

(No Model.)

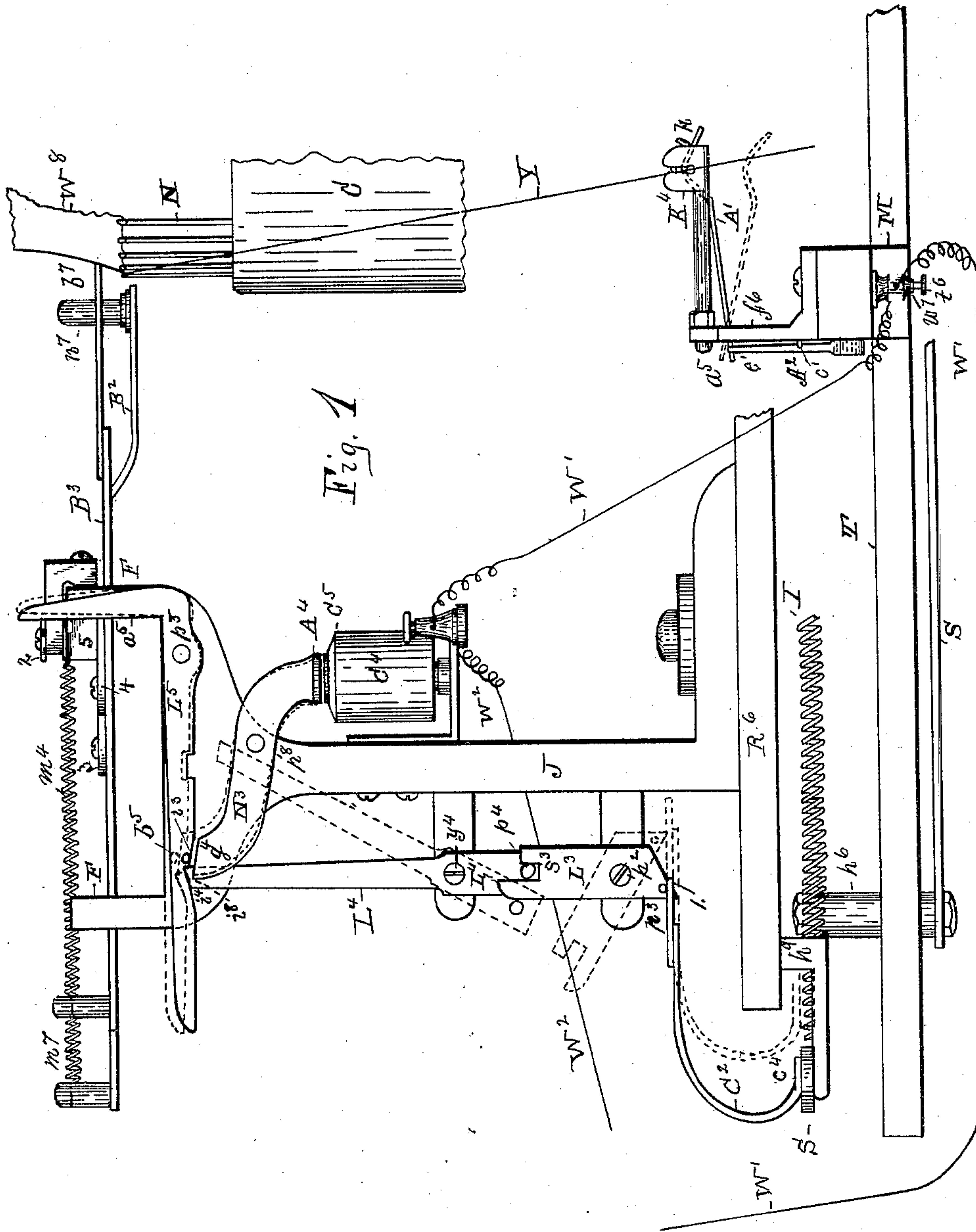
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E. G. CONNER.

ELECTRICAL STOP MOTION MECHANISM FOR KNITTING MACHINES.

No. 397,537.

Patented Feb. 12, 1889.



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Edward G. Conner INVENTOR.

