(No Model.) 2 Sheets—Sheet 1.

W. D. HUSE & C. F. CARR.

CIRCULAR KNITTING MACHINE.

No. 422,593. Patented Mar. 4, 1890.

Fig. 1.

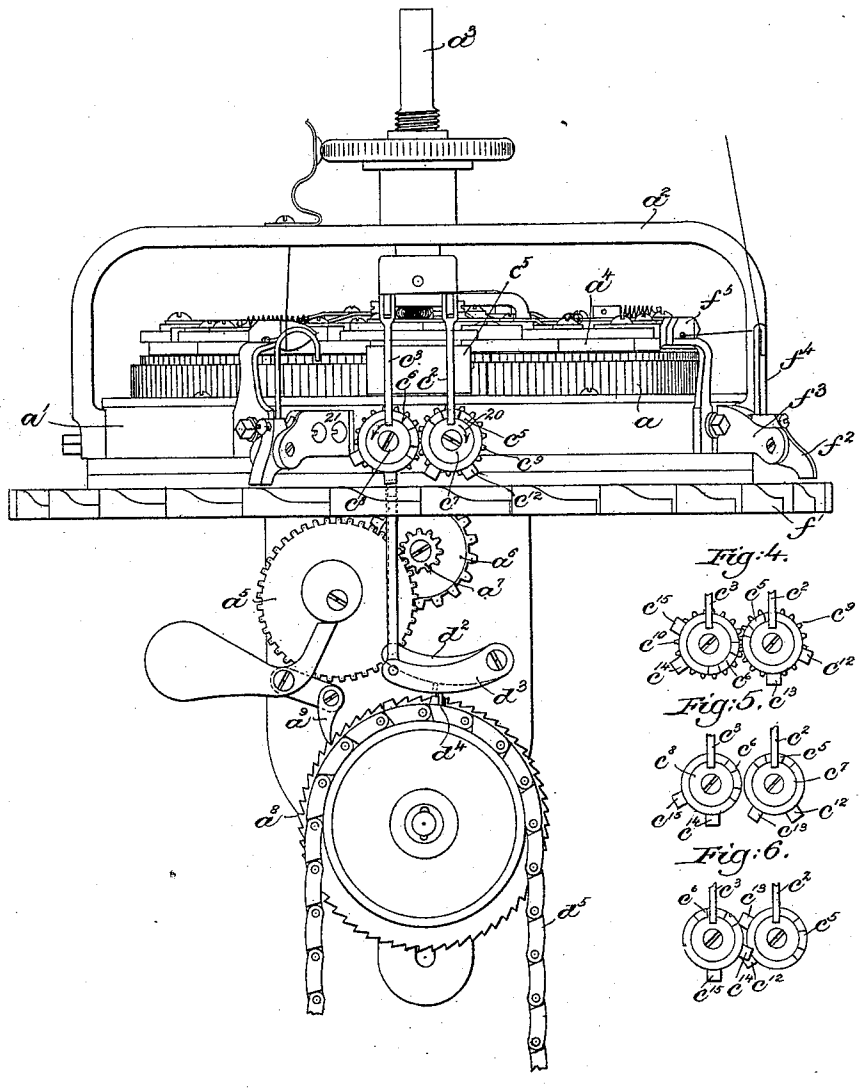


Fig. 4.

Fig. 5.

Fig. 6.

Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

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CIRCULAR KNITTING MACHINE.

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Fig. 2.

