

(No Model.)

2 Sheets—Sheet 1.

L. E. SALISBURY.
KNITTING MACHINE.

No. 521,248.

Patented June 12, 1894.

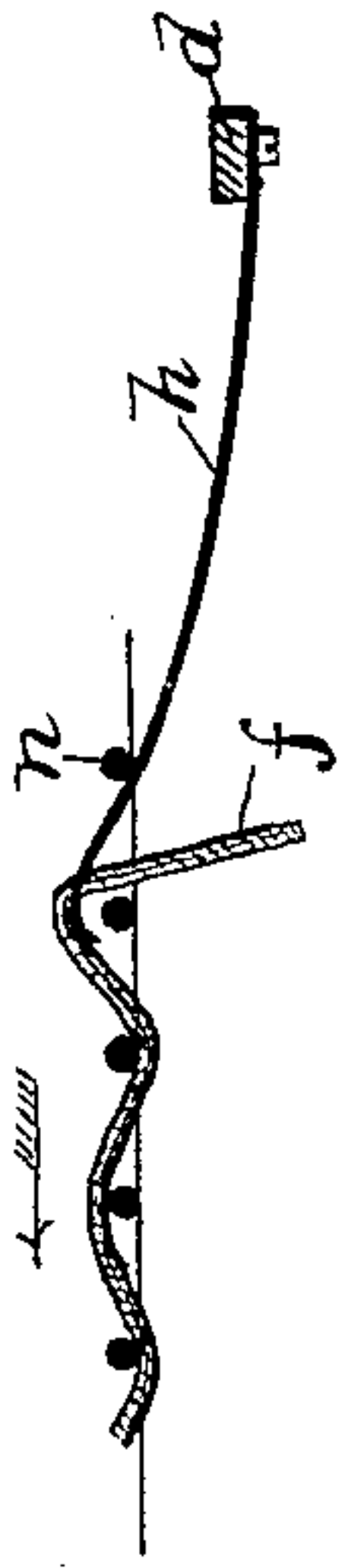


Fig. 7.

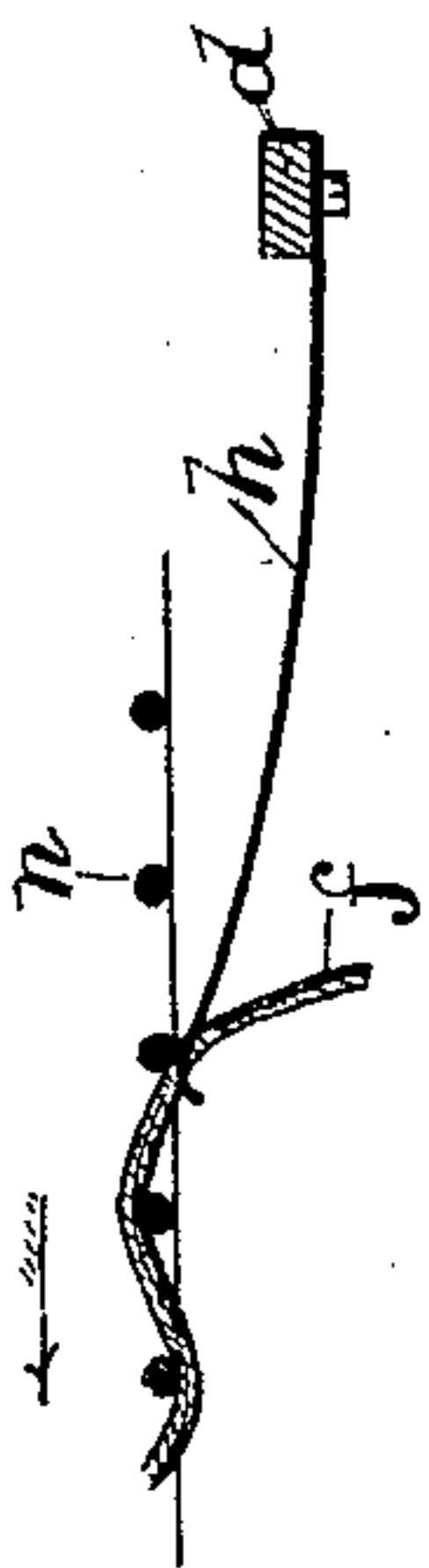


Fig. 8.

