

1,064,868.

Fig. 1

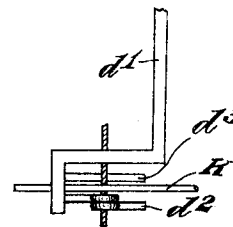
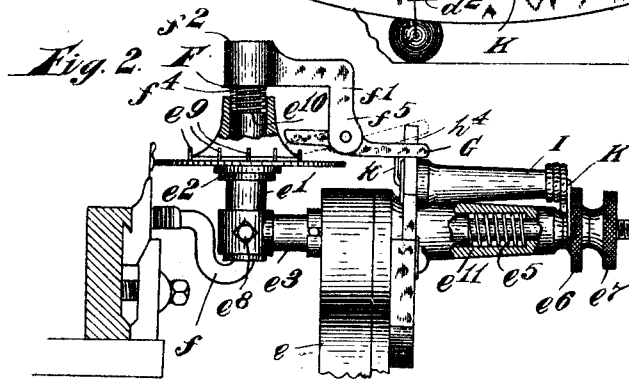
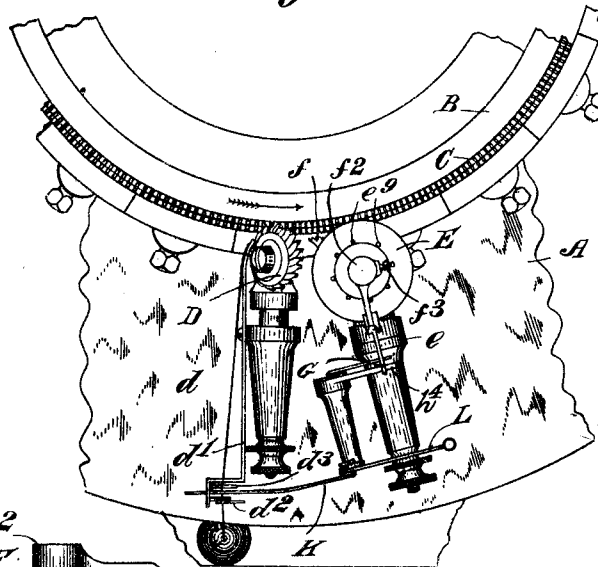


Fig. 5.

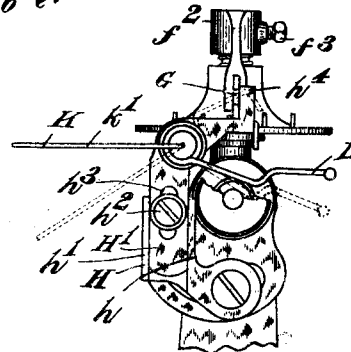
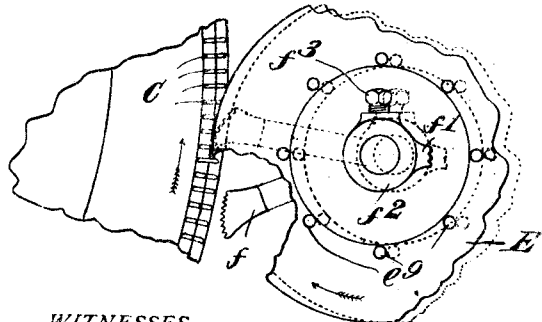


Fig. 4.

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Fig. 3.

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QUARTER-SAVER FOR CIRCULAR SPRING-NEEDLE KNITTING-MACHINES.

1,064,868.

Specification of Letters Patent.

Patented June 17, 1913.

Application filed December 11, 1912. Serial No. 736,060.

To all whom it may concern:

Be it known that I, DANIEL F. SULLIVAN, a citizen of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Quarter-Savers for Circular Spring-Needle Knitting-Machines, of which the following is a specification.

This invention relates to quarter savers or devices which in a circular spring needle knitting-machine prevents the fabric from "running off" when the yarn breaks or becomes exhausted.

When a yarn in a multiple feed machine of the kind referred to breaks and the machine continues to run, the cloth will run off from the needles, and the yarns of the other feeds will continue to enter the needles and be crowded under the beards of the needles, the wheels breaking the beards and breaking and bending the needles and doing considerable damage. But if the presser-wheel of the feed to which the broken yarn belongs is immediately drawn out of engagement with the needles, the machine will continue to knit the fabric properly but with a production decreased by the ratio which one disabled feed bears to the whole number of feeds in the machine.

The object of this invention is to throw the presser out of engagement with the needles instantly upon the breaking of the yarn.

In the accompanying drawing, Figure 1 is a plan of so much of a circular spring-needle knitting-machine, with my improvement, as is necessary to the understanding of said improvement; Fig. 2, a side elevation of the same; Fig. 3, a plan of a part of the needle-cylinder, a part of the presser-disengaging lever; Fig. 4, an outer end elevation of the device; Fig. 5, an enlarged plan of the yarn-supports and the outer end of the drop-wire.

The bed A or table; the cylinder B, rotary about a vertical axis; spring-needles C; stitch-wheel D; its stand *d*; the yarn guide *d'*; the presser-wheel E and its stand *e*;—these parts are all of the usual construction and operation except as hereinafter stated.