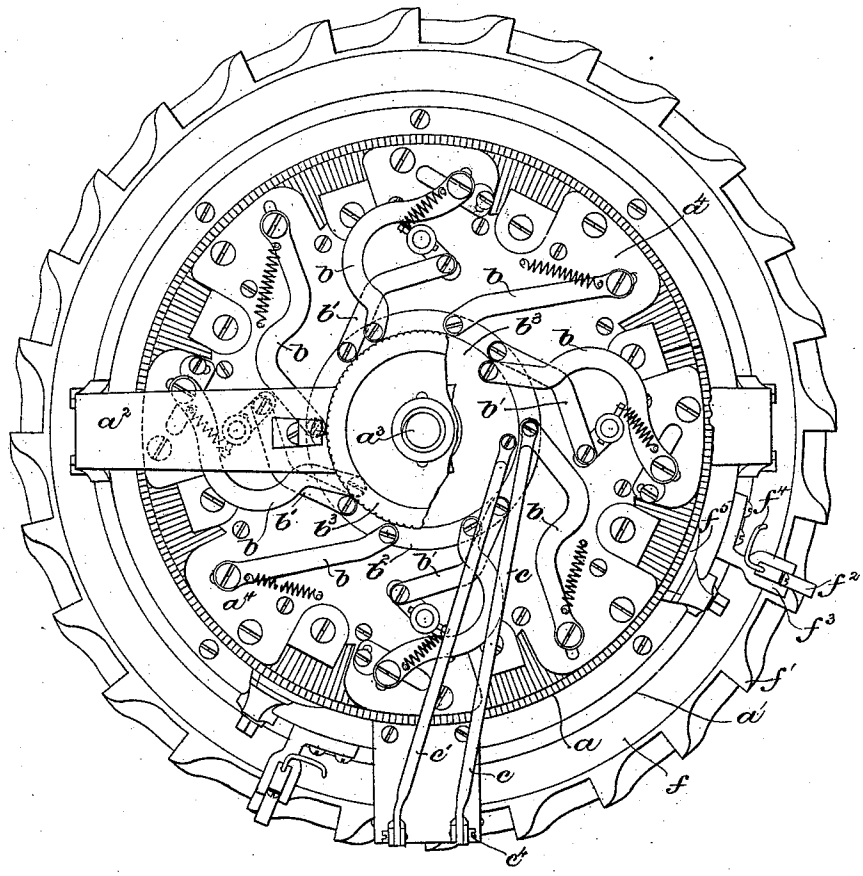
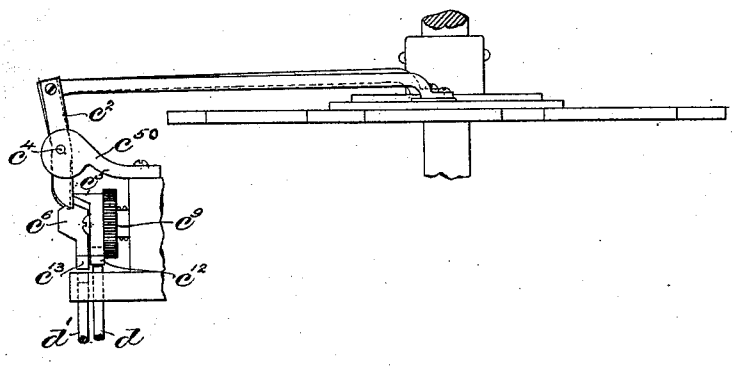


Fig. 3.



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UNITED STATES PATENT OFFICE.

WARREN D. HUSE AND CHARLES F. CARR, OF LACONIA, NEW HAMPSHIRE; SAID CARR ASSIGNOR TO SAID HUSE.

CIRCULAR-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 422,593, dated March 4, 1890.

Application filed February 11, 1889. Serial No. 299,479. (No model.)

To all whom it may concern:

Be it known that we, WARREN D. HUSE and CHARLES F. CARR, both of Laconia, county of Belknap, State of New Hampshire, have invented an Improvement in Circular-Knitting Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention in knitting-machines is an improvement upon that class of machines shown and described in United States Patent No. 313,593, dated March 10, 1885, wherein a single cam-disk having projections is rotated by the said projections striking two rods.

One feature of our invention consists in employing two cam-disks which are geared together, as will be described, so that when one disk is moved in one direction to operate one or more cams on the dial cam-plate in one direction—such, for instance, as to place the dial-needles co-operating with those cams in operative position—the other disk is moved in the opposite direction to render some or all of the remaining dial-needles inoperative, as will be described.

The dial cam-plate will preferably be such as shown and described in another application, Serial No. 280,013, filed July 16, 1888.

The particular features in which our invention consists will be pointed out in the claim at the end of this specification.

Other features of our invention will be pointed out in the claim at the end of this specification.