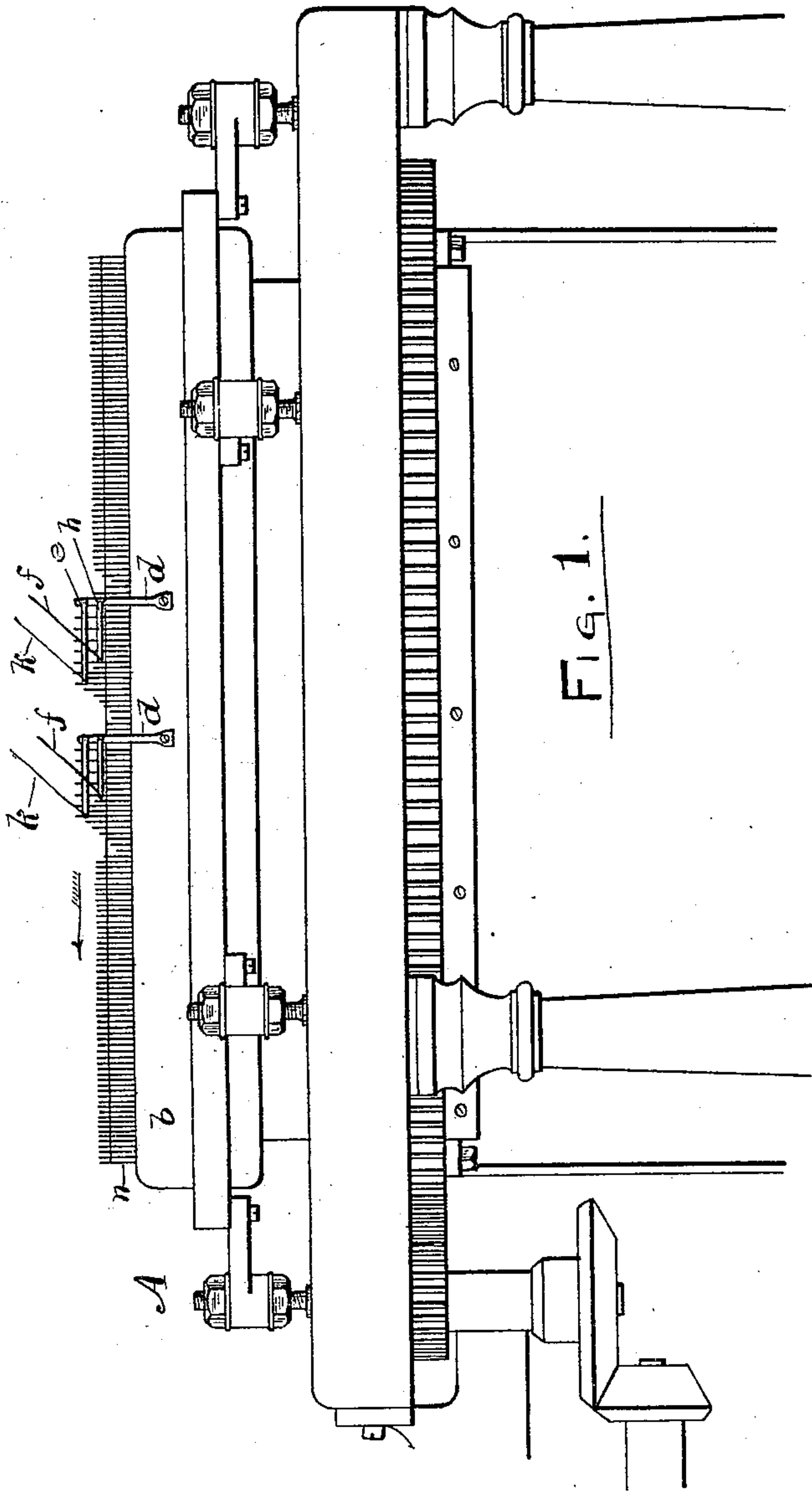


Fig. 1.

