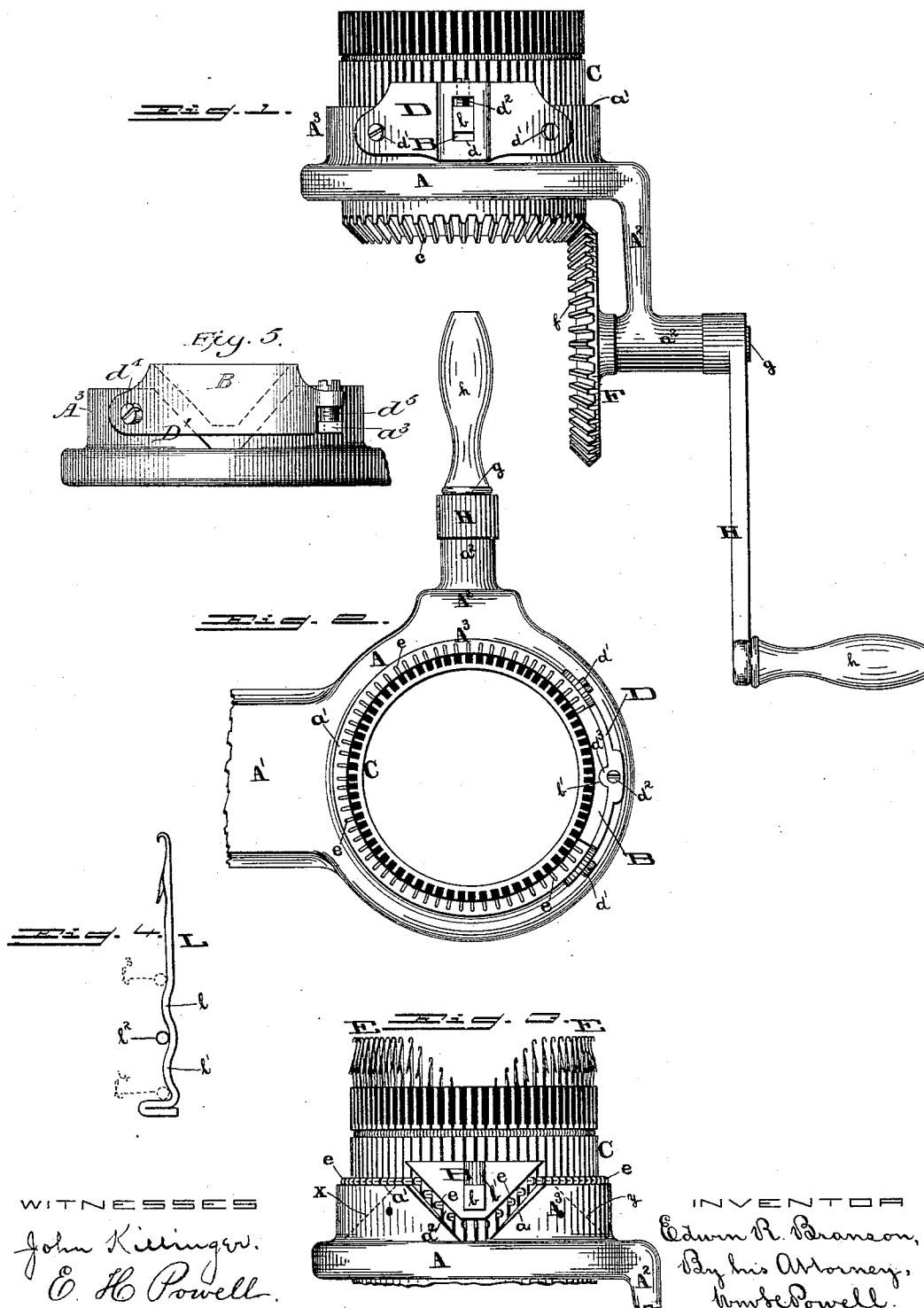


(No Model.)

