2 Sheets. Sheet 1.

V. G. Arnold,

Knitting Mach.

No. 106,025. Patented Aug 2. 1870.

Fig. 1.

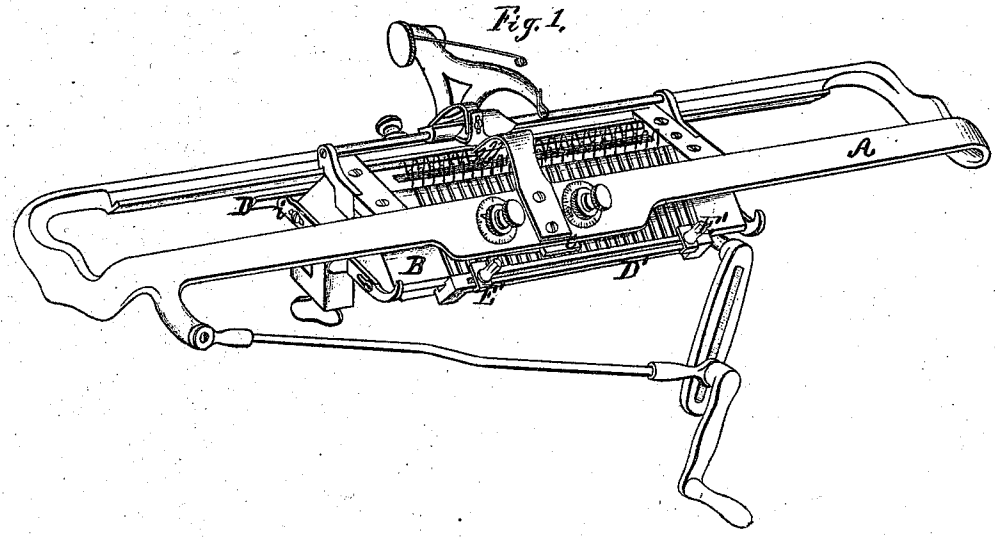
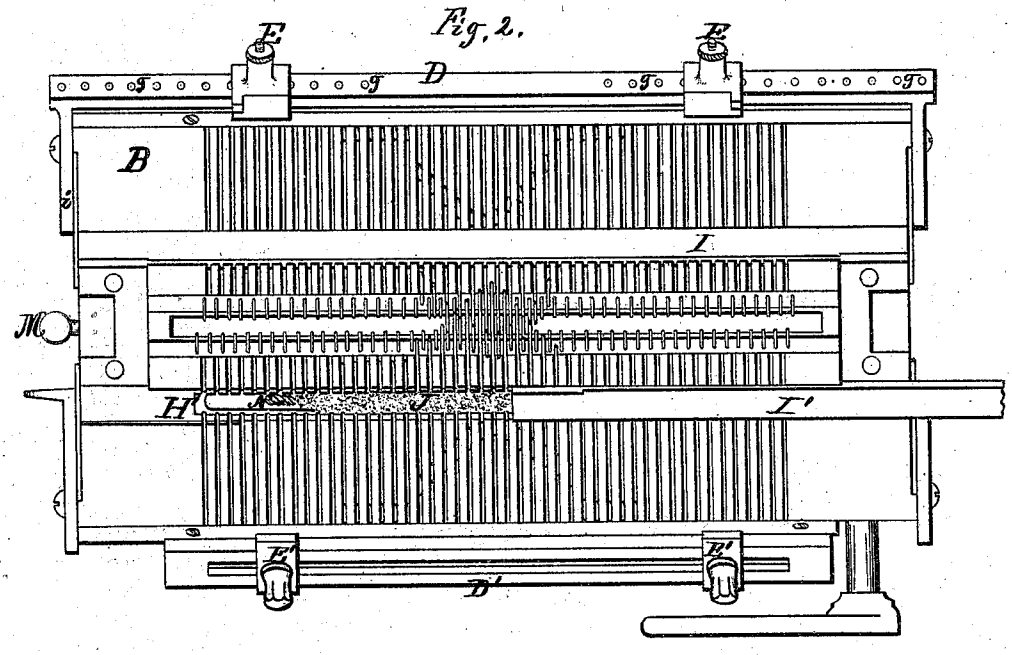


Fig. 2.



