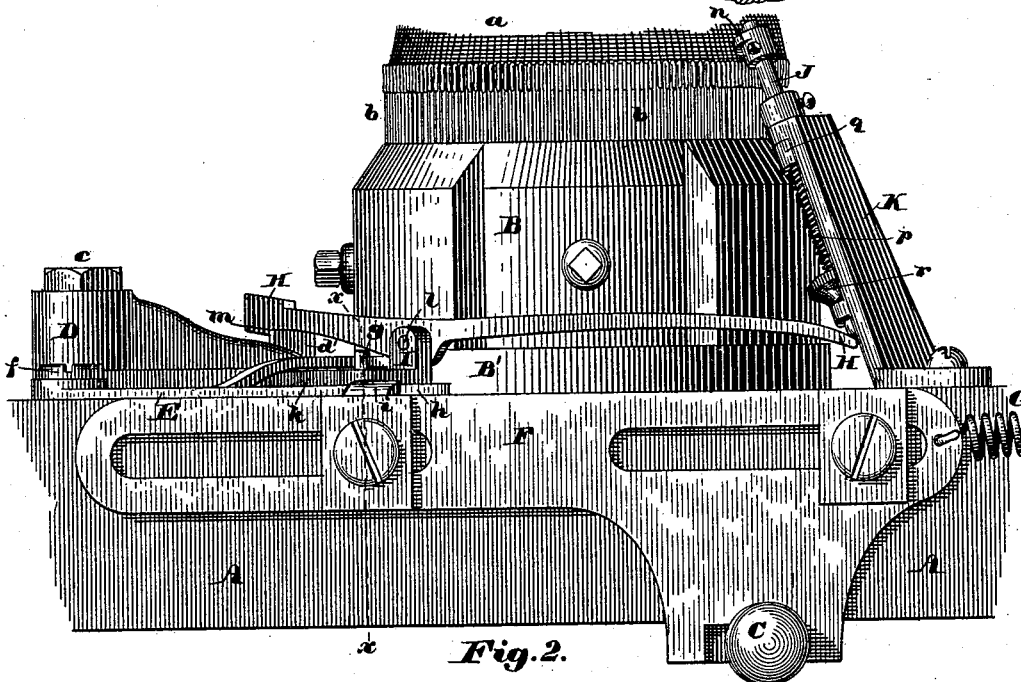
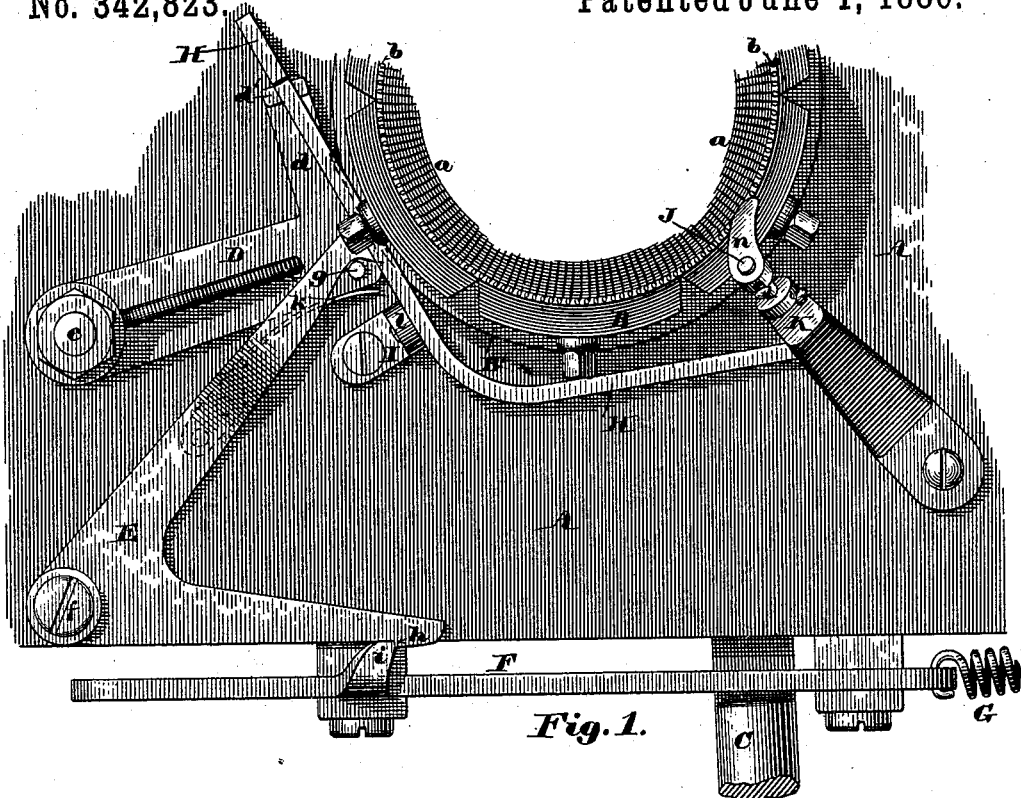


