

(No Model.)

C. M. MUSGROVE & A. SMITH.
KNITTING MACHINE.

No. 545,809.

Patented Sept. 3, 1895.

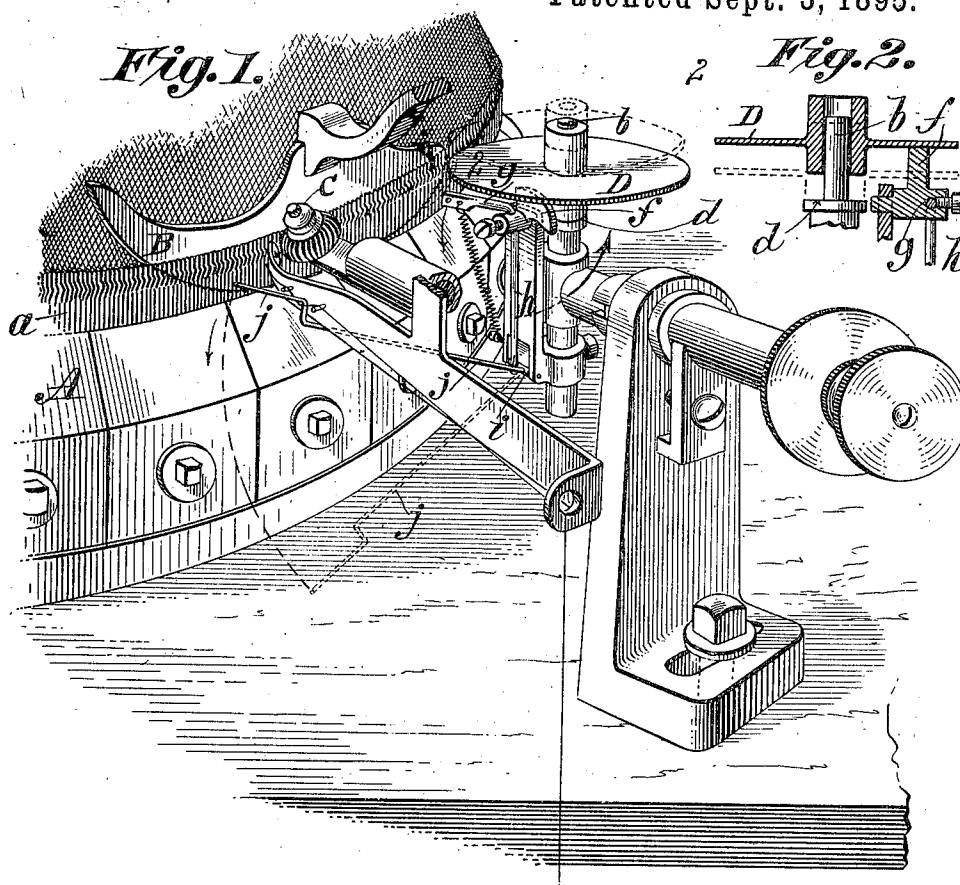


Fig. 3.

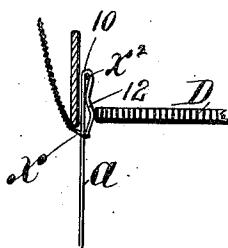
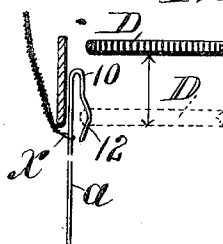


Fig. 4.



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UNITED STATES PATENT OFFICE.

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KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 545,809, dated September 3, 1895.

Application filed July 23, 1894. Serial No. 518,295. (No model.)

To all whom it may concern:

Be it known that we, CHARLES M. MUSGROVE and AUGUSTINE SMITH, citizens of the United States of America, residing at Pittsfield, in the county of Berkshire and State of Massachusetts, have invented new and useful Improvements in Knitting-Machines, of which the following is a specification.

This invention for the improvement of circular-knitting machines particularly relates to mechanism which is automatically operative on the breaking of the yarn, which prevents further looping or knitting, to insure, even while the cylinder and work thereon continue to revolve, a discontinuance of the closing of the beards of the needles as they come adjacent the presser-wheel, all so that the lowermost loops of the tubular fabric already formed and revolving with the cylinder may not be cast off from the needles, but so that the work, in so far as it has been perfectly completed, remains in a condition to have the broken yarn again easily connected, so that the knitting may then be continued without any necessity of resetting or having to again loop in the knit fabric relative to the needles, or of otherwise having to perform any slow, difficult, or bothersome operation.

The invention consists in the combination, with a presser-wheel mounted on a vertical axis which normally occupies its beard-closing position in relation to the needles as they in their revolution successively come subject to the pressure of said wheel, and which presser-wheel is mounted for a rising movement on the line of its axis, of a device which comprises a spring, or like actuating agency for elevating the wheel above its beard-closing relation to the needles, and a trigger-like part which restrains said wheel-shifting device and which is engaged and supported by the yarn so long as the latter is continuous, and which, on the breaking of the yarn which supports it, effects the release of the presser-wheel-elevating device. Said arm and trigger connections constitute the detent, as will be understood.