Witnesses:
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By Wm. C. Wood
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2 Sheets. Sheet 2.

V. G. Arnold,

Knitting Mach.

No. 100,025. Patented Aug 2. 1870.

Fig. 3.

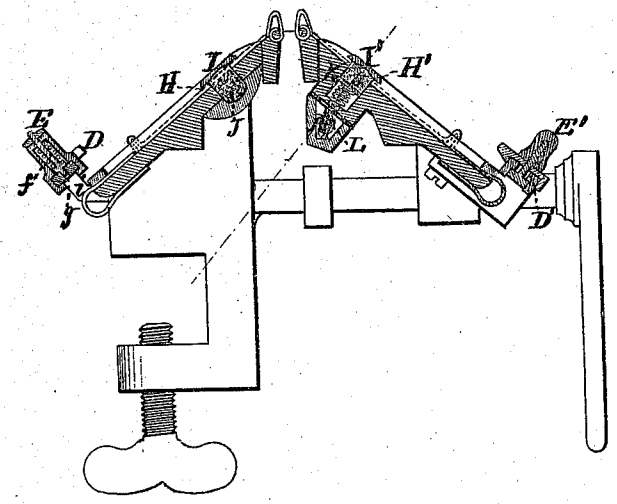


Fig 4.

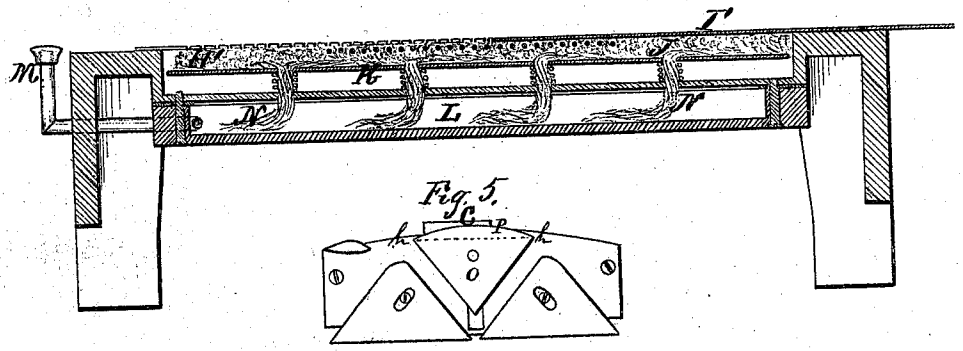
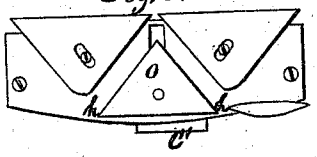


Fig. 5.

Fig. 6.



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UNITED STATES PATENT OFFICE.

VARNUM G. ARNOLD, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN KNITTING-MACHINES.

Specification forming part of Letters Patent No. **106,025**, dated August 2, 1870.

To all whom it may concern:

Be it known that I, VARNUM G. ARNOLD, of the city and county of Providence, in the State of Rhode Island, have invented certain new and useful Improvements in Knitting-Machines.

My invention relates, first, to a novel, neat, and effective mode of lubricating the needles, which is applicable to all kinds of knitting-machines, and consists in surrounding each needle with fibrous absorbent charged with lubricating matter; and, secondly, to a novel arrangement of the cam-stops, which is more particularly applicable to that class of knitting-machines which operate two parallel rows of needles; and I do hereby declare the following specification, taken in connection with the drawing furnished and forming a part of the same, to be a true, clear, and exact description thereof, reference being had to the drawing.

Figure 1, Sheet 1, represents in perspective a Lamb knitting-machine with my improvements attached. Fig. 2 represents the same in top view, with sliding frame or carriage removed. Fig. 3, Sheet 2, represents the same as Fig. 2, in cross vertical section. Fig. 4 represents the lubricating apparatus in longitudinal vertical section. Fig. 5 represents one of the cam-plates, which has been removed from the under side of the carriage A, with my improvements attached. Fig. 6 shows the cam as heretofore used.

