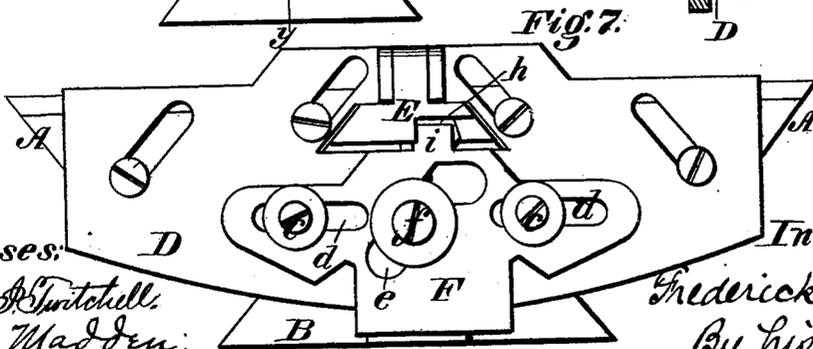
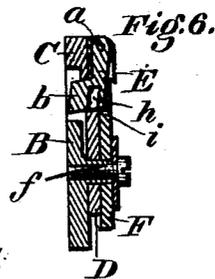
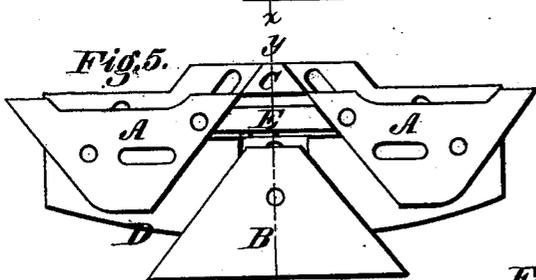
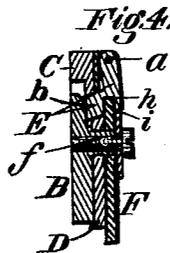
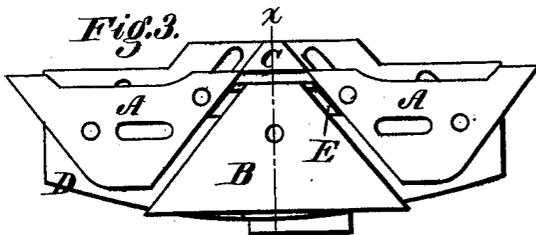
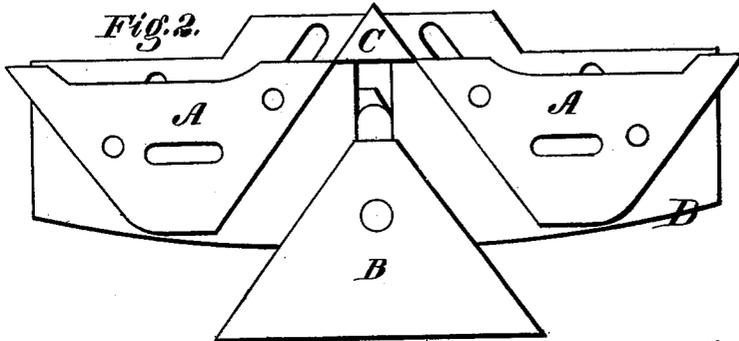
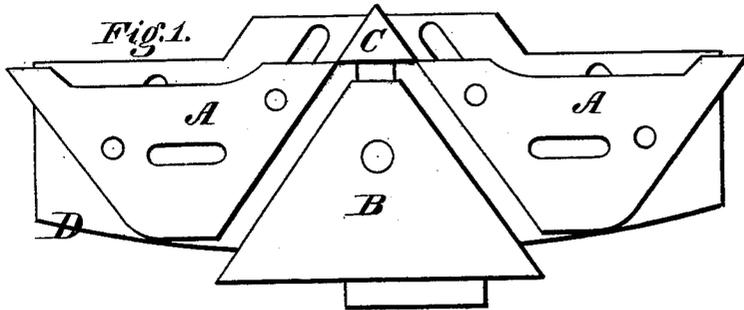


F. DENZLER.  
Knitting Machine Cams.

No. 204,426.

Patented June 4, 1878.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

FREDERICK DENZLER, OF BROOKLYN, NEW YORK, ASSIGNOR TO LAMB KNITTING MACHINE MANUFACTURING COMPANY, OF CHICOPEE, MASS.

## IMPROVEMENT IN KNITTING-MACHINE CAMS.

Specification forming part of Letters Patent No. 204,426, dated June 4, 1878; application filed March 11, 1878.

*To all whom it may concern:*

Be it known that I, FREDERICK DENZLER, of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Knitting-Machine Cams, of which the following is a specification:

This invention relates to an improvement in that class of straight-knitting machines in which longitudinally-sliding needles moved by cams are employed, and particularly to what is known in the art as the "drop-lock" or cam used in order to adapt the machine to knit the "Cardigan" or "polka" stitch.

In forming this stitch the  $\Lambda$  cam, by which the needles are elevated, is lowered during certain stages of the work, in order that the needles shall have less vertical movement, so that they will not rise far enough to carry the latch entirely above the loop of the stitch, so that the loop, instead of dropping the latch, will be carried into the hook of the needle as the latter descends with its latch in the reversed or closed position.

