

