By W. E. Hagan his atty

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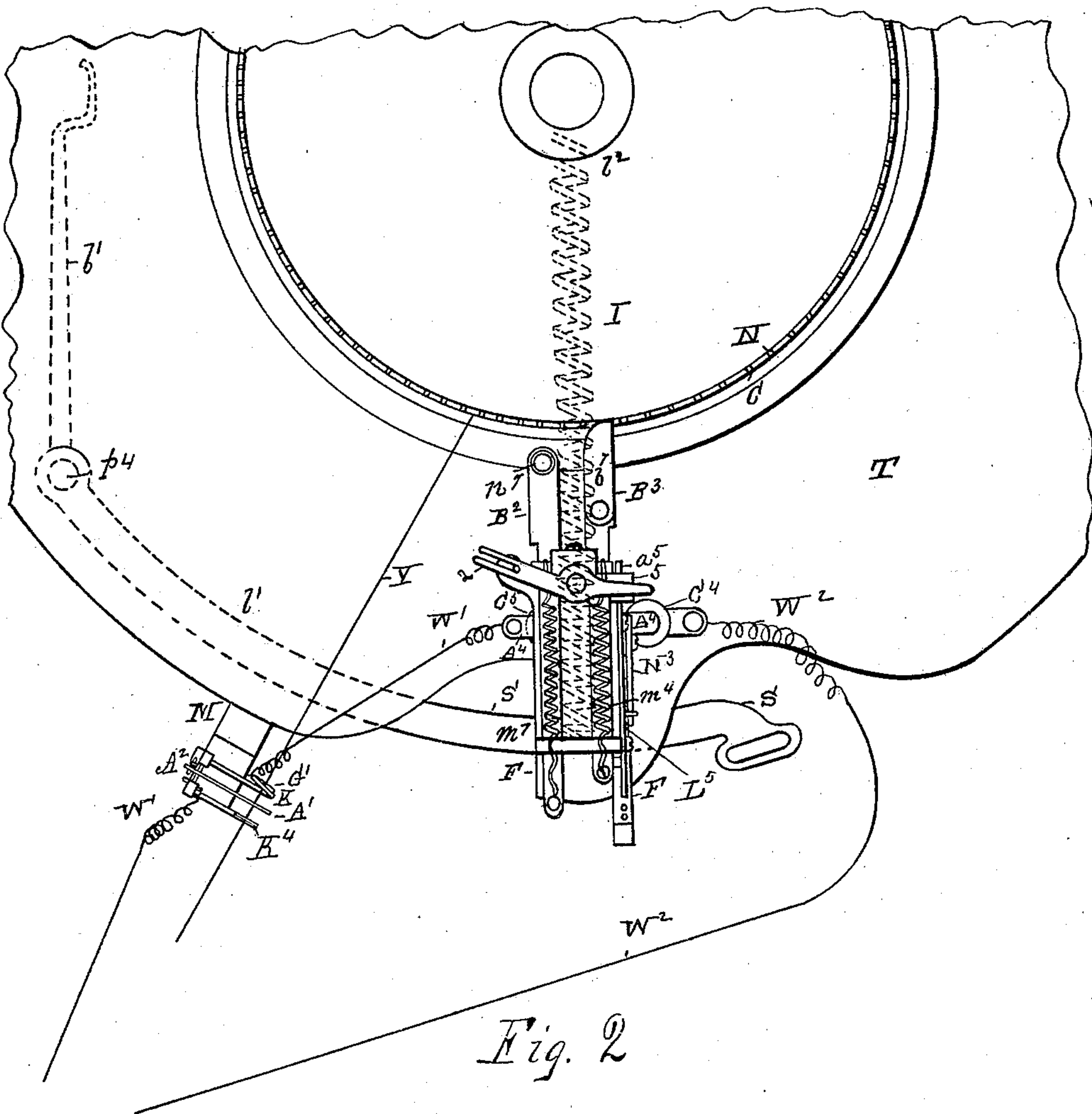
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UNITED STATES PATENT OFFICE.

EDWARD G. CONNER, OF VALATIE, ASSIGNOR TO TOMPKINS BROTHERS,
OF TROY, NEW YORK.

ELECTRICAL STOP-MOTION MECHANISM FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 397,537, dated February 12, 1889.

Application filed January 30, 1885. Serial No. 154,421. (No model.)

To all whom it may concern:

Be it known that I, EDWARD G. CONNER, of Valatie, Columbia county, State of New York, have invented a new and useful Improvement in Electrical Stop-Motion Mechanism for Knitting-Machines, of which the following is a specification.