Figure 1, in elevation, shows a sufficient portion of a knitting-machine embodying our invention to enable it to be understood; Fig. 2, a top or plan view of the machine shown in Fig. 1, with the yoke partially broken out; Fig. 3, a detail in elevation to more clearly show the cam-disks, which are geared together, the said figure being a side elevation of Fig. 1 looking toward the left; and Figs. 4, 5, and 6, detail views showing different positions of the cam-disks, as will be referred to.

The cylinder a, carrying the vertical needles, the cam-ring a', carrying the stitch-cams, (not shown,) for operating the vertical needles, the yoke a^2, connected to the cam-ring and forming bearings for the vertical spindle a^3 of the dial-plate a^4, and the driving mechanism, consisting of the gears a^5 a^6, pinion a^7, ratchet-wheel a^8, and weighted pawl a^9, may be substantially such as shown in the patent referred to.

The dial cam-plate a^4 is substantially the same as shown in the application referred to, it being provided on its under side with eight sets of cams, each set comprising a drawing-in and a throwing-out cam, four of the said throwing-out cams being made movable and four stationary, and all the drawing-in cams being made movable. Each movable drawing-in cam has connected to it one end of a link b, and each movable throwing-out cam has connected to it one end of a link b'. The spindle a^3 of the dial-plate has mounted on it, as herein shown, two rings b^2 b^3, to which the links b b' are connected to produce plain ribbed work or tuck-work. As shown in the drawings, all the links b' are connected to the ring b^2 and six of the links b connected to the ring b^2, and two of the links b are shown connected to the ring b^3. With the links connected, as shown, a triple tuck may be produced, as described in the application referred to. The rings b^2 b^3 have connected to them, respectively, links c c', connected to levers c^2 c^3, pivoted, as at c^4, to a bracket c^{50}, secured to the cam-ring. The levers c^2 c^3 are respectively operated by means of cams c^5 c^6 on disks c^7 c^8, pivoted to the cam-ring. The disks c^7 c^8 are arranged out of line with each other and are geared together to work simultaneously by gears c^9 c^{10}, mounted on the pivots of the said gears. The disks c^7 c^8 are provided with projections c^{12} c^{13} c^{14} c^{15}, which are engaged by the rods d d', secured to the levers d^2 d^3, provided with the studs or projections d^4 to be acted upon by the pattern on the pattern-chain d^5. The disks c^7 c^8 are geared together, so that their cams will not act simultaneously on the levers, but only one at a time, as will be described.

As shown in Fig. 1, the cam c^5 is acting on the lever c^3, and the drawing-in cams, connected to the ring b^2, are moved inwardly into their normal or operative position to produce tuck-work, as described in the said ap-

plication, while the throwing-out cams, connected to the ring b^3, are in their outermost position.

The cam c^5 remains in contact with the lever c^2 until a second cam on the pattern-chain acts on the pin d^4, and again raises the rod d into position to strike the stud or projection c^{12} and rotate the disks c^5 c^6, through the gears c^9 c^{10}, from the position shown in Figs. 1 and 5 to that shown in Fig. 6, thus removing the cam c^5 from engagement with the lever c^3 and engaging the cam c^6 with the lever c^3.

The cam c^6 remains in engagement with the lever c^3 until a cam on the pattern-chain acts on the pin d^4 on the lever d^3 and raises the rod d', so as to strike the stud c^{15} and turn the disks c^7 c^8 back into the position shown in Fig. 5.

The disks c^7 c^8 remain in position shown in Fig. 5 until the rod d' is again raised into engagement with the stud c^{14}, the said disks being turned into the position shown in Fig. 4.

We have thus far described the cam-disks geared together as used for producing movement of the dial-cams; but it is evident they may be used instead of a single cam-disk for actuating the thread-guides, substantially as described in the patent referred to, for the production of striped work.

We claim—

The combination, with the dial cam-plate and rings mounted thereon and adapted for connection with the movable cams of the said dial cam-plate, of the cam-ring, the disks c^7 c^8, pivoted thereon and provided with gears in mesh with each other to rotate said disks in opposite directions, cams on said disks, levers connected to the rings on the dial-plate, projections on the said disks, rods to engage said projections to rotate said disks, and pattern devices to raise the said rods, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WARREN D. HUSE.
CHAS. F. CARR.

Witnesses:
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S. E. BLACKSTONE.