the recess in said collar and adapted to operate the shipper-lever, flat spring 2, electric battery V, wires U, W, electric-magnets Z, and armature 3, substantially as described.

2. The combination with a shipper-lever and its retracting spring, of an arm I connected to said shipper-lever and provided with a ledge H, the spindle 14, rotating frames, 10, 12, thereon, rod 6, sliding in frame 10, swinging arm 4, engaging the rod 6, a cam 15, on the spindle 14, a spring-plate G, resting at its upper end against said cam, and adapted to engage the ledge H, on the arm I, the flat spring 2, electro-magnet Z, armature 3, engaging the swinging arm 4, a battery V, and suitable electrical connections for forming a circuit, substantially as described.

3. In an electric-stop-motion for knitting machines, the combination of the bed-plate Y, the shipping-lever C, and its retracting spring, arm I connected with said shipping lever, flat springs 2, electro-magnets Z, armature 3, swinging arm 4, engaging said armature, standard 11, spindle 14, therein, rotating-frames 10, 12, on said spindle, a spring-actuated rod 6, sliding in the rotating frame 10, and provided with a latch 7, engaging the upper end of the swinging arm 4, a cam 15 and recessed collar 16, on the spindle 14, a spring-plate G, the upper end of which rests against the cam 15, adapted to enter the recess in said collar and adapted to operate the shipper-lever, electric wires U, W, and battery V, substantially as described.

4. In a knitting-machine, the combination with a sliding frame carrying the presser wheel, of a quarter saver mounted in said frame and having a rod 38 provided with a serrated end, a tube 40 containing a spring pressed sliding bolt 41, and means connected with said sliding bolt, operated by the breaking of the yarn to throw the serrated end of said arm 38 against the head of the cylinder whereby the presser-wheel is caused to move out of contact with the needles, substantially as described.

5. The presser wheel 30 mounted on a post or shaft 31, in combination with the yarn detector 45, the tube 40, the spring actuated sliding bolt 41 therein, the arms 38 and 39 mounted on the post or shaft 37, said arm 39 being arranged to lie in front of said sliding bolt 41, to keep said bolt out of contact with the wire U, spring plate 42 and wire U, substantially as shown and described.

6. In a knitting machine, the combination of a sliding frame 32, a presser-wheel 30 mounted therein, a post 37, carrying arms 38, 39, and a tube 40, a spring actuated sliding bolt therein, a rocking bar 44, having a yarn detector 45 extending therefrom, a stop 46, against which the end of the arm 39, rests, a spring-plate carried by the sliding bolt 41, and electric wires U, W, substantially as described.

7. In a knitting machine, in combination with a frame 10, and a spring-actuated sliding rod therein, of the magnet Z, armature 3, and swinging arm 4, engaging said armature and said sliding rod, whereby said sliding rod is projected against the cloth on the cylinder on the closing of an electric circuit through the magnet Z, substantially as described.

8. The combination with the standard 11, spindle 14, therein, detachable frame 10 and frame 12 on said spindle, and the spring actuated rod sliding in said frame 10, provided with a catch 7, of the swinging arm 4, engaging the catch on the sliding rod, the armature 3 having a catch 5, to engage the swinging arm 4, whereby when the rod is released it will move toward the cylinder and its serrated end will engage with and be turned by the revolving cloth, substantially as described.

9. The frame 10 provided with the rod 6, having a catch 7 and the automatic and self-setting swinging arm 4, in combination with the armature 3 and its catch 5 with which the swinging arm automatically engages, substantially as described.

10. In combination with the frame 10 and the spring actuated sliding rod 6 therein, of the swinging arm 4 having a shoulder or catch adapted to engage the rod 6, the armature, armature-lever 3 having a catch 5, and the spring 26, connected with the armature lever normally operating to retain the armature lever in engagement with the arm 4, substantially as described.

11. The frame 10, in combination with frame 12, the spring-actuated sliding rod 6, the spindle 14, and standard 11, arranged so that said frame 10 is detachable from said spindle and standard, substantially as shown and described.

12. The combination with the forked standard T, the electric wire U and the dropper P, of the lifting lever 62 provided with a handle 63, constructed and adapted for limiting

the extent of the downward motion of the dropper, substantially as shown and described.

13. The combination with the quarter saver, the spring-actuated sliding bolt 41, the spring plate 42 and electric wire U, of the stationary pin 42*, the tube 40 and the piece 43 on which it is mounted, the yarn detector 45, the stop 46, and the rocking bar 44, substantially as shown and described.

14. In an electric stop-motion for knitting machines, the combination with the bed-plate, the shipping-lever and its retracting spring; the arm 1 connected with said shipping lever, flat spring 2, electric wires U, W, battery V, electro-magnets Z, armature 3, the standard 11, spindle 14, stepped therein, rotating frames 10, 12, spring-actuated rod 6, sliding in the frame 10, and provided with a latch 7, a swinging arm engaging said latch 7 and a latch on the armature 3, a cam 15 and recessed collar 16 on the spindle 14, a spring plate G adapted to operate the shipping-lever, resting at its upper end against the cam 15 and adapted to enter the recessed collar 16, of the plush wheel R, for delivering the yarn to the needles, the dropper P, pivoted upon a support P* and having a hook O at its inner end in proximity to the plush wheel R, substantially as described.

15. In an electric-stop-motion for knitting machines, the combination with a shipper-lever and means engaging the same to retain the machine in operation, of mechanism for releasing said shipper lever, consisting of a magnet, an armature, a swinging arm engages by said armature, the spindle 14, the frames 10 and 12 on said spindle, the spring-actuated sliding bar 6, in the frame 10, and the self-acting catch 7 on the sliding bar, engaging the swinging arm, substantially as described.

16 In an electric stop motion for knitting machines, the combination of the spindle 14, the frames 10 and 12 thereon, the spring-actuated sliding bar 6 in the frame 10, and the self acting catch 7, on the sliding bar 6, with the swinging arm 4 the shoulder 8 thereon, armature 3, provided with catch 5, and the electric magnets 22, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WINSLOW M. BELL.

Witnesses:
J. VAN SANTVOORD,
E. F. KASTENHUBER.