Witnesses:

Charles W. Boardman

Fred Arnold

Inventor,

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by Remington D. Henthorn
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(No Model.)

2 Sheets—Sheet 2.

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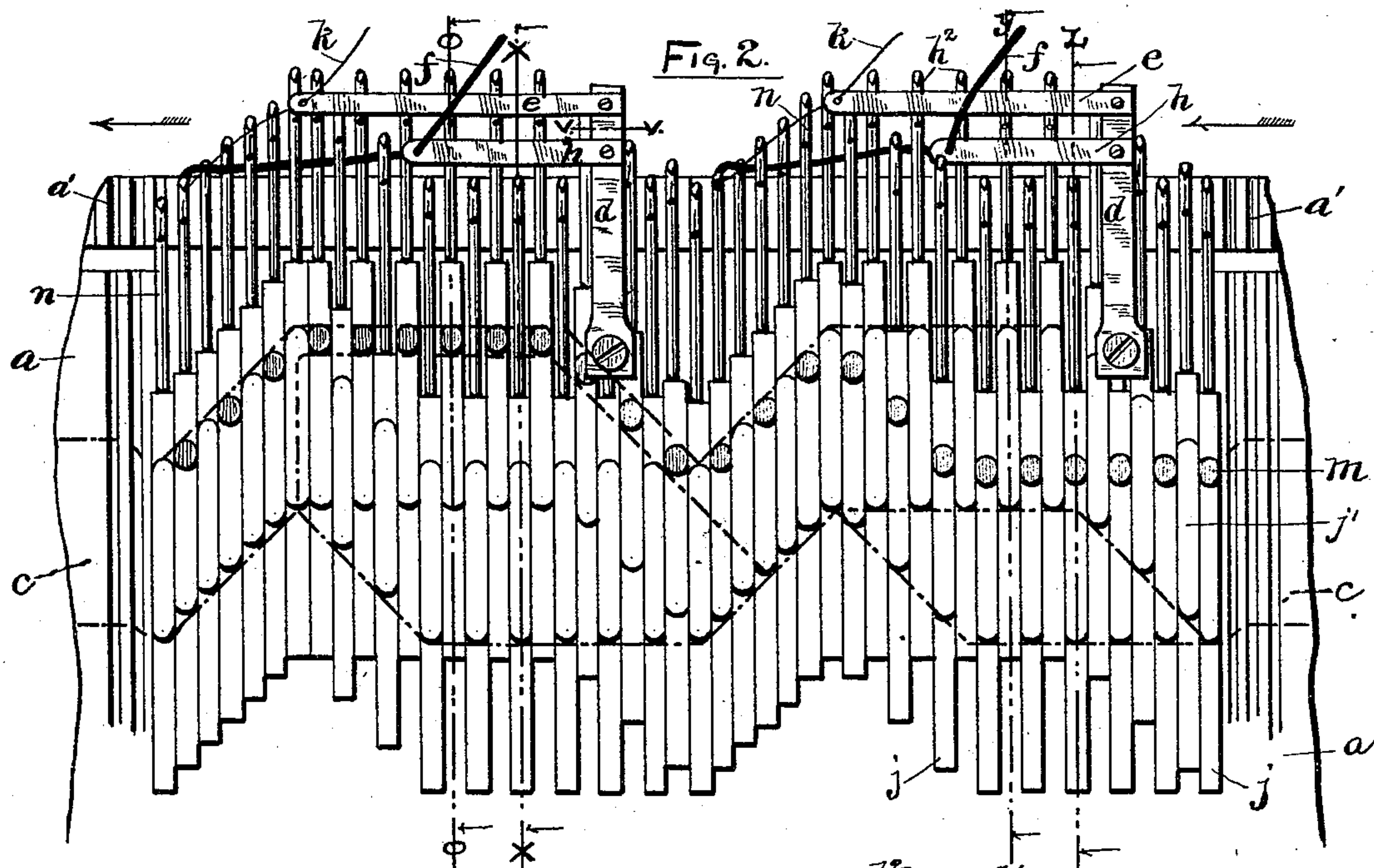