J. BYFIELD.

STOP MOTION FOR KNITTING MACHINES.

No. 342,823.

Patented June 1, 1886.



Witnesses:
Frank O. Gray
Walter E. Lombard.

Inventor:
John Byfield,
by N. C. Lombard
Attorney.

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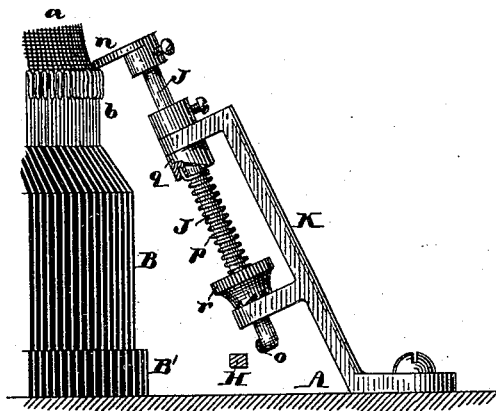


Fig. 5.

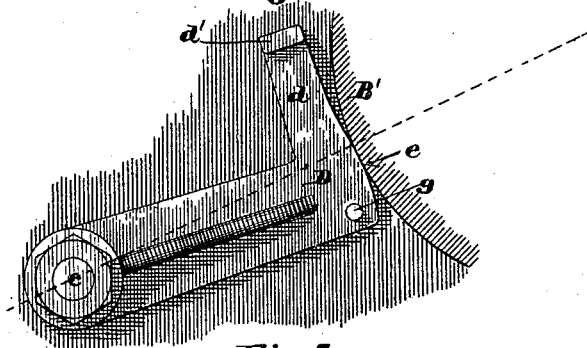


Fig. 5.

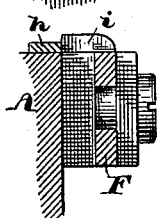


Fig. 6.

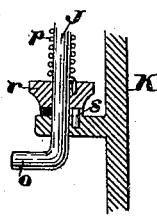


Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN BYFIELD, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO THE BYFIELD MANUFACTURING COMPANY, OF SAME PLACE.

STOP-MOTION FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 342,823, dated June 1, 1886.

Application filed August 24, 1885. Serial No. 175,199. (No model.)

To all whom it may concern:

Be it known that I, JOHN BYFIELD, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Stop-Motions for Knitting-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to stop-motions for circular-knitting machines, and to that particular class of stop-motions in which the action of the stop mechanism is controlled by the knit fabric, and is in part an adaptation of certain devices shown and described in Letters Patent No. 328,876, granted to me October 20, 1885, for a stop-motion controlled by the tension of the yarn to a stop-motion controlled by the knit fabric; and it consists in certain novel constructions, arrangements, and combinations of parts, which will be readily understood by reference to the description of the drawings, and to the claims to be hereinafter given.