My invention relates to electrical stop-motion mechanism for knitting-machines; and it consists in the novel construction and combination of parts and their agroupment with electrical forces or means, as will be hereinafter more fully specified, and especially as the same is pointed out in the claims.

I have fully illustrated my improvements in the accompanying drawings, wherein—

Figure 1 shows a side elevation of a part of a knitting-machine cylinder and a part of its needles with my improved stop motion applied thereto, the latching mechanism, the magnet and armature operating the same being shown in comparatively a larger proportion than the other parts. This figure also illustrates the connection of the pivoted ship-
ping-lever with the latching mechanism, and also a means for operating the latching mechanism when a hole occurs in the web. Fig. 2 shows a top view of the parts shown at Fig. 1, but without the comparative enlargement of some of the parts shown therein. Fig. 3 shows a side elevation of the frame and inclosure containing the circuit-closing mechanism. Fig. 4 is a longitudinal section of the mechanism shown at Fig. 3. Fig. 5 is a top view of the inclosure containing the circuit-closing plate and a pivoted drop-lever which operates it, the inclosure being shown with the cover which incloses the parts at the top removed. Fig. 6 shows as detached a perspective of a pivoted lever constructed to rest on the yarn passing to the needles and to fall when the yarn breaks to release in falling a pivoted drop-lever that operates a circuit-closing plate. Fig. 7 shows as detached a perspective of the pivoted lever which operates the circuit-closing plate. Fig. 8 is a plan view of the means for mechanically stopping the knitting-machine by engagement with the web when a hole is produced therein, the parts be-

ing shown more in detail than they are in Fig. 2.

The several parts of the mechanism thus illustrated are designated by letter reference, and the function of the parts is described as follows:

The letter T designates the knitting-machine table, C its cylinder, N the needles, and Y the yarn passing to the needles.

The letters W' and W² designate the circuit-wires leading to a battery, (not shown,) and the letter M designates a bracket attached to the machine-table by a bolt passing through it and the table side, as indicated at b⁶ of Fig. 3. This bracket at its upper end is forked so as to produce the upcast standards f⁶ f⁶, as indicated at Fig. 3, and the bottom of this bracket is made with an inclosure, E, as indicated at Figs. 4 and 5.

The letters w⁶ and w⁷ designate wire-holders, each of which is provided with a set-screw, t⁶, to connect and keep in place one of the circuit-wires. The letter D designates a circuit-closing plate made of thin sheet metal that has a weak spring capacity.

The letter s⁶ designates a screw passed through one end of this plate and into an insulating-tube, t², arranged within the inclosure E, so as to pass through the bottom of the latter and extend below it with said screw s⁶, where below the insulating-tube connecting with the wire-holder w⁶. From where thus attached at one of its ends the plate D is bent downward and extended laterally, so as to rest on the top of the shorter screw, s⁷, which latter extends downward through an insulating-tube, t³, the latter being also within the inclosure E and extended downward through the bottom of the latter, and where said screw extends below said insulating-tube t³ it connects with the wire-holder w⁷. As thus arranged, when the plate D is down on the screw s⁷, the circuit is made between the wires by the plate D; but when the latter is raised up from off the screw s⁷ the circuit is broken. This plate D is made with a shoulder or jog projected from one of its sides, as indicated at j⁴, Fig. 5.

The letter A² designates a circuit-closing drop-lever that is made with a pivotal rod, r⁴,

the latter having its bearings at b^5 b^5 in the opposite sides of the inclosure E, and being projected through one side of the latter and the bracket, so as to outwardly project there-
5 from.

The letter e' designates the arm of the drop-lever, which is attached to that part of the pivotal rod which is projected beyond the bracket side, and e^3 designates an offset arm
10 or tappet which is arranged on that part of the pivotal rod r^4 which is within the inclosure E, and so as to engage with the shoulder j^4 of the plate D on the under side of the latter thereat. As thus constructed, when the
15 arm e' of this drop-lever is raised up to a vertical position, then the offset arm e^3 engages with the under side of the shoulder j^4 on the plate D to raise the latter from off the screw s^7 , thus keeping the circuit broken and open
20 with the lever-arm in the position shown at Fig. 3, and the plate D, as shown by the dotted line d^6 at Fig. 4; but when the arm e' falls or turns downwardly from a vertical position, as indicated by the dotted line d^5 of Fig. 3,
25 then the plate D descends onto the screw s^7 , as shown at Fig. 4, and the circuit is closed.

