

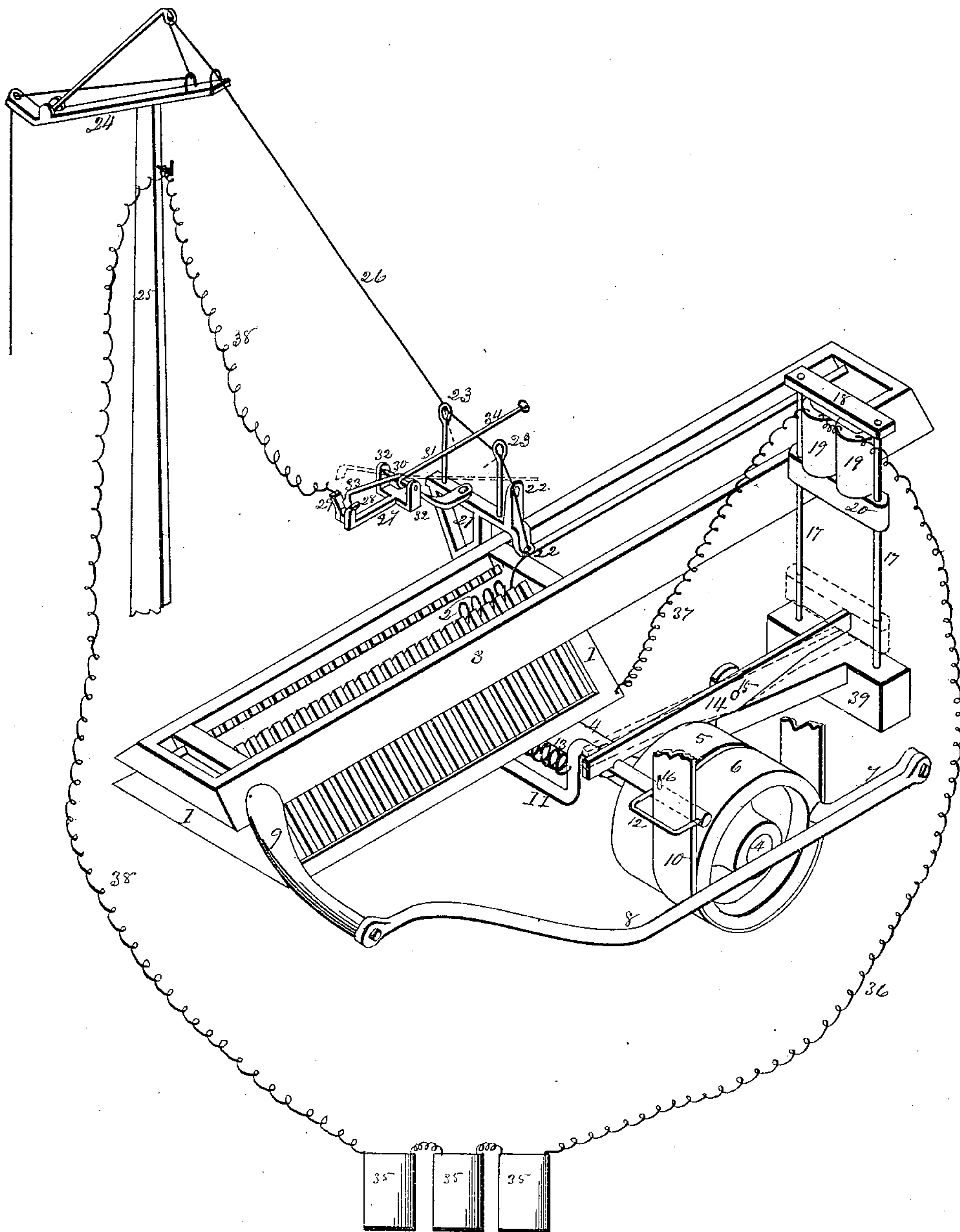
(No Model.)