Figure 1 of the drawings is a plan of so much of a circular-knitting machine as is necessary to illustrate my invention, and showing a fragment of knit fabric attached to the needles. Fig. 2 is a front elevation of the same. Fig. 3 is an elevation of a portion of the needle-head and of the device for operating the stop mechanism when a hole is formed in the fabric, the locking-lever H being shown in section. Fig. 4 is a vertical section through a portion of the stand for supporting the inclined shaft, carrying at its upper end the fabric-pressing finger. Fig. 5 is a plan of the brake-pawl, and showing its relation to the periphery of the base-flange on the needle-head when engaging therewith to arrest the revolution of said needle-head; and Fig. 6 is a transverse vertical section through the shipper-operated locking latch-bar and a portion of the bed of the machine and the shipper-locking lever, the cutting plane being on line *x x* in Fig. 2.

In the drawings, A is the bed of the machine, only a small portion of which is shown.

B is the needle-head, provided with the base flange or collar B', and carrying the series of barbed needles *b*; and *a* represents a fragment of a knit fabric attached to said needles, the stitch-

forming mechanism and yarn-guides being omitted, as being unnecessary in the drawings, as they form no part of my present invention. The needle-head B is operated in a well-known manner by a suitable shaft and gearing located below the bed A, said gearing being arranged to be shipped into or out of gear by the lever C, substantially as shown and described in my before-cited patent, said gearing and shaft and the connection of the lever C not being shown in the drawings, as they are old and form no part of my present invention.

D is the brake-pawl, pivoted to the bed A at *c*, and provided with the rearwardly-projecting arm *d*, from the rear end of which rises the ear *d'*, said brake-pawl D having its inner end so shaped and being so arranged relative to the outer surface of the flange or collar B' of the needle-head B that the two surfaces of the pawl and collar shall impinge upon each at the point *e* in front of a radial line drawn through the axis of said needle-head and the pivotal axis of the pawl D, as shown in Fig. 5.

E is an elbow-lever, pivoted at *f* to the bed A with its front arm about parallel with the front edge of said bed, and its rear arm resting at its end upon the upper surface of the pawl D in the rear of the pin *g*, set in the upper surface of said pawl, and which engages with said rear arm to move the lever E about its pivotal axis to disengage the shoulder *h*, formed upon the front edge of its front arm near its end, from the nose *i* of the latch-bar F when the pawl D is thrown into engagement with the collar B' of the needle-head B, thus releasing said latch-bar and permitting the reaction of the spring G to move said bar F to the right, and thus cause the shipper-lever C to unship the gears, substantially as described in my patent before cited. A spring, *k*, is firmly secured at one end to the under side of the rear arm of the elbow-lever E with its free end arranged to press against the front edge of the pawl D, as shown in Fig. 1, the action of which is to tend to force said levers apart—*i. e.*, to press the pawl-lever toward the rear and the elbow-lever toward the front of the machine—which tendency is controlled by the pin *g* coming in contact with the curved edge of the rear arm of the elbow-lever E.

H is a lever, pivoted at *l* to the stand I, screwed to the top of the bed, as shown, the rear arm of said lever H extending backward over the pawl D and beyond the ear *d'*, with which the shoulder *m*, formed upon its under side, engages when the free end of the pawl D is moved away from engagement with the collar B', as shown in Fig. 1, the rear end of said rear arm of the lever H being weighted so that it falls by the force of gravity into engagement with said ear when said ear *d'* is moved in front of said shoulder *m*. The other arm of the lever H is curved partially around the needle-head, and its end is curved downward slightly, as shown in Fig. 2.