Fig. 3.

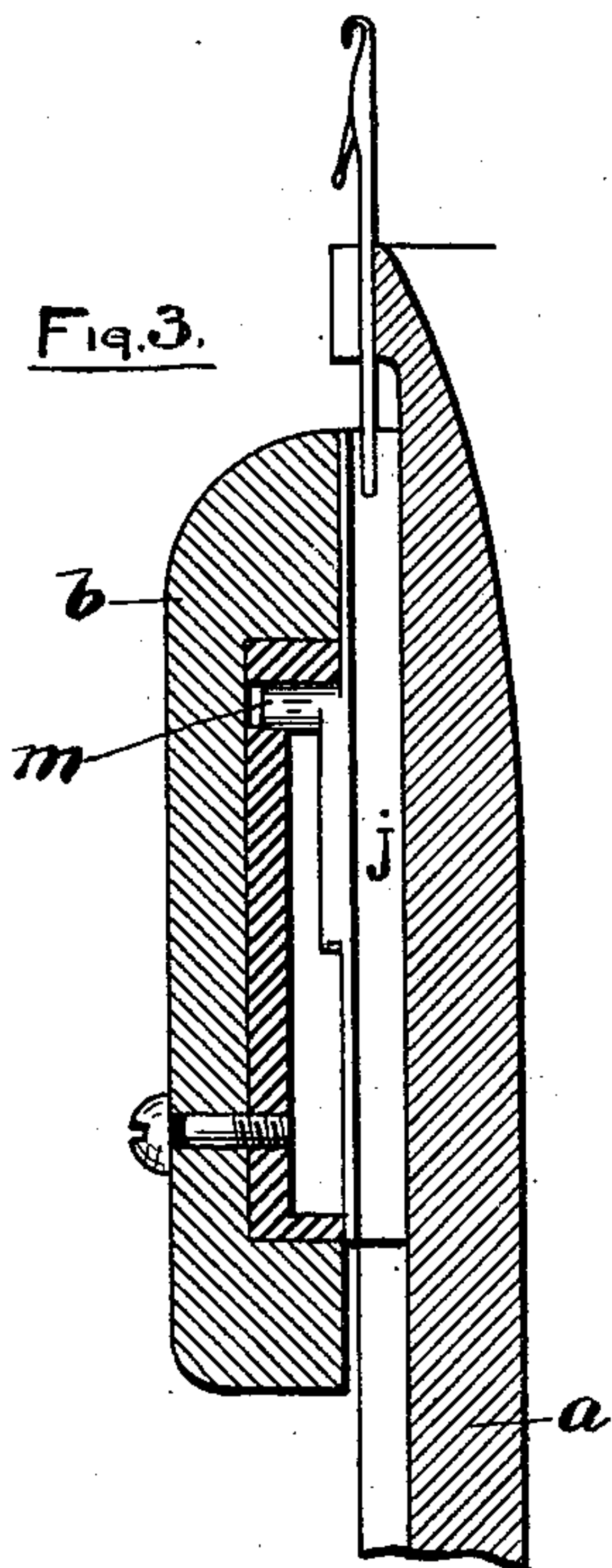


Fig. 4.