W. TALCOTT, 2d.

ELECTRICAL STOP MOTION FOR KNITTING MACHINES.

No. 379,832.

Patented Mar. 20, 1888.



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ELECTRICAL STOP-MOTION FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 379,832, dated March 20, 1888.

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To all whom it may concern:

Be it known that I, WAIT TALCOTT, 2d, a citizen of the United States, residing in the city of Rockford, county of Winnebago, and State of Illinois, have invented a new and useful Improved Electrical Stop-Motion for Knitting-Machines, of which the following is a specification.

This invention relates to stop-motions for knitting-machines. Its object is to automatically stop the machine when the immediate supply of the yarn employed becomes exhausted, separated, or broken, or when its tension becomes relaxed.

To this end I have designed and constructed the stop mechanism represented in the accompanying drawing.

In the drawing I have represented my improvement in a single figure, which is a perspective view in connection with parts of a well-known form of straight-knitting machine, in which the needle-beds 1 are parallel and are upwardly inclined toward each other, and their upper inclined faces are provided with transverse guide-grooves, in which the latch-needles 2 are supported to move endwise in the process of knitting.

A needle-operating slide, 3, provided with cams to engage the bits or heels rising from the shanks of the needles, is supported to move endwise over the needle-beds in suitable guides, and in its endwise movements serves to project and retract the needles in their grooves.

A driving-shaft, 4, supported to revolve in suitable bearings on the machine-frame or on its supports, is provided with a loose pulley, 5, to revolve thereon, and a driving-pulley, 6, fixed on the shaft, to revolve therewith.

A crank-arm, 7, fixed to the outer face of the fixed driving-pulley, has a wrist-pin connection of its outer end with a pitman or connecting rod, 8, which is pivotally connected at its other end with an arm, 9, projecting laterally from the needle-operating slide, with which it is securely connected. By this arrangement it will be seen that motion from a prime mover, transmitted through the belt 10 to the driving-pulley of the machine, will impart a reciprocating movement to the needle-operating slide by means of its pitman-connection with the crank of the driving-pulley.

A belt-shifting bar, 11, is supported in guides on any suitable portion of the machine, or on its support, in a manner capable of an endwise-sliding movement.

A loop, 12, to embrace the belt 10, is fixed in the free end of the shifting-bar, and a shifting-spring, 13, connected at one end to the shifting-bar and at its other end to any suitable part of the machine or its support, operates to shift the belt from the driving-pulley onto the loose pulley when the shifting-bar is liberated. The shifting-bar is notched on its upper side to receive a detent to hold it against the action of the shifting-spring.

A trip-lever detent, 14, is pivotally supported at a point, 15, near the middle of its length, in such position relatively with the notch in the shifting-bar and in such a manner that one of its ends will drop into the notch formed in the shifting-bar when the belt is shifted onto the driving-pulley, and serves as a detent to hold the shifting-bar against the action of the shifting-spring.

A stud-pin stop, 16, (shown in dotted lines,) rises from the upper side of the shifting-bar in position to engage the outer face of the lever-detent and limit the inward endwise movement of the shifting-bar to place the belt on the loose pulley when the detent trip-lever is disengaged from the shifting-bar.

A base-support, 39, is placed and suitably supported in position under the free outer end of the detent trip-lever, and from its end portions on both sides of the detent trip-lever parallel guide-bars 17 rise in vertical position, and their upper ends are fixed in a cross-bar, 18. An electro-magnet, 19, is fixed to the under face of the cross-bar 18 between the vertical guide-bars 17. A cross-head armature, 20, is supported on the vertical guide-bars 19, to slide thereon freely and in such a manner that when liberated from the magnet it will drop on its guide-bars onto the free end of its detent trip-lever and disengage it from the belt-shifting bar, as shown in dotted lines, and permit the belt-shifting bar to move endwise by the action of the shifting-spring and shift the belt from the driving-pulley onto the loose pulley and stop the machine.

