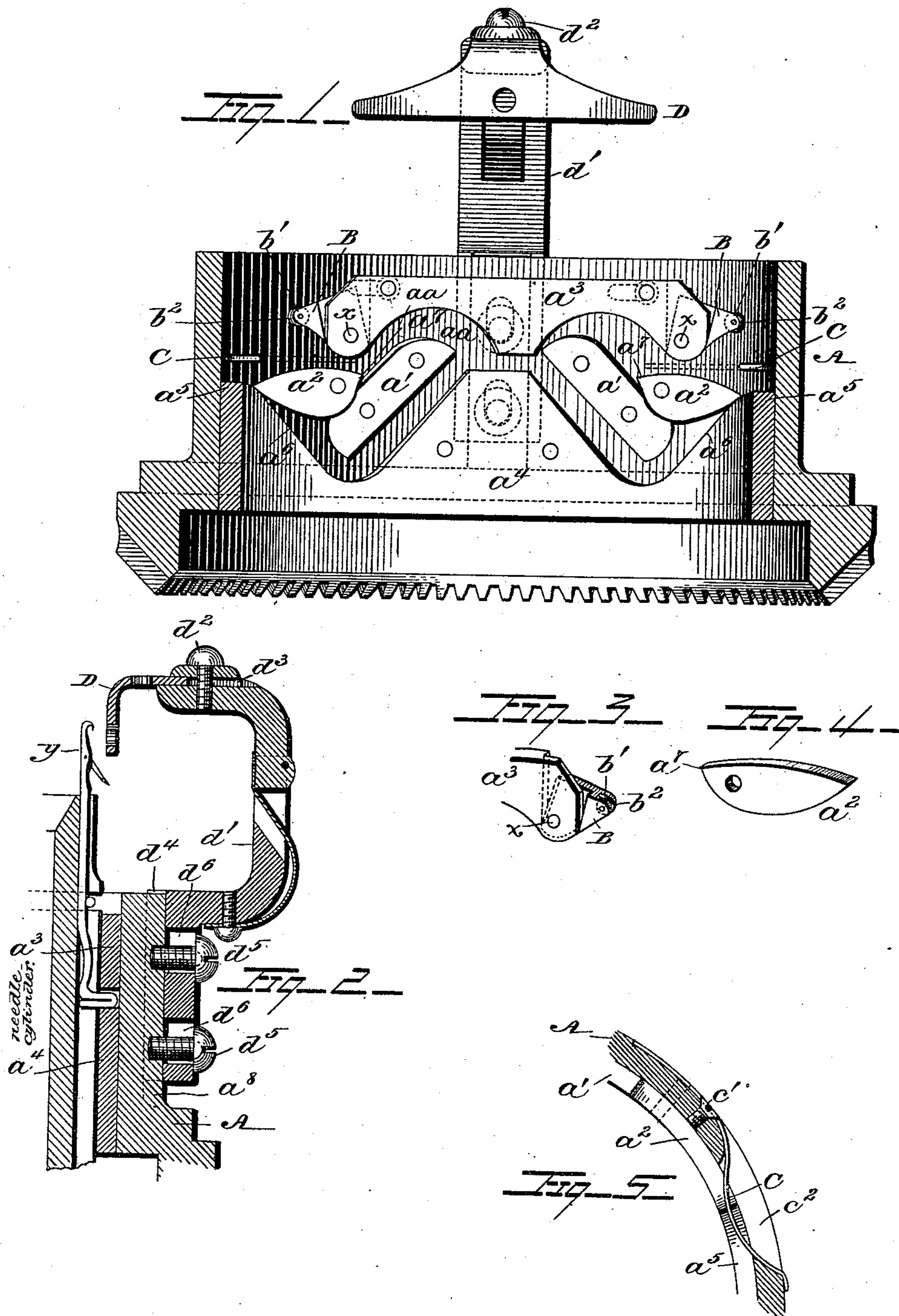


(No Model.)

H. BRINTON & B. M. DENNEY.  
CIRCULAR KNITTING MACHINE.

No. 426,760.

Patented Apr. 29, 1890.



WITNESSES

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# UNITED STATES PATENT OFFICE.

HENRY BRINTON, OF PHILADELPHIA, PENNSYLVANIA, AND BARCLAY M. DENNEY, OF CAMDEN, NEW JERSEY.

## CIRCULAR-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 426,760, dated April 29, 1890.

Application filed December 17, 1888. Serial No. 294,025. (No model.)

*To all whom it may concern:*

Be it known that we, HENRY BRINTON, of the city and county of Philadelphia, and State of Pennsylvania, and BARCLAY M. DENNEY, of the city and county of Camden, and State of New Jersey, both citizens of the United States, have invented certain new and useful Improvements in Circular-Knitting Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, of which—

Figure 1 is a vertical section of a knitting-machine cam-cylinder embodying our invention. Fig. 2 is a like section through the yarn-guide and adjacent sides of the cam and needle cylinders, showing a needle in place. Figs. 3 and 4 are views, respectively, of the guard and switch cams detached. Fig. 5 is a horizontal section through a part of the cam-cylinder, showing the jump-check and adjuncts.

This invention relates to the well-known class of circular-knitting machines of which the "Branson" is a type.

Our object, more particularly, is to improve the construction of the needle-actuating cam-cylinder in such manner that certain defects in the operation of this class of machines will be obviated and better results attained thereby, as hereinafter explained.

To this end our invention consists in a novel construction of the guard-cam and of the check-jump, as will duly appear.