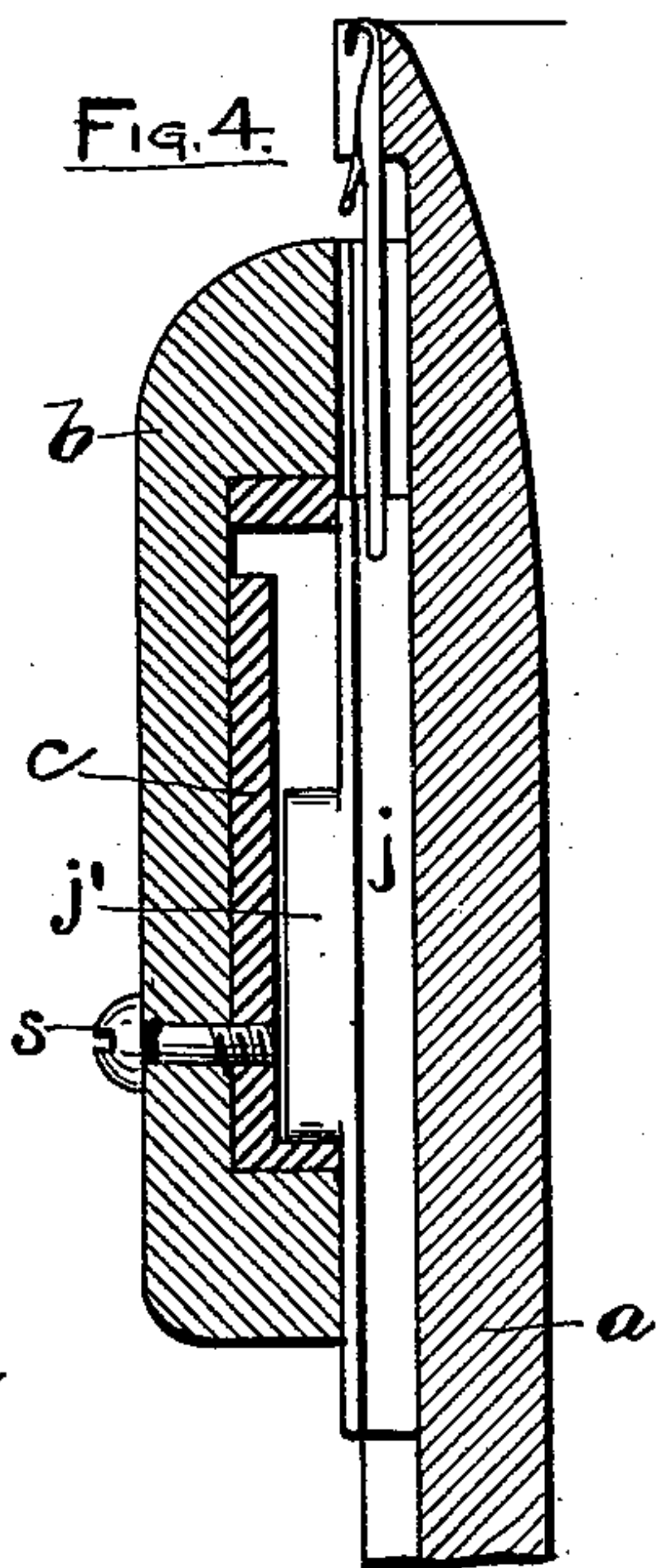


Fig. 5.