E. R. BRANSON.
CIRCULAR KNITTING MACHINE.

No. 493,575.

Patented Mar. 14, 1893.



WITNESSES

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UNITED STATES PATENT OFFICE.

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CIRCULAR-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 493,575, dated March 14, 1893.

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To all whom it may concern:

Be it known that I, EDWIN R. BRANSON, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Circular-Knitting Machines, of which the following is a specification.

My invention has relation to circular-knitting machines and has for its object to improve and simplify the construction thereof, to the end that the expense of manufacturing the same may be considerably lessened, without detracting from their efficiency and durability.

My invention consists in providing the base of the machine with a cam-depression within which is located a cam, the latter being at such distance from the edge of the depression as to leave an intervening space or cam-slot, for the passage of the heels of such of the needles as are in operation, and provisions which permit of the passage, over the cam, of the heels of such needles as are raised or out of operation, said cam being of such shape as to permit of the passage of the heels of the operating needles through said slot in either direction.

My invention further consists, in combination with the cam aforesaid, in providing the base of the machine with an annular upward extension, in which is located the depression mentioned, within which the needle-cylinder rotates and in such relation with said cam-cylinder that the heels of the needles will slide horizontally on the upper edge or top thereof and be thus maintained in their normal elevated positions; the top of the cam being so located, relatively to the top of the extension, that said cam will cause the deflection of such of the heels of the needles as are on the extension into and through the slot, for the purpose above-mentioned, while having provisions to permit of the passage thereof of the heels of such needles as are raised out of operative relation with said extension and cam.

My invention also consists in the provision of a cam-support, outside of said depression, upon which the cam is vertically adjustable, for regulating the length of stitch, said support, also, limiting the adjustability of said

cam so as to avoid the closing of the cam-slot to such an extent as to prevent the passage of the heels of the needles therethrough, and the raising of the cam to such height as to prevent the passage of the heels of inoperative or raised needles thereover.

My invention still further consists in the details of construction and the combinations of parts as hereinafter fully described and claimed and as illustrated in the accompanying drawings, wherein

Figure 1 is a side elevation of a knitting machine, with the needles removed, having my improvements applied thereto. Fig. 2 is a plan view, partly broken away, of the same, showing the needles in position. Fig. 3 is a side elevation of a detail of the improved machine, and Fig. 4 a similar view of a modified form of needle. Fig. 5 is a modification of the improved cam and its support.

In said drawings, A represents the base of the machine provided with the lateral extension A', for securing to a table or other support and sustaining the usual bobbin-spindles and yarn-guide, neither of which latter, however, being shown.

A² is the shaft-hanger terminating in the box or bearing a², the latter having journaled therein the driving-shaft g, said shaft having secured thereto the bevel-gear F and being provided with the crank H.

A³ represents an upwardly projecting annular extension or flange, practically a cam-cylinder, preferably cast integral with the base A, having a triangular or substantially V shaped notch or depression a therein and having its upper edge or top a' smooth and in a horizontal plane, said extension having its interior bored out smoothly, so as to afford a bearing for the needle-cylinder C, the latter being provided with the teeth c, engaging with the teeth f of the bevel-gear F, and having adjacent thereto a peripheral groove for reception of lugs, secured to the under side of the base A, whereby said cylinder is secured in the extension, said lugs and groove not, however, appearing in the drawings.

B is a cam of the same shape as, or similar to, the depression a and provided with a guide-block or lug b, and D is a plate or retainer provided with a vertical slot d, for reception of the lug b, and secured at each end, by the

screws d' , to the extension A^3 in such position as to span the depression at the outer side thereof, such plate thus operating to retain the cam B in the depression a and said slot affording vertical movement for said cam, such movement being governed by the impact of the screw or adjusting device d^2 , and the release thereof, on the block b , the bottom of slot d being so disposed, relatively to the bottom of the notch or depression a , as to prevent the cam B from closing the space or cam-slot a^2 between it and said depression to such extent as to bar the passage of the heels e , of the needles E, therethrough, while the top of said slot limits the upward movement of the cam, preventing its reaching such a height as to prevent the passage of the heels of raised or inoperative needles thereover. As will be observed, the plate D has a swell or bulge d^3 above the slot d , affording a bearing for the screw d^2 and engaging with a corresponding groove b' in the cam B, while said plate is thickened at each side of slot d , said swell and groove serving to assist in the alignment of the cam and the thickened portions affording better slide-ways for the block b of the latter.

