

(No Model.)

J. L. ECK.
KNITTING MACHINE.

No. 578,005.

Patented Mar. 2, 1897.

Fig. 1.

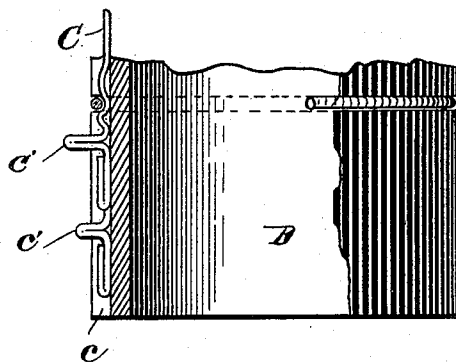
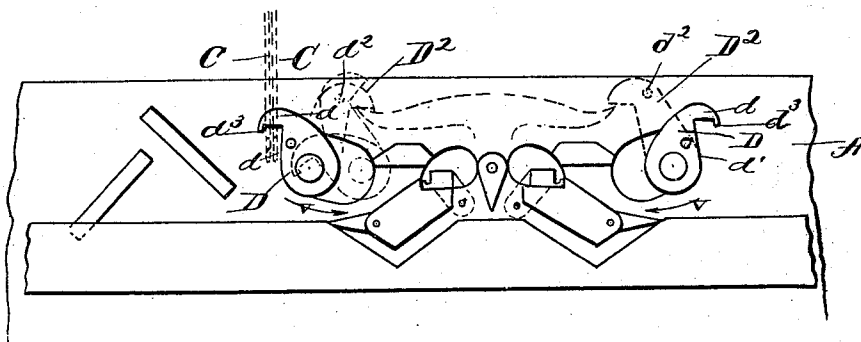


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

JAMES L. ECK, OF READING, PENNSYLVANIA.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 578,005, dated March 2, 1897.

Application filed January 16, 1896. Serial No. 575,733. (No model.)

To all whom it may concern:

Be it known that I, JAMES L. ECK, a citizen of the United States, residing at Reading, county of Berks, State of Pennsylvania, have
5 invented a certain Improvement in Knitting-Machines, of which the following is a specification.

My invention relates particularly to circular-knitting machines of the class shown in
10 Patent No. 523,111, issued to me July 17, 1894, and in a pending application, Serial No. 549,640, filed by me May 17, 1895; and it consists in a certain improvement in the form of the cams employed to throw down the raised
15 needles during the widening operation whereby I am enabled to run the machine at a much increased speed without danger of breakage or imperfect work and correspondingly increase the output of the machine.

20 The invention is fully described in connection with the accompanying drawings and is specifically pointed out in the claims.

Figure 1 is an elevation, partly in section, of the needle-cylinder of a machine to which
25 my improvement is applicable. Fig. 2 is an enlarged inside view of a small portion of the cam-cylinder developed into a flat surface and showing my improved throwing-down cam engaging the heels of two needles and
30 indicating in dotted lines different positions assumed in lowering the latter.

Only so much of the machine is shown as is necessary to indicate the relation of the throwing-down cam to the immediate cooperating parts. The rotary cam-cylinder A
35 encloses the fixed needle-cylinder B, in which the needles C are moved up or down, as required, in parallel grooves *c* by a series of fixed and movable cams arranged to engage the
40 heels *c'* of the needles. The throwing-down cam D is one of them. It is carried by an exterior arm *D*², which is pivoted at *d*² to the cam-cylinder and is itself pivoted to the lower end of the arm *D*³, so as to be capable of in-
45 dependent movement in one direction, though rigid therewith as to strains in the opposite direction, all as in the prior construction above referred to. My present invention relates particularly to the operation of the cam
50 as a rigid part of the arm *D*³, swinging on the pivot *d*².

When in the position indicated in the draw-

ings, the cam D is adapted to operate upon the end needles of a raised series C C, the heels *c'* of which pass under the hooked
55 end *d* and come in contact with and push against the vertical edge *d'* of the cam. The latter yields to the pressure and swings in the direction of the arrow V on the pivot *d*²
60 until the edge *d'* of the cam assumes a sufficiently-inclined position, as indicated in dotted lines, to allow the needles, which are
65 meanwhile lowered by the downward swing of the cam, to pass under the latter. This operation of lowering the needles, especially
70 if more than one be lowered at one movement, as described in my pending application referred to, is one which has heretofore caused considerable difficulty and necessitated a
75 lower speed than is otherwise desirable. This is due to the liability of a needle escaping from the overhanging portion *d* of the hook when a speed of one hundred reciprocations or more is attained. After great difficulty I
80 have succeeded in overcoming this trouble by a very simple improvement to the form of throwing-down cam described, consisting, essentially, in the addition to the end of the
85 overhanging hook portion *d* of a right-angled offset or stop *d*³, extending therefrom approximately parallel with the edge *d'* of the cam
90 to provide a definite space, extending to the edge *d'*, for the reception of the desired number of needle-heels. When the latter are once engaged in this space, it is practically
95 impossible to dislodge them by any spring or yield of the parts, and I am enabled to increase the ordinary speed of the machine about fifty per cent. with perfect satisfaction
100 and safety. Owing to the very limited space between the needles in many machines, it is necessary that the thickness of the stop *d*³ should be very limited in order to avoid contact with the needle adjacent to those carried
down by the cam, and also that the space allowed between the stop *d*³ and the edge *d'*
should be adapted to just receive the heels of the needles required to be lowered; but I find that the nicety of adjustment necessitated by my improved construction is fully
warranted by the result attained in increased capacity and safety, as described.

What I claim is—

1. A needle-throwing-down cam for a knit-

ting-machine, having a hook end, terminating in a right-angled offset or stop, extending therefrom in a direction approximately parallel to the edge of the body of said cam, 5 thereby providing a definite space for the needle-heels extending from said offset to said edge of the body, whereby the needle-heels are positively retained upon the cams until they should be released by the movement of 10 the latter, substantially as described.

2. In a knitting-machine, the combination with the cam-cylinder, of a pivoted arm, and a pivoted throwing-down cam carried by said

arm and having an independent movement thereon in one direction, said cam having a 15 hook end, terminating in a right-angled offset extending therefrom in a direction approximately parallel with the edge of the cam, substantially as described and for the purpose specified. 20

In testimony whereof I affix my signature in presence of two witnesses.

JAMES L. ECK.

Witnesses:

ADAM L. OTTERBEIN,
W. G. STEWART.