In operating machines of the ordinary construction it has been found that when the  $\Lambda$ -cam is dropped to its lower position and the machine run rapidly the projection on the shank of the latch-needle, which rides on the cam, is carried by its momentum too high, or, in other words, that when it has ascended one side of the cam to the top of the same, there being nothing for it to strike against and nothing to make it keep down and follow across the top of the cam, its momentum carries it above the same. When the needle thus rises too high it prevents the formation of the polka stitch, because the needle rises too high relatively to the loop, so that the latter, instead of being carried back on the latch into the hook, is carried below the point of the latch, so that it rides over the latter and passes from the needle. Thus the fabric is virtually spoiled, as some of the needles rise beyond the proper line, and consequently discharge the stitches, while others follow the cam in the proper manner, thus producing a diversity of stitches in the fabric.

The object of my invention is to prevent the needles being thrown or carried too high when the drop-lock or cam is depressed; and to this

end it consists in providing a guide or stop of any suitable construction, which may be brought into position above the depressed cam to limit the ascent of the needles, compelling their shanks to follow across the top of the cam.

My guide or stop may be arranged in any appropriate manner, and operated by the movement of the cam or independently, as preferred, a simple arrangement being that represented in the drawings, in which the stop or guide is arranged to swing through an opening in the supporting plate or frame above the cam as the latter is depressed, and to retreat behind the cam as the latter is elevated.

Figures 1 and 2 are diagrams illustrating the ordinary cam or drop-lock, showing the cam in elevated and depressed positions, respectively. Fig. 3 represents a face view of my improved arrangement, with the cam in its elevated position; Fig. 4, a vertical cross-section of the same on the line  $xx$ ; Fig. 5, a face view of the arrangement, with the cam depressed and the movable guide or stop in its operative position; Fig. 6, a cross-section of the same on the line  $yy$ ; Fig. 7, an outside or back view, showing the manner in which the parts are supported and the adjustments provided for.

A A represent two V-shaped cams, ordinarily known as the "wing-cams," by which the needles are depressed; B, the intermediate vertically-adjustable cam of the inverted V form, by which the needles are elevated; C, a stop or guide, located between the cams A A and above the cam B, for the purpose of limiting the ascent of the needles and causing their shanks to travel across the top of the cam B after being elevated thereby. As shown in Figs. 1 and 2, the stop or guide C is ordinarily fixed and immovable, so that when the cam B is dropped, as in Fig. 2, the needles are still at liberty to ascend, in consequence of their momentum, to the same height as when the cam B is in its elevated position. D represents the frame or back plate by which the cams are supported.

Referring now to Figs. 3, 4, 5, 6, and 7, E represents my movable guide or stop, consisting of a plate pivoted at the point  $a$  to the

back of the frame D, and provided at its lower edge with a horizontal lip, *b*, when the latter is in its depressed position, as shown in Figs. 3 and 4. When the cam is elevated and the guide or stop thrown back, the needles are limited in their ascent by the stop C, as shown, and when the cam is depressed the ascent of the needles is limited by the stop E.

For the purpose of causing the automatic movement of the cam B and stop E relatively to each other, I mount on the back of the frame-plate D a horizontally-sliding plate, F, sustained by screws *c* passing through slots *d* in its ends. In its middle I provide the plate F with an oblique slot, *e*, to receive a stud or screw, *f*, extending backward from the cam B, as shown in Figs. 6 and 7, and in the lower rear edge of the swinging guide or stop E I form an oblique groove, *h*, and provide the plate F with a lip, *i*, to enter said groove, as shown in Figs. 4, 6, and 7. When the plate F is moved toward the right its oblique slot causes the descent of the cam B, and at the same time its lip *i* causes the guide E to swing forward into its operative position above the cam. The reverse movement of the plate F throws the guide backward out of action and elevates the cam.

It is manifest that a different arrangement may be employed for securing the simultaneous adjustment of the cam and guide, that the two may be connected directly or indirectly in any suitable manner, and that a guide may be

arranged to advance and retreat vertically and laterally, provided it is arranged to assume the proper position in relation to the cam when the latter is depressed.

Having thus described my invention, what I claim is—

1. In a knitting-machine, a solid needle-elevating cam capable of a vertical adjustment, and arranged, substantially as described, so that the needles always pass over its top, in combination with an adjustable stop or guide, to limit the ascent of the needles and compel them to follow across the top of the cam when it is in its depressed position, substantially as described and shown.

2. In combination with a needle-elevating cam capable of vertical adjustment, a stop or guide to limit the ascent of the needles connected with the cam, substantially as described, so that as the latter is depressed the stop is automatically brought into position above it.

3. The combination of the cams A B, stop C, and adjustable stop E.

4. In combination with the adjustable cam B, the guide or stop E, adjustable forward and backward through the frame D.

5. In combination with the cam B and guide or stop E, the plate F, arranged to adjust both the cam and the guide.

FREDERICK DENZLER.

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