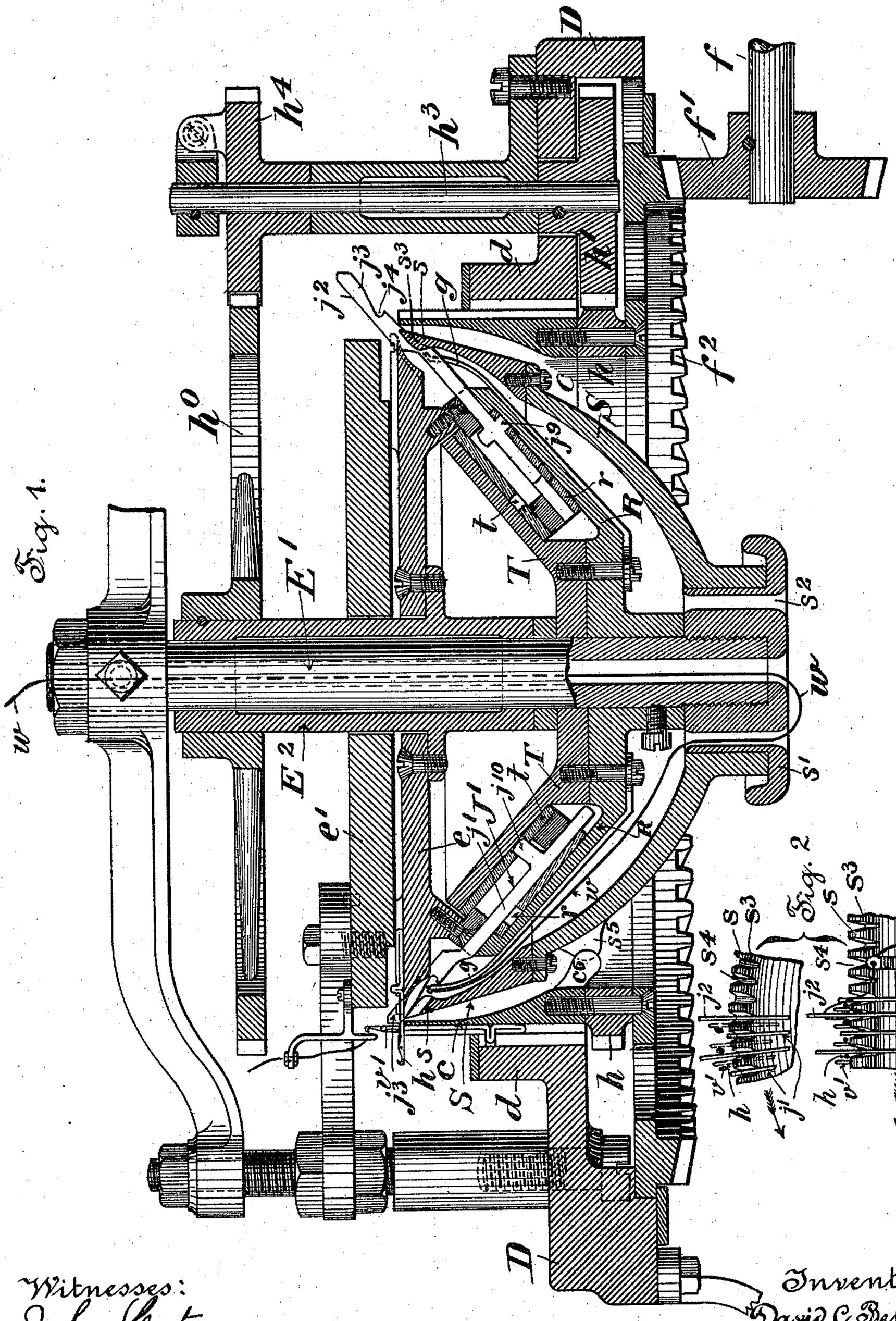
(No Model.)

# D. C. BELLIS.

## KNITTING MACHINE.

No. 574,129. Patented Dec. 29, 1896.



# UNITED STATES PATENT OFFICE.

DAVID C. BELLIS, OF ELIZABETH, NEW JERSEY.

## KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 574,129, dated December 29, 1896.

Application filed October 22, 1896. Serial No. 609,637. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID C. BELLIS, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented new and useful Improvements in Knitting-Machines, of which the following is a specification.

My invention is an improvement on the knitting-machine for which United States Patent No. 561,559 was granted to me on June 9, 1896, and which is adapted to produce ribbed knit fabric with a backing.

The improvements consist of providing a ring between the needle-cylinder and the periphery of the needle-dial, first, to prevent the backing-loops after they have been formed from interfering with the jacks and dial-needles; secondly, to shield the last-formed backing-loops, so that when the next set of jacks push the woolen backing-thread over the cylinder-needles such jacks will not cut or disarrange the loop formed previously by the other set of jacks; thirdly, to provide a guide or support for the dial-needles and jacks, and, fourthly, to so form the upper part of the ring as that in looping the backing-thread a proper feed or slacking of the latter is had to produce uniform scallops and to form the dial-stitches on the peripheral edge; and the improvements further consist of the said ring in combination with devices, as hereinafter more fully described, and pointed out in the claims.

My improvements will be more fully understood taken in connection with the accompanying drawings, in which—

Figure 1 is a transverse section of the knitting-machine, and Fig. 2 is a view showing the upper part of the ring adapted to provide a proper slack for the formation of the scallops of the backing.