The presser-wheel turns upon a vertical stud *e'* having an annular shoulder *e''* and secured to a horizontal spindle *e'''* which slides in a stand *e*, and is pressed by a

spring *e⁵* radially toward the cylinder B and is limited in its movement toward said cylinder by a nut *e⁶* and check nut *e⁷*, turning on the outer end of said spindle in the usual manner. The height of the presser-wheel is varied by raising the stud *e'* in the spindle to accommodate the different lengths of needles and said stud when adjusted is held by a set-screw *e⁸* (Fig. 4) which turns in the spindle against said stud, as usual.

I provide the presser-wheel with one or more rigid pins *e⁹* or projections which extend upward from the top thereof, and I make a central opening *e¹⁰* in the stud *e'*. A vertical rock-shaft F passes up through this opening and is provided at its lower end with an arm *f*, the outer end of which is arranged and adapted to be swung against the needle-cylinder and to be carried by friction therewith until said arm *f* reaches and passes slightly a position radial to said cylinder crowding the spindle outward and moving the presser-wheel out of engagement with the needles, so that the beards of the needles will remain open and the fabric cannot be raised off from the needles. Another arm *f'* is adjustably secured to the upper end of the shaft F, said arm *f'* being represented as having a hub *f²* which surrounds the stud and is retained in place by a set-screw *f³* and prevents the shaft F from dropping out of the stud *e'*.

A spiral spring *f⁴* surrounds the shaft F above the stud *e'* and prevents the hub *f²* from resting upon and being turned by friction on the top of the presser-wheel and holds the lower arm *f* against the lower end of said stud *e'* with sufficient friction to prevent said shaft from being jarred or accidentally turned.

The outer end of the arm *f'* is represented as bent downward at *f⁵*, and as having journaled in its lower free end a latch-lever G arranged about radially to the presser-wheel, and normally out of the path of the pins *e⁹*, the outer arm of said latch-lever being heavier than the inner arm thereof for this purpose. The arm and latch-lever are arranged at such an angle to each other that when the latch-lever is out of the path of the pins *e⁹*, the outer end of the arm is almost in contact with the needle-cylinder.

A bracket is formed in two parts H H', one of which H is secured to the presser-

wheel stand *c* and is provided with one or more vertical guides, *h h* by or between which the shank *h'* of the part *H'* is guided and held by a cap-screw *h²* which passes through a vertical slot *h³* in the part *H* which allows the upper part of said brackets to be adjusted vertically when necessary.

The upper part *H'* of the bracket has an upward projection *h⁴* which limits the turning of the rock-shaft *F* in one direction and the distance to which the lower arm *f* of said shaft may be swung away from the cylinder after the relative positions of the arms of said shaft have been properly adjusted and set by the screw *f⁵*.

The upper part *H'* of said stand also supports or, preferably, has formed integrally therewith a tubular bearing *I* through which extends the body or shaft of a drop-wire *K*.

The drop-wire *K* has a straight middle part within the sleeve or bearing *I* and two oppositely extending arms *k k'*, one of which reaches past the stop *h⁴* under the outer arm of the latch-lever *G* and the other *k'* of which is longer and heavy enough when unsupported to rock the drop-wire and raise the arm *k* and lift the outer arm of the latch-lever *G*, causing the inner arm of said latch to enter the path of the pins *e^o*.

When the latch *G* is engaged by one of the pins *e^o* it is carried along with said presser turning the shaft *F* and causing the arm *f* to engage the cylinder, and the presser-wheel to be crowded away from the needles.

Ordinarily the drop-wire proper or arm *k'* is supported by the yarn in a nearly horizontal position and the arm *k* is held out of contact with the latch.

The unbroken yarn is supported on one side of the drop-wire proper by a loop *d²*, as of wire, and on the other by a straight wire *d³*, these supports being rigidly secured in the yarn-guide.

When the presser-wheel is moved away from the cylinder a space is opened between the nut *e^o* and the end of the sleeve-bearing *e¹¹* of the spindle and I provide a retainer *L* which drops or springs into this space and prevents the presser-wheel from being

thrown by the spring *e⁵* into engagement with the needles, this retainer being represented as a spring-arm secured to the bearing *I* and reaching over the groove between the reduced contiguous ends of the bearing *e¹¹* and nut *e^o*.

I claim as my invention:—

1. The combination with the cylinder of a circular spring-needle knitting-machine, its needles, a presser-wheel, normally in engagement with said needle, a yielding support for said presser-wheel, a drop-wire normally sustained by an unbroken yarn, and a rock-shaft journaled in said movable support and having arms, means for engaging said presser-wheel and one of said arms with each other, the other of said arms being adapted to engage said cylinder and to crowd said presser-wheel away from said needles.

2. The combination of the needle-cylinder, needles, a yielding spindle, a vertical hollow stand supported thereby, a presser-wheel turning thereon and having pins, a rock-shaft journaled in said hollow spindle and having arms above and below said presser-wheel, the upper of said arms carrying a latch normally out of the path of said pins, a drop-wire sustained by an unbroken yarn, and moving said latch into the path of said pins when said yarn breaks or is exhausted, to rock said shaft and to bring the lower arm of said rock-shaft into engagement with said cylinder.

3. The combination of a spindle, a hollow stud, a rock-shaft journaled therein and having an arm at each end thereof, a presser-wheel revolving on said stud, and a spring surrounding said shaft and compressed between the top of said stud and the upper arm of said shaft, to create a friction on said shaft and prevent the accidental turning of the same.

In witness whereof, I have affixed my signature in presence of two witnesses.

DANIEL F. SULLIVAN.

Witnesses:

ALBERT M. MOORE,
EARL A. THISSELL.