A yarn-carrier, 21, of bracket form, with guide-eyes 22 to receive the yarn, is centrally fixed to the needle-operating slide in position

thereon to deliver the yarn to the knitting-needles.

The yarn-carrier is provided with yarn-supporting eyes 23, rising from its base at proper intervals, and receive the yarn on its passage to the guide-eyes 22 of the carrier, which delivers it to the knitting-needles.

A tension mechanism, 24, substantially such as heretofore employed for like purposes, is mounted on a support, 25, rising from any suitable portion of the machine or from its support.

The yarn 26, taken from a bobbin or other suitable source of supply, is passed through the tension mechanism, thence through the eye-supports 23, and thence through the guide-eyes 22 to the knitting-needles. A circuit-breaker having a bracket-formed base, 27, fixed to the yarn-carrier, is provided at its free end with an uprising outwardly-inclined jaw, 28. A jaw, 29, substantially a duplicate of the jaw 28, has an insulated connection with the jaw 28 at its base, in a manner to form a V-shaped spread of their upper ends. A circuit-breaking lever consisting of a transverse shaft, 30, and a beam, 31, is pivotally supported in place by means of its transverse shaft, having its ends supported in ear-bearings 32, rising from the base of the breaker.

The position of the circuit-breaking lever relatively with the other parts is such that its end portion, 33, shall enter the V-formed spread of the jaws 28 and 29, and when in connection therewith will form an electrical connection between the insulated jaw 29 and the non-insulated jaw 28. The free end 34 of the lever-beam extends over the yarn or thread 26, between the yarn-supporting eyes 23, in such a manner that the tension of the yarn will support its free end and hold its opposite end 33 in contact with the spread jaws; and if at any time the immediate supply of yarn becomes exhausted, or from any cause the thread becomes broken or its tension relaxed, the free end of the lever will drop, and its opposite end will be disengaged from the spread jaws, as shown in the dotted lines.

A battery, 35, of any of the known varieties capable of use for the purpose, may be employed to energize the magnet, and such battery is connected to the magnet and to the machine by means of conducting-wires 36 and 37, and for this purpose insulated wires are preferred.

A conducting-wire, 38, preferably insulated, is employed to connect the battery to the insulated jaw 29 of the circuit-breaker.

From the foregoing it will be seen that when the parts are in the position represented in the solid lines the electric circuit will be closed and the armature will be held in contact with the magnet; but if from the breaking of the thread, as shown in the dotted lines, or if the immediate supply of yarn becomes exhausted, or its tension becomes relaxed, the circuit-closing lever will change to its dotted-line position, break the electric circuit, demagnetize the magnet, liberate the armature and permit it to drop onto the free end of the detent-lever, disengage its forward end from the belt-shifting bar, and permit the latter to shift the belt onto the loose pulley and stop the machine.

In this instance I have employed my improvements in connection with a straight-knitting machine, but do not wish to confine myself to this particular application, as it is capable of use in connection with perhaps most, if not all, varieties of knitting-machines employed in the manufacture of knit fabrics, or other machines employing thread or yarn in the production of fabrics.

I claim as my invention—

1. The combination of a needle-operating slide, a yarn-carrier mounted on the needle-operating slide, yarn-supports on the carrier, electric conductors on the carrier insulated from each other and connected with the opposite poles of a battery, and a circuit-breaking lever held in position to close the circuit between the said conductors by the yarn under tension, substantially as set forth.

2. The combination of the knitting mechanism, means for leading the yarn or thread to the machine under tension, a belt-shifter, a spring to actuate the shifter, a tilting stop to lock the shifter against the tension of the spring, an electro-magnet energized so long as the yarn is fed under tension, the armature of the magnet being held by the energized magnet above the operating-arm of the tilting stop, and a lever circuit-breaker held in position to close the circuit by the yarn under tension, substantially as set forth.

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