Parts shown in the drawings of this application, which are similar to those shown in the drawings of the Letters Patent No. 561,559, have the same reference-letters in order to facilitate the understanding of the machine and its working.

Referring now to the drawings for a further description of the knitting-machine and the improvements, D is the bed of a circular-knitting machine provided with the stationary cam-cylinder $d$ and rotatable needle-cylinder $c$ for the vertical or cylinder needles $v'$. $e$ is the rotatable needle-dial for the horizontal needles $h$, which are actuated by cams on the stationary cam-dial $e'$. These parts are constructed in the well-known manner, and the needle-cylinder $c$ is operated from the main shaft $f$ by the bevel-gears $f'$ and $f^2$, while the needle-dial $e$ is operated from the bevel-wheel $f^2$ by the gear-wheels $h$ $h'$, shaft $h^3$, gear-wheels $h^4$ $h^0$, and sleeve $E^2$, surrounding the spindle E'. Jacks $j'$ and $j^2$ are employed to move a thread $w$ over the cylinder-needles $v'$, and these are mounted in grooves of a conical jack-bed J', secured in any suitable manner to the needle-dial $e$. The jacks $j'$ $j^2$, having hubs $j^9$ $j^{10}$, are operated by cams $r$ and $t$, which are mounted on the stationary cam-beds R and T, respectively, and supported on the spindle E', as described in the said Letters Patent.

Between the periphery of the dial $e$ and the inner upper edge of the cam-cylinder $c$, which is cut away considerably, is located the upper edge $s$ of the annular ring S, made in two parts screwed together and journaled on the socket $s'$, which is provided with as many openings $s^2$ as there are thread-guides $g$, the woolen or other backing-thread being passed, in this instance from the outside of the machine through the spindle E', through one of the openings $s^2$, and to and through the hole in the top of the thread-guide $g$, which is so formed as to lay the thread $w$ right into the hooks of the jacks $j'$ $j^2$. The latter are provided with upper portions $j^3$, in the lower edge of which the hook $j^4$ is formed, while the upper edge is held in notches of the dial $e$ for guidance. In the longitudinal movement of these jacks they are further guided by the grooves or notches in the upper edge $s$ of the ring S, in addition to the guidance given by the bed J', in whose grooves they are slidingly mounted.

The upper edge $s$ of the ring S is carried up so as to be in line with the lower edge of the dial-needles, which are supported thereon when moving outwardly, and so that the forming of the stitch or loop by the dial-needles $h'$ is accomplished, as the edge of the dial on which this operation in ordinary machines is

always performed is moved toward the center of the machine, too far away from the needle-cylinder *c* to form a proper stitch. The upper peripheral edge *s* of the ring S also serves to direct the finished fabric, which is drawn by suitable take-ups, downward, so that the newly-formed backing-loops do not come into the way of the jacks to be next actuated, which, as has been found, was the case where no such ring S was provided on the machine, the jacks on such machines generally catching the loop previously formed and tearing on its upward motion the threads apart, destroying in this way the backing, but this is entirely obviated by the use of the said ring S.

To form scallops of uniform size, the upper inner edge of the ring S is provided with a rounded portion $s^3$, through which the grooves $s^4$ for the jacks $j' j^2$ extend. These grooves $s^4$ are corrugated or wedge-shaped, so that when its jacks move upward the thread *w*, held at one point between the stitches formed by a vertical needle, is drawn by its thread-guide and the proper jack $j' j^2$ around such rounded-off portions lying between every third groove $s^4$, and thereby giving the proper length of thread for a backing-loop to be formed, as will be readily understood by those skilled in the art to which this invention appertains.

The ring S in its rotation with the jack-bed J', needle-dial *e*, and needle-cylinder *c* is held in alinement with the same by the projections $s^5$ and $c^6$, but such projections may be omitted, as the jacks $j' j^2$ are mounted in the jack-bed J', needle-dial *e*, and needle-cylinder *c*, and insure a proper and simultaneous movement of the said parts.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a knitting-machine, the combination with a needle-cylinder, needle-dial, and jack-bed, of a ring supported centrally within the machine and having its peripheral edge between the edges of the needle-dial and needle-cylinder, substantially as and for the purposes set forth.

2. In a knitting-machine, the combination with a needle-cylinder, needle-dial and jack-bed, of a ring supported centrally within the machine and having its upper peripheral edge notched for the reception and guidance of jacks slidingly held in said jack-bed, substantially as and for the purposes set forth.

3. In a knitting-machine, the combination with a needle-cylinder, needle-dial, jack-bed, needles, jacks and cams therefor, of a ring supported centrally within the machine and having its upper peripheral edge between the edges of the needle-dial and needle-cylinder, said upper ring edge provided with a rounded-off rim and notches for the reception and guidance of jacks slidingly mounted in the said jack-bed, substantially as and for the purposes set forth.

4. In a knitting-machine, the combination with a needle-cylinder, needle-dial, jack-bed, needles and jacks therefor and means for operating the same, of a ring supported on a hollow spindle held centrally within the machine, thread-holes in the lower part of the ring, said ring having its upper peripheral edge notched and rounded off on the inner side, substantially as and for the purposes set forth.

5. A knitting-machine for producing ribbed knit fabrics, having two sets of needles and cams therefor, jacks or loopers operated by cams to bring an extra thread from the inside of the machine over certain of the needles, in combination with a ring supported centrally within the machine, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

DAVID C. BELLIS.

Witnesses:
ANTOINETTE H. BRUSH,
LOUIS H. NOE.