The letters c' c' designate pins that are projected from the side of the bracket M, as indicated at Fig. 3, they serving to regulate the
30 distance which the arm e' shall move around and the measure of its pivotal rod's rotation, said arm being arranged between said pins.

The letter A' designates an arm made with trunnion-bearings b^2 b^2 , adapted to journal in
35 the inner and opposite faces of the standards f^6 f^6 , as indicated at n n . At its end most remote from its hinged connection this arm A' is bent to form a curve, k , so as to rest thereat upon the passing yarn. At its end
40 nearest to its hinging-connection it projects beyond the latter, as indicated at a^5 . Where thus extended the arm a^5 holds up in a vertical position, by contact with its side and at its upper end, the drop-lever A², as shown at
45 Fig. 3. Thus arranged, so long as the yarn remains intact on which the end k rests, the other end, a^5 , of the arm A' will hold up the drop-lever and keep the circuit broken; but if the yarn breaks, then the outer curved end,
50 k , falls. This releases the drop-lever A², and the circuit is closed through the holder w^6 , the spring-plate D, and the holder w^7 .

The letters K⁴ and G' indicate yarn-guides.

The letter S designates a pivoted belt-shipper lever, which is pivoted at p^4 , as indicated
55 by the dotted line l' of Fig. 2, and the letter I designates a spring, which at its inner end is connected at l^2 to a fixed point, and at its outer end is connected to said belt-shipper
60 lever. This latter is drawn out against the force of the spring I (until the post h^6 on said lever abuts against the bracket h^9 on the under side of the bracket R⁶) to put on the belt which operates the knitting-machine cylinder,
65 and thus held by a catch, and when unlatched then the spring draws in the lever and auto-

matically throws off the belt, this being a well-known means.

The letter C² designates a catch that is attached to the belt-shipping lever at c^4 , and
70 then carried upwardly and inwardly toward the machine, and has formed in its free end an open-ended slot, l , to engage with the lower end of the latch L³, as indicated at l in Fig. 1.

The letter B² indicates a bar that is adapted to slide in the frame F, which bar at its outer end connects with a spring, m^7 , attached to the frame, and at its inner end is constructed
75 with a stud, n^7 , that is adapted to receive a wheel, n^{17} , that runs on the surface of the web w^8 . This wheel and the bar B² form no part of my invention, and the wheel is shown in Fig. 8 only of the drawings.

The letter B³ designates another bar adapted
85 to slide outwardly and inwardly toward the web in the frame F, and at its outer end provided with a spring, m^4 , that connects with the frame. This bar B³ on its end nearest the web is constructed with a blade, b^7 , adapted
90 to run on the web, and should a hole be made in the latter, this blade engages with the web thereat to spring the latching mechanism and throw off the belt. This bar B³, as shown and described, forms no part of the invention
95 herein claimed, but is used to operate the same latching mechanism as the electrical mechanism, and independently from that containing my invention.

The letter L³ designates a vertically-ar-
100 ranged latch that is pivoted at p^2 , and is provided with a pin, p^3 , at its lower end adapted to rest across the slot in the end of the catch C² of the belt-shipping lever, as indicated at Fig. 1, and at its upper end this lever L³ is
105 provided with a slot, s^3 , to receive a latch-pin, p^4 , on the lower end of the latch L⁴. The latch L⁴ is pivotally supported at y^4 and has its upper end, i^8 , formed to engage with a notch, i^4 , in the under edge of the latch L⁵, and is
110 held in vertical and locked position by the pressure of the catch C² in engagement with the lower end of the latch part L³, and the parts remain thus locked until the long arm of the latch L⁵ is raised by the armature or
115 otherwise high enough to release the end of the lever L⁴ from engagement with the notch i^4 , when the catch C² is drawn inward by the spring I, as indicated in dotted lines, and carries the lower end of latch L³ with it, thus
120 breaking the connection of the latches L³ and L⁴ and stopping the machine. The latch L⁵ is pivoted at p^5 , and is formed with a vertical arm, a^5 , which contacts with or sits against the arm of a lever, 2, pivoted on the frame F
125 and having a forked end engaging with a pin on a guard, 3, on the bar B². When the bar B² is pressed back by an obstruction or by design, the arm of the lever 2 moves the arm a^5 and lifts the latch L⁵ from engagement with
130 the lever L⁴, thus bringing the stopping mechanism into operation. On the bar B³ is se-

cured a guard, 4, having a lateral projection, 5, which contacts or sets against the arm a^5 , and when a rent or hole is made in the web the bar B^3 is moved forward by its spring m^4 , causing the projection on the guard to move the arm a^5 , which lifts the latch L^5 and releases the latch L^4 , breaking its connection with L^3 and setting the stopping mechanism in operation. The bar B^3 normally rests with its curved face end against the web, so that when a break occurs in the web the action of the spring slides the bar forward in the hole in the web.