The same letters of reference indicate corresponding parts in all the figures.

A represents the sliding frame or carriage. B is the body of the machine, having upon each side a needle-bed. C and C′ are the slides which operate the needle-cams. D and D′ are the bars, upon which are placed the cam-stops E and E′. These cam-stops are adjustable thereon in two different ways. Stops E are provided with vertical spring-spindles *f*, which engage with holes *g* in bar D. Stops E′ are provided with a set-screw, which passes through the stop and a slot in the bar D′, and engages with a clamp-nut beneath.

Either of these arrangements will serve an excellent purpose, although I prefer the spring-spindle.

When but few needles are required it is desirable that the cams be reversed with as little unnecessary movement of the carriage as possible. This latter movement is in itself regulated at pleasure by a slotted crank-arm. The movement of the cams to correspond therewith is effected by the cam-stops, adjustable longitudinally. The distance between the inner faces of the stops should be equal to the distance traveled by the carriage, less double the extent of the throw of the cam-slides.

The ends of the bar D are attached to fixed arms *i*, extending at right angles thereto, each of which is provided with a suitable slot to correspond with the holding-screws of the original cam-stops in the ends of the machine.

The bar D′ is provided with slotted fingers, which are attached to the body of the machine by means of screws on the under side. In this latter case it is necessary to drill holes in the body of the machine especially for this purpose, while in the case of bar D no change in that respect is requisite, and it is therefore far preferable.

H and H′ are narrow slots, extending the entire length of the needle-bed. These slots are common to the Lamb machine and others of a similar character.

I and I′ are slides or gibs fitted to grooves cut in the sides of the slots H. They serve to keep the needles in position, and must be removed in order to remove broken needles or insert new ones.

J is a piece of sponge closely fitted to the slots H. The needles pass through it at right angles. Other fibrous absorbents may be substituted for sponge, although no other known to me is so well adapted to the purpose.

K is a base-plate mounted upon springs. It is fitted loosely into the slots H, and is so arranged that a pressure of the sponge between it and the under side of the gib I is constantly maintained.

L is a reservoir for containing lubricating matter. Oil is fed thereto by means of the duct M, and conveyed therefrom to the sponge J by means of capillary attraction through the wick N, which extends from the reservoir through the plate K, thence along the slot beneath the sponge. The pressure of the springs beneath the plate accomplishes a double purpose: While preventing the sponge from being surcharged with oil, it also keeps it in proper and close contact with the needles.

Needles have been lubricated heretofore by the direct application of oil, and therefore it has always been exceedingly difficult to avoid soiling the work. With my apparatus the upper portion of the needles need never be directly oiled, as all that will be required will ascend from the sponge along the surface of the needles. Sufficient oil will also descend along the needles to lubricate them at their point of contact with the cams.

In building new machines the reservoirs L and slots H should be formed in the body of the machine without joint and provided with the duct M. In attaching the same to machines already in use the reservoir will be made separately and attached to the body of the machine by screws, care being taken to secure oil-tight joints. An extra gib should be used for the removal of the slides, as it keeps the sponge in position during the removal or replacement of the needles.

O is the cam for operating the needles. P is the lower side of the triangular needle-cam, and is curved, as shown, to avoid contact with the heels of the needle. This feature is not new, and does not constitute a portion of my invention.

I am aware that devices have heretofore been used for limiting the movement of the carriage and for operating the cams at various points to correspond with the number of needles being used. I do not, therefore, broadly claim the application of cam-stops adjustable with relation to the number of needles employed.

I claim as new and desire to secure by Letters Patent—

1. The bars D, constructed substantially as described, and provided with suitable means of attachment to the body of the machine, in combination with adjustable cam-stops E, substantially as shown and described.

2. The combination, with the needle-bed of the machine, of slotted chamber H, provided with fibrous absorbent charged with lubricating matter, arranged to bear against the needles, substantially as shown and described.

3. The reservoir L, spring-plate K, conducting-wick N, suitable fibrous absorbent, and slotted chamber H, arranged to operate substantially as shown and described.

VARNUM G. ARNOLD.

Witnesses:
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