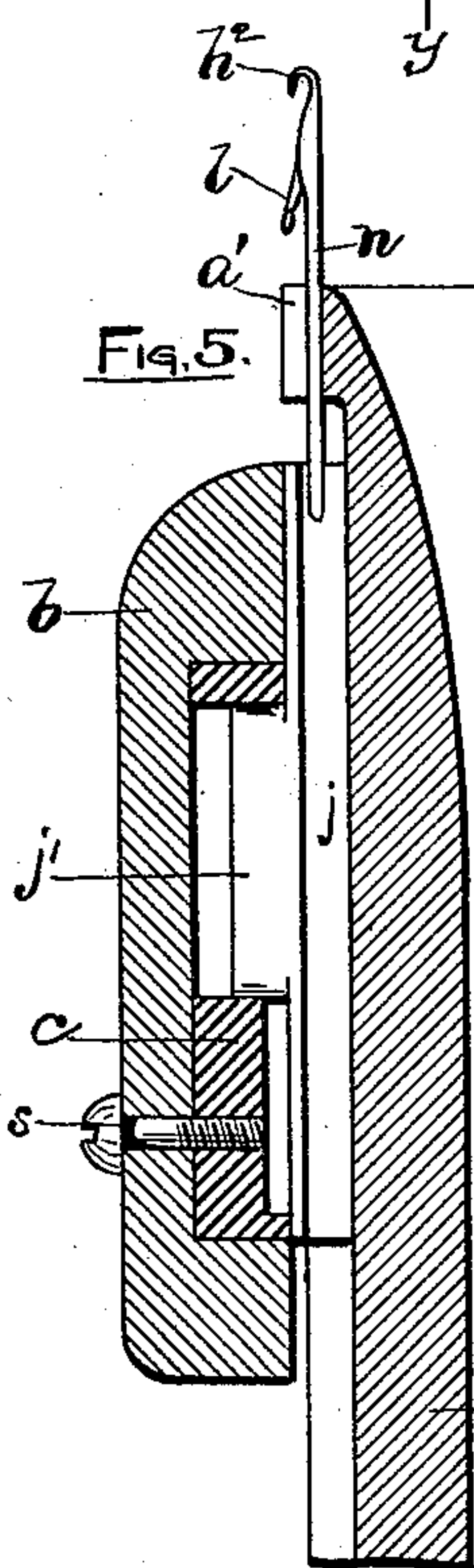
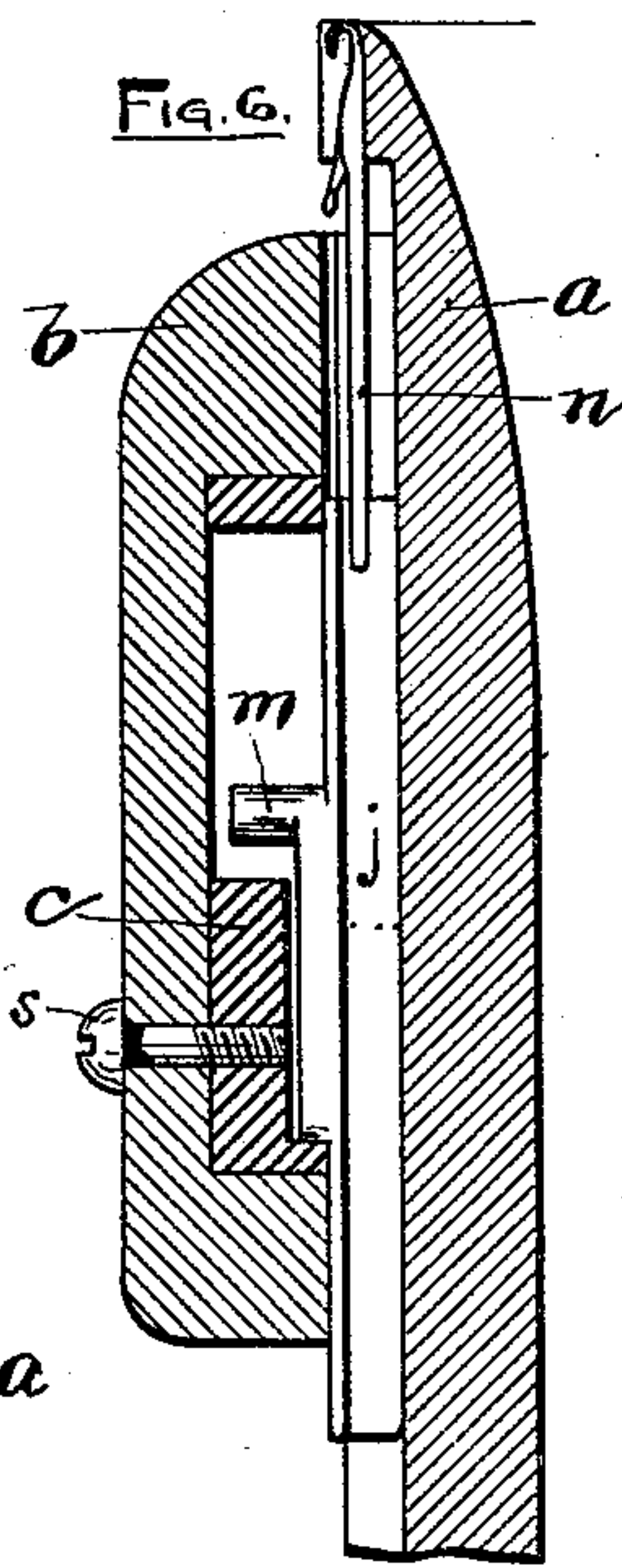