My invention is not confined to use with a yarn-carrier of any particular character, therefore it is not considered necessary to show or describe the same herein, as any of the ordinary or other suitable forms of carriers may be applied thereto, without departing from the spirit of said invention.

The operation is as follows: The crank H is actuated, through the medium of the handle h , causing the rotation of the cylinder C, the heels e of the needles which are carried thereby sliding on the top a' of the extension A^3 , whereby said needles receive a horizontal movement and are maintained in their normal elevated positions, until they strike the opposing edge of the cam B, the top of the latter being high enough to prevent the needles, in this position, from passing over the same. Thus said heels are deflected and caused to pass through the slot a^2 , effecting the fall and rise of said needles, the latter thereafter regaining their original altitudes on the top of extension A^3 and resuming their horizontal movement. The yarn-carrier, (not shown,) meanwhile feeding the yarn at the proper time to the needles. As is well known, in order to knit a heel or toe, for instance, it is necessary that a portion of the needles be raised and out of operation, while the rest of the needles are given a reciprocal movement through the cam-slot. In this connection it may be stated that the top of the cam, at all times and regardless of the length of stitch, is low enough to permit of the passage thereover of the heels of such needles as are raised as aforesaid, while the shape of the cam is such as to not interfere with the passage of the operating needles, in either direction, through said slot.

In lieu of having the cam B and plate D

separate each from the other, they may, if desired, be in rigid relation, as shown in Fig. 5. In which event the plate D' may have one end pivoted, as on the screw d^4 , and the other end swiveled, or otherwise adjustably sustained, on the adjusting screw d^5 , the latter engaging with a threaded opening in the lug a^3 on the extension or flange A^3 .

While I have shown and described the use of an annular extension of the bed-plate or base upon the edge of which the heels of the needles rest for the support of the latter in their normal positions, it is quite obvious that this particular method of supporting said needles is not necessary to the operation of the other part of my invention. In fact, the portion of said extension which lies outside of the dotted lines x and y may be entirely dispensed with and the extension be only of such size as to permit of the location of the notch or recess therein, such, for example, as the portion of the extension A^3 which lies inside of said lines and in which is located the notch or recess a . In this event, any desired means may be employed for the support of the needles, for instance, the latter may be formed like the needle L, in Fig. 4, the same having a curve l therein in addition to the usual curve l' , the needles being supported in their normal positions by the coil-band l^2 which rests, as shown, in the depression between said curves. On the other hand, when the needles are in their lowermost positions in the cam-slot the coil-band assumes the position shown in dotted lines at l^3 , and when said needles are raised for the purpose of placing them out of operation, said band assumes the position shown in dotted lines at l^4 , the coil-band, at all times, exerting sufficient pressure on the needles to keep them in their proper positions, at the same time not interfering with their operation.

What I claim as my invention is as follows:

1. In a knitting-machine, the combination of the base provided with a cam-depression, and a cam in said depression, the space between the edges of the latter and the cam forming a cam-slot for the passage of the heels of such needles as are in operation, and provisions to permit of the passage over said cam of the heels of such needles as are out of operation, substantially as and for the purpose specified.

2. In a knitting-machine, the combination of the base provided with a cam-depression, and a cam adjustably sustained in said depression, the space between the edges of the latter and the cam forming a cam-slot for the passage of the heels of such needles as are in operation, and provisions to permit of the passage over said cam of the heels of such needles as are out of operation, substantially as and for the purpose specified.