The letters C^4 C^5 designate the helical magnet-coils, each one of which is connected with one of the wires W^1 W^2 , leading to a battery, with the plate D of the inclosure E forming, when down on the screw s^7 , a part of the circuit.

The letter A^4 designates the armature, and N^3 the armature-lever, which is pivoted at p^8 , the latter being curved upwardly from where pivoted, so that when the magnet is not excited the outer end, g^4 , of this armature-lever N^3 will rest under the pin b^5 of the latch L^5 ; but when the circuit is closed and the magnet made active, then the magnet will draw down the magnet end of the armature-lever and force upward the other end, lifting the latch L^5 , and thus release the hold that the latter has on the upper end of the latch L^4 and allow the force of the spring on the shipping-lever to throw down the latch L^3 and release the engagement of the latter and the catch C^2 of the shipping-lever, and thus throw off the belt.

The letter J indicates a standard upon which the latching mechanism, the bars B^2 B^3 , the magnet-coils, and the magnet armature and lever are supported.

The function of the inclosure E is to contain and keep free from floating dust and flocks the plate D, and to insure a perfect closing of the circuit by means of said plate.

As the plate D is constructed and arranged to open and close an electrical circuit in connection with the drop-lever A^2 and pivoted arm A' , operated by the yarn intact to keep the circuit open, and when broken to close the circuit, these parts perform a specific office, and this office would be the same whether applied to operate such a latching mechanism as I illustrate or some other; hence I do not limit my invention to these factors, as I construct and arrange them to their combination with the particular latching mechanism that I illustrate and describe.

As a latching mechanism provided with a magnet having an armature and armature-lever that is pivoted, and which lever when the magnet was excited would trip a latching mechanism and release the belt-shipper,

would perform this function, whether the circuit-closing means was that which I illustrate and describe or some other circuit-closing means, I do not limit my invention of these factors, as I arrange and combine them to their combination with the circuit-closing mechanism that I illustrate and describe.

The particular advantage arising from the use of the electrical stop-motion herein described is that it operates instantaneously with the breaking of the yarn and prevents very promptly the difficulty occasioned by it.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of the arm A' , the drop-lever A^2 , the wire-holders w^6 and w^7 , and the circuit-closing plate D, arranged substantially as described, and for the purpose specified.

2. The combination of the bracket M, formed with the inclosure E, the drop-lever A^2 , mounted on the bracket and provided with a tappet on its pivotal rod within the said inclosure, the hinged arm A' , constructed and arranged to engage with the lever A^2 , the wire-holders w^6 w^7 , and the plate D, all substantially as described.

3. The combination of the belt-shipping lever S, provided with a catch, C^2 , and spring I, the pivoted latch L^3 , formed to engage with the catch C^2 at its lower end, and formed with a slot, s^3 , in the upper end, the latch L^4 , having a pin, p^4 , to engage the slot in the latch L^3 , the latch L^5 , formed to engage with and hold the latch L^4 in vertical position, the pivoted armature A^4 , having a lever-arm, N^3 , the magnet C^4 C^5 , wires in connection with the said magnet, and a circuit-closing mechanism interposed in said wires and arranged to normally hold the circuit broken and to close the circuit when a break occurs in the yarn, substantially as and for the purpose specified.

4. The combination, with the spring-actuated belt-shipping lever, catch C^2 , and a latching mechanism, L^3 , L^4 , and L^5 , to hold said lever in position with the belt in place to turn the machine, of an electro-magnet provided with an armature having a lever-arm to engage the latch of the belt-shipping lever in connection with said magnet, and a circuit-closing mechanism interposed in the wires of the circuit and arranged to close said circuit when a break occurs in the yarn, all substantially as described, and for the purpose stated.

Signed at Troy, New York, this 3d day of January, 1885, and in presence of the witnesses whose names are hereto written.

EDWARD G. CONNER.

Witnesses:

STANLEY M. HOLDEN,
GEO. M. PAYFORD.