J is an inclined shaft, mounted in bearings in the stand K, and carrying at its upper end the curved finger *n*, and provided at its lower end with the arm *o*, which may be formed in one piece with said shaft or made separately therefrom and secured thereto in any well-known manner. A spiral spring, *p*, is coiled around the shaft J, and has its upper end secured to the collar *q*, firmly secured to said shaft, so as to revolve therewith, and its lower end attached to the milled collar *r*, mounted loosely upon said shaft, and provided with ratchet-teeth upon its lower end, which engage with the pin *s*, set in the upper side of the lower bearing of the stand K, as shown in Fig. 4. The stand K is so located upon the bed that the curved rear edge of the finger *n* will rest against the knit fabric *a* just above the upper ends of the needles *b*, and so that the end of the arm *o* when moved about the axis of the shaft J will impinge upon the upper curved surface of the front arm of the lever H and depress it, thereby raising the end of the rear arm of said lever and releasing the pawl D, when the tension of the spring *k* will cause said pawl to be moved into contact with the periphery of the collar B', and the pin *g* into contact with the rear arm of the elbow-lever E, when any further movement of said pawl, caused by a slight further movement of the needle-head, will cause the latch-bar F to be released from engagement with the front arm of the elbow lever E, and permit the spring G to retract and move the shipper-lever to the right, and disengage the driving-gear from the gear on the base of the needle-head. By turning the collar *r* upon the shaft J so as to strain the spring *p* the finger *n* may be made to press with greater or less force upon the fabric, and if it happens that a break occurs in the fabric by the dropping or breaking of a stitch, so as to form a hole therein, when said hole reaches said finger the torsion of the spring *p* will cause the shaft J to move about its axis a sufficient distance to depress the front end of the lever H, as above described.

The operation of my invention will be readily understood from the foregoing without further description here.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of a rotary needle cylinder or head, a friction-brake lever or pawl mounted upon an axis outside of said cylinder in a position to operate upon the periphery of the needle head, a spring for causing said pawl to engage with the needle-head, a lever for locking and holding said pawl in a retracted position, a shaft provided at one end with a radial arm to act upon and vibrate said locking-lever, a spring arranged to exert a torsional action upon said shaft and tend to rotate it about its axis, and an arm or finger mounted upon said shaft and arranged to press upon the knit fabric just above the points of the needles and hold said shaft from rotating so long as the fabric is intact and permit such rotation when a break occurs in the fabric, substantially as described.

2. The combination of a rotary needle cylinder or head, a friction-pawl mounted upon an axis outside of said cylinder in a position to operate upon the periphery of said needle-head, a spring for causing said pawl to engage with the needle-head, a lever for locking and holding said pawl in a retracted position, the shaft J, the spring *p*, made fast at one end to the shaft J and at the other connected to a stationary part of the machine, and the arms or fingers *n* and *o*, all arranged and adapted to operate substantially as and for the purposes described.

3. The combination of a rotary needle cylinder or head, a friction-pawl mounted upon an axis outside of said head, a spring for causing said pawl to engage with the periphery of said head, a lever for locking said pawl in a retracted position, the stand K, the shaft J, the arms *n* and *o*, the collar *q*, fixed upon said shaft J, the collar *r*, mounted loosely upon said shaft and provided with ratchet-teeth upon its lower end, the pin *s*, set in the stand K, and the spring *p*, having one end secured to the collar *q* and the other end connected to the collar *r*, all arranged and adapted to operate substantially as and for the purposes described.

4. The combination of the needle-head B, the friction-pawl D, provided with the pin *g*, the elbow-lever E, provided with the shoulder *h*, the latch-bar F, provided with the nose *i*, the shipper-lever C, the springs *k* and G, the locking-lever H, the stand K, the shaft J, the ratcheted collar *r*, the pin *s*, the spring *p*, and the arms or fingers *n* and *o*, all arranged and adapted to operate substantially as and for the purposes described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 20th day of August, A. D. 1885.

JOHN BYFIELD.

Witnesses:

WALTER E. LOMBARD,
FRANK E. BRAY.