3. In a knitting-machine, the combination of the base provided with a cam-depression, a support outside of the latter, and a cam in said depression and vertically adjustable on

said support, the space between the edges of the depression and the cam forming a cam-slot for the passage of the heels of such needles as are in operation, and provisions to permit of the passage over said cam of the heels of such needles as are out of operation, substantially as and for the purpose specified.

4. In a knitting-machine, the combination of the base provided with a cam-depression, a support outside of the latter, and a cam in said depression and vertically adjustable on said support, the space between the edges of the depression and the cam forming a cam-slot, and provisions to permit of the passage over said cam of the heels of such needles as are out of operation said cam being V-shaped to permit of the passage of the heels of such needles as are in operation through said slot in either direction, substantially as and for the purpose specified.

5. In a knitting-machine, the combination of the base provided with an annular upward extension, a cam-depression in the extension, and a cam in the depression, the space between the edges of the latter and the cam forming a cam-slot, the top of said extension being in a horizontal plane so that the heels of the needles will slide thereon and be caused, by said cam, to pass through said slot, and provisions to permit of the passage over the cam of such heels as are raised or out of operative relation with said extension, substantially as and for the purpose specified.

6. In a knitting-machine, the combination of the base provided with an annular upward extension, a cam-depression in the latter, a support outside of the depression, a cam in said depression and vertically adjustable on said support, the space between the edges of the cam and depression forming a cam-slot, the top of the extension being in a horizontal plane so that the heels of the needles will slide thereon and be caused, by said cam, to pass through said slot, and provisions to permit of the passage thereover of such heels as are raised or out of operative relation with said extension, substantially as and for the purpose specified.

7. In a knitting-machine, the combination of the base provided with an annular upward extension, a cam-depression in the extension, a support outside of the depression, a cam in said depression and vertically adjustable on said support, the space between the edges of the cam and depression forming a cam-slot, the top of said extension being in a horizontal plane so that the heels of the needles will slide thereon and be caused, by said cam, to pass through said slot, and provisions to permit of the passage thereover of such heels as are raised or out of operative relation with the extension said cam being V shaped to per-

mit of the passage of the operating needles through the slot in either direction, substantially as and for the purpose specified.

8. In a knitting-machine, the combination of the base provided with a cam-depression, a plate spanning the latter and provided with a vertical slot, a cam in said depression provided with a lug in said slot, and an adjusting device acting on said lug, the space between the edges of the cam and depression forming a cam-slot for the passage of the heels of the needles, substantially as and for the purpose specified.

9. In a knitting-machine, the combination of the base provided with an upwardly projecting extension, the latter having therein a cam-depression, a plate spanning the depression and provided with a vertical slot, a cam in said depression having its top above the top of the extension and provided with a lug in said slot, and an adjusting device acting on said lug, the space between the edges of the cam and depression forming a cam-slot for the passage of the heels of the needles, substantially as and for the purpose specified.

10. In a knitting-machine, the combination of the base provided with an upwardly projecting annular extension having its top in a horizontal plane to permit of the sliding of the heels of the needles on the edge thereof, a cam-depression in said extension, a plate spanning the depression and provided with a vertical slot, a cam in said depression having its top above the top of the extension and provided with a lug in said slot, and an adjusting device acting on said lug, the space between the edges of the cam and depression forming a cam-slot for the passage of said heels, substantially as and for the purpose specified.

11. In a knitting-machine, the combination of the base having integral therewith an upwardly projecting annular extension having its top in a horizontal plane to permit of the sliding of the heels of the needles on the edge thereof, a cam-depression in said extension, a plate spanning said depression and secured to the extension and provided with a vertical slot, a cam in said depression having its top above the top of said extension and provided with a lug in said slot, and an adjusting screw sustained by said plate and acting on said lug, the space between the edges of the cam and depression forming a cam-slot for the passage of said heels, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 2d day of June, A. D. 1892.

EDWIN R. BRANSON.

Witnesses:

R. DALE SPARHAWK,
WM. H. POWELL.