Referring to the annexed drawings, A represents the rotatable cam-cylinder of a knitting-machine, said cylinder containing the stitch-cams  $a'$ , the switch-cams or tumblers  $a^2$ , the upper cam  $a^3$ , and the lower cam  $a^4$ . Pivoted at  $x$  to each end of the cam  $a^3$  is a triangular guard-cam B, whose free end or nose  $b'$  is slightly above the plane of the pivotal point  $x$ , so that it (said nose) will drop by gravity, and thus normally assume its down or active position. The function of this cam B is as follows: As the cam-cylinder rotates, if the heel of a needle happen, by accident or otherwise, to be above the mouth of the cam-groove  $a$ , it (said heel) will impinge against the nose of cam B, and the latter, yielding or ris-

ing, will guide the heel of the needle into the cam-groove, thereby preventing the end of the upper cam  $a^3$  from striking against the needle, and consequently breaking or otherwise damaging the same or the needle-cylinder, or both. Should the heel of the needle be above the nose of cam B, the inclined upper face of the latter will deflect the needle above the end of and upon the cam  $a^3$  without in any wise damaging the needle or the machine, a misstitch upon the article being knit merely resulting.

On the nose of the cam B we mount a small roller  $b^2$ , which renders the cam more effective in operation, obviating the otherwise attendant liability of the joint in the needle-heel being caught on and jammed against the nose of the cam. This roller we consider a needed and valuable addition to either pivotal or sliding guard-cams, and we therefore do not restrict ourselves to its use in connection with a guard-cam specifically constructed as herein shown and described.

The upward and downward movements of cam B are limited by its corners impinging against the ends or edges of the offset in which the cam is pivoted.

Another feature of our invention relates to a device for preventing the needles from being thrown above the needle-rest  $a^5$  from the lower cam  $a^4$  upon the completion of the stitch. This device consists merely of a piece of spring-wire C, screwed or otherwise secured at one of its ends to the exterior of the cam-cylinder A at a point  $c'$  near one end of a horizontal slot or opening  $c^2$  in the side of said cylinder just above the summit of the elevating-incline  $a^6$  of cam  $a^4$  and bent so as to project into and beyond the slot, the free end of the wire extending outward, so as to bear against the opposite end of said slot, and thereby limit the inward movement of the spring. As the needles are forced up by this incline, their heels strike the projecting portion of the wire, and the needles are thereby checked in their upward movement. The wire, being elastic, will readily yield if it shall happen to strike the heel of a raised needle during the revolution of the cam-cylinder in



the reverse direction while knitting the heel or toe of a stocking, &c. A similar check device operating in the same manner is thus disposed with reference to each side of the

5 cam  $a^4$ .

$a^2$  represents the vibrating switch-cam or tumbler, which automatically closes the mouth of the cam-groove on the escape of the needles therefrom upon the completion of the stitch, 10 in order to prevent the needles from passing back again into the cam-groove when the movement of the cam-cylinder is reversed. This tumbler has a rear projection  $a^1$ , whose function is to limit the upward movement of 15 the tumbler by impinging against the side of the stitch-cam  $a'$ , so as to obviate all danger of the tumbler being thrown or raised so high as to be unable to return to its closing position.

20 The tumbler on each side of cam  $a^4$  is identical in construction and operation with the tumbler just described.

The yarn-guide is made vertically and horizontally adjustable in the following manner, 25 in order that it may be adapted to needles  $y$ , Fig. 2, of various sizes, or for other purposes, as occasion may require:

D represents the yarn-guide, which is secured to the supporting-post  $d'$  by means of 30 a screw  $d^2$ , that passes through a slot  $d^3$  in the horizontal arm of the guide, thus rendering the latter adjustable horizontally. This post  $d'$  is provided with a central longitudinal groove or channel  $d^4$  on its inner side, into 35 which projects a vertical rib  $a^8$  on the side of the cam-cylinder, as seen more clearly in Fig. 2, thus preventing lateral displacement of said post. The latter is held in place vertically by means of screws  $d^5$ , which pass 40 through slots  $d^6$  in said post, thus rendering the same readily adjustable vertically.

The construction of the yarn-guide just described is not claimed in this application; but forms the subject of a divisional appli- 45 cation, filed October 17, 1889, Serial No. 327,302.

Having thus described our invention, we

claim as new and wish to secure by Letters Patent—

1. In a knitting-machine of the class recited, the combination, with the cam-cylinder, 50 of the guard-cam pivoted at or near one of its corners to the end of the upper cam, so that the forward corner or nose of said guard-cam will drop by gravity to the normal or active position, substantially as described. 55

2. In a knitting-machine of the class recited, the combination, with the cam-cylinder, of the guard-cam disposed at the end of the upper cam, so that the nose or forward corner of the guard-cam will be presented to the 60 path of movement of the needles, together with the roller on the nose of said guard-cam, substantially as described.

3. In a knitting-machine of the class recited, the combination, with the cam-cylinder, 65 of the guard-cam pivoted to the end of the upper cam, so that the nose or forward corner of the guard-cam will be presented to the path of movement of the needles, together with the roller on the nose of said guard-cam, 70 substantially as described.

4. In a knitting-machine, the combination, with the cam-cylinder having a horizontal slot therein, just above the summit of the elevating-incline of the lower cam, of the 75 jump-check consisting of a single piece of spring-wire secured at one of its ends to the exterior of said cylinder at a point near to one end of the slot therein and bent so as to project into and beyond the said slot, the free 80 end of the wire extending outward, so as to bear against the opposite end of the slot, and thereby limit the inward movement of the spring, substantially as described.

In testimony whereof we have hereunto 85 affixed our signatures this 4th day of December, A. D. 1888.

HENRY BRINTON.

BARCLAY M. DENNEY.

Witnesses:

JOHN NOLAN,

EDWARD I. TOOLE.