The invention also consists in particular constructions and combinations of parts, all substantially as will hereinafter fully appear and be set forth in the claims.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a perspective view of so much of a circular-knitting machine with the present improvements operatively applied thereon as will enable a person skilled in the art to readily comprehend the present invention. Fig. 2 is a vertical section through the presser-wheel, showing the device which lifts the same above its beard-closing relation. Fig. 3 is a view which shows the presser-wheel in its beard-closing relation to the needle, while Fig. 4 is a view which shows the said wheel lifted from its beard-closing relation.

In the drawings, A represents the rotary needle-cylinder with the series of knitting-needles *a*, each formed, as usual, with the hook-bend 10 and beard 12, as a downward continuation of the bend, which beard has a spring reaction outwardly, as usual.

The "push-down" B and stitch-wheel C are arranged as usual.

D represents the presser-wheel mounted on the fixed support at one side of the needle-cylinder and rotating in a substantially horizontal plane with its edge in a compressing impingement against the beards of the knitting-needles. The presser-wheel rotates on the vertical stud *b*, on which the hub of the said wheel is loosely fitted, so that in addition to its rotary movement the wheel may also have an axial movement to rise from its seat upon the shoulder *d* at the base of said stud. On the support for the shiftable presser-wheel, and under said wheel, is a pivoted cam-lever *f*, having the arm *g* to which the actuating-spring is applied, and having the arm *h*, which is to be engaged by the pivotally-mounted trigger *j*. Said cam-lever, when swung on its pivot by the force of its spring, exerts the elevating action upon the presser-wheel. Normally the cam-lever is so held against the reaction of its spring that the presser-wheel may remain down, and when so in lowered position the arm is restrained by the trigger, which may consist of the wire mounted on and extended from the rocking pivot *i*, and which extends from such place of engagement up to proximity to the yarn near the needle-cylinder, which yarn, so long as it is unsevered, has a supporting and free

running engagement with and under said trigger. Now, plainly, so long as the knitting-machine runs under proper conditions with the yarn continuous, the operation of all of the knitting mechanism, inclusive of the presser-wheel, is as usual, the presser-wheel causing, as the needle-beards are successively brought against it, a compression of the beards, as seen in Fig. 3, whereupon the loop x , already formed at the bottom of the work and corresponding to a given needle, may be drawn up over and off from the top of the needle, forming a new loop by the yarn (seen at x^3 in Fig. 3) in the hook-bend of the needle. Now, in the event of the breaking of the yarn (whereupon there can be no new loop formed in case the last loop at the bottom of the work were upwardly drawn) the novel mechanism operates to prevent the drawing off of the lower loops; successively, from the needles thus: the severing of the yarn abolishes the support for the wire trigger j , whereupon the latter swings down by its gravity, disengaging the arm h , which permits the cam-lever to forcibly swing by reason of the reaction of its spring, the cam exerting the elevating impingement upon the presser-wheel. The wheel being raised free and clear above the circular path of the bearded needles leaves the beards of the needles open, (see Fig. 4,) whereupon, as plain, the loops at the bottom of the already knit work will not on being upwardly drawn be disengaged from the needles. This mechanism has been found unusually advantageous, in that it operates with extreme quickness and positiveness and with entire efficiency.

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

1. In a knitting machine, the rotary needle cylinder carrying hooked needles, the presser

wheel mounted on a fixed vertical axis at one side of the needle cylinder and rotating with its edge in proximity to the beards of the needles, a spring actuated cam lever mounted on a support with its cam face in contact with the lower face of the presser wheel, said lever having an arm projecting therefrom, a wire trigger engaging said arm and resting on the yarn, whereby the breaking of the yarn effects the release of the pressure wheel elevating device, all combined substantially as described.

2. In a circular knitting machine, a carrier and bearded needles, a fixed vertical support near said carrier, the presser wheel on said support having its edge in proximity to the needles, a three-armed lever supported on a pivot near said wheel, one of the arms being a cam and having a bearing against the under surface of the presser wheel, the second arm having a spring connected thereto and tending to rock the lever on its pivot, and the third arm in engagement with the trigger, said trigger bearing on the unbroken yarn and dropping on the breakage of the yarn, whereby the three-armed lever is swung and the presser wheel raised on its axis, all combined substantially as described.

3. In a knitting machine, the cylinder and needles, the vertically movable presser wheel, a cam mounted under said wheel and bearing thereon, a spring for actuating said cam to lift the presser wheel, and a detent acting normally to restrain the cam movement, said detent controlled by the unbroken yarn, all combined and relatively arranged substantially as described.

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