Fig. 6.



Witnesses:

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UNITED STATES PATENT OFFICE.

LEVI E. SALISBURY, OF PROVIDENCE, RHODE ISLAND.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 521,248, dated June 12, 1894.

Application filed January 6, 1894. Serial No. 495,899. (No model.)

To all whom it may concern:

Be it known that I, LEVI E. SALISBURY, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Knitting-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

In certain kinds of circular knitting machines the mechanism for actuating the needles and introducing the several threads in forming the fabric have been such that the threads are fed directly to the hooks of the needles, the latter being controlled by cams which cause the needles to rise and fall. That is to say, certain needles are made to descend below their neighbors, leaving in the more elevated positions those only to which the thread is to be presented. These needles, taking the thread in the hooks, descend, and others rise to be supplied in the same way, in case more than one weft-thread is to be used. Thus it will be seen that the needles while being carried around by the revolving cylinder are vertically reciprocated and separated as it were. A knitting machine embodying these features was patented to me February 11, 1879, No. 212,269.

In my present invention the machine, like those referred to, is adapted to produce multiple-thread fabrics, such for example, as fleece-lined goods, that is, goods in which the back is pushed or fleeced up.

My invention consists of mechanism for introducing the backing-threads to the needles and also in the novel device employed for laying said threads in position, all as will be more fully hereinafter set forth and claimed.

By means of my improvement the backing or weft-thread, passing through a yielding or flexible stationary guide, is introduced before each knitting-thread and at the back of the fabric, thus corrugating and locking or interlacing the backing-thread between the wales of the knitting-threads. The arrangement is such that the backing-thread guide

is in yielding contact with the front of the raised needles successively and below the open latch, so that as the needles pass the said guide the latter springs rearwardly and places the backing-thread in position with respect to the next needle as it rises in front of the backing-thread. Thus it will be seen that the backing-thread is guided to the front and rear of the needles alternately, without being drawn into their hooks, and left in position to be locked by the knitting-thread when the corresponding needles descend to make the stitch, after which the latter are cast off by the needles in the usual manner.

In the accompanying two sheets of drawings, Figure 1 is a partial side elevation of a circular knitting-machine provided with my improvement. Fig. 2 is a side view, enlarged, showing a portion of the cylinder and needles mounted therein; the outer frame or casing being removed. Figs. 3, 4, 5 and 6 are vertical sectional views taken on lines $o o$, $x x$, $y y$, and $z z$, respectively, of Fig. 2. Fig. 7 is a partial horizontal sectional view, enlarged, taken on line $v v$ of Fig. 2, showing the arrangement of the backing-thread guide with respect to the needles, the thread being placed in front of the needle, and Fig. 8 is a similar view, the thread being deflected to the back of the needle.

Again referring to the drawings, A indicates a knitting machine provided with my improvement. The general construction of the machine and the arrangement of its several parts, except as to the backing-thread guide and the manner of introducing such thread and timing the needles so as to work in harmony therewith, are substantially as common to machines of this class.

The cylinder a is revoluble and is provided with vertical parallel grooves a' in its periphery to receive the usual latch-needles n . Each needle is secured to a carrier or jack j , which in turn is mounted to travel up and down in said grooves, the latter being elongated for the purpose, as usual. It will be seen that I provide each alternate jack with an extension j' and each intermediate jack with a lug m . The cam c for controlling the vertical movement of the carriers j are indicated by dotted lines in Fig. 2; these cams are shaped substantially as common and are secured by

screws *s* to the outer circular casing or stationary frame *b* surrounding the cylinder, see sectional views, Figs. 3 to 6, inclusive.

Practically the machine is provided with several duplicate sets of cams, a set being employed wherever the knitting threads *k* and backing-threads *f* are introduced. These threads are conducted from any suitable source to stationary guides secured to standards or supports *d* fastened to the casing *b*, see Fig. 1. Fig. 2 shows the relation of such parts to the needles, &c., the casing, however, being omitted.

The upper or knitting-thread guide *e* is located just below and in front of the line of elevated needles, so that the thread will be seized by the hooks *h*² of the needles in their descent and converted into loops or stitches, substantially as common.

The backing or weft-thread guide *h* is secured to the standard *d*, and is mounted below and substantially parallel with the upper guide *e*. The guide *h* is shorter than the upper one and is so placed that it introduces the corresponding thread to the needles at a point just above the top of the cylinder *a*. I prefer to make the backing-thread guide of a thin piece of suitable spring metal, its forward or free end being adapted to bear lightly against the front of the elevated needles at a point below the open latches. Now, since the needles are raised and depressed alternately it follows that the action of the guide *h* will be to deliver the backing thread *f* to the front of the corresponding raised needle, as in Fig. 7; the continued rotation of the cylinder next carries said needle past the end of the guide when the latter automatically springs rearwardly and is arrested by the succeeding elevated needle; at the same time the guide carries the thread across and to the rear of the alternate or intermediate needle, the latter meanwhile being depressed and in the act of rising in front of the guide, as shown in Fig. 8. Thus it will be seen that the movements of the several parts are so timed that the backing-thread guide *h* delivers its thread in a corrugated or

zig-zag manner to the front and back of the needles alternately, and independently of the needle-hooks. This feature of my invention I find practically to be very advantageous.

While as just stated the backing-thread *f* is introduced to the front of a single raised needle at a point below its latch and then to the back of the next succeeding rising needle, and so on alternately, it is obvious that without departing from the spirit of the invention the same needles may be so set or arranged that the thread *f* is introduced to the front of two or more raised needles and then to the back of two or more succeeding rising needles.

I claim as my invention—

1. In a knitting machine, the combination with a grooved rotatable cylinder, combined needles and carriers mounted in said grooves and mechanism for alternately actuating the needles vertically, of a fixed guide for introducing the knitting-threads to the needles, and a stationary flexible backing-thread guide in yielding contact with the front of the raised needles for the purpose set forth.

2. In a knitting machine, the combination with the rotatable cylinder and needles mounted therein, of a stationary guide *e* for introducing the knitting-thread *k* to the hooks of all the needles, a stationary thread-guide *h* for introducing the backing-thread *f* to the front and back of the needles, in advance of the introduction of said thread *k*, cams for carrying the open latches of the alternate needles above the guide *h*, the hooks of the intermediate needles at the same time being maintained below said guide, cams for lifting the last-named needles after passing the guide, and cams for retracting all the needles after the hooks of the latter have received the knitting-threads, substantially as described.

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

LEVI E. SALISBURY.

Witnesses:

GEO. H. REMINGTON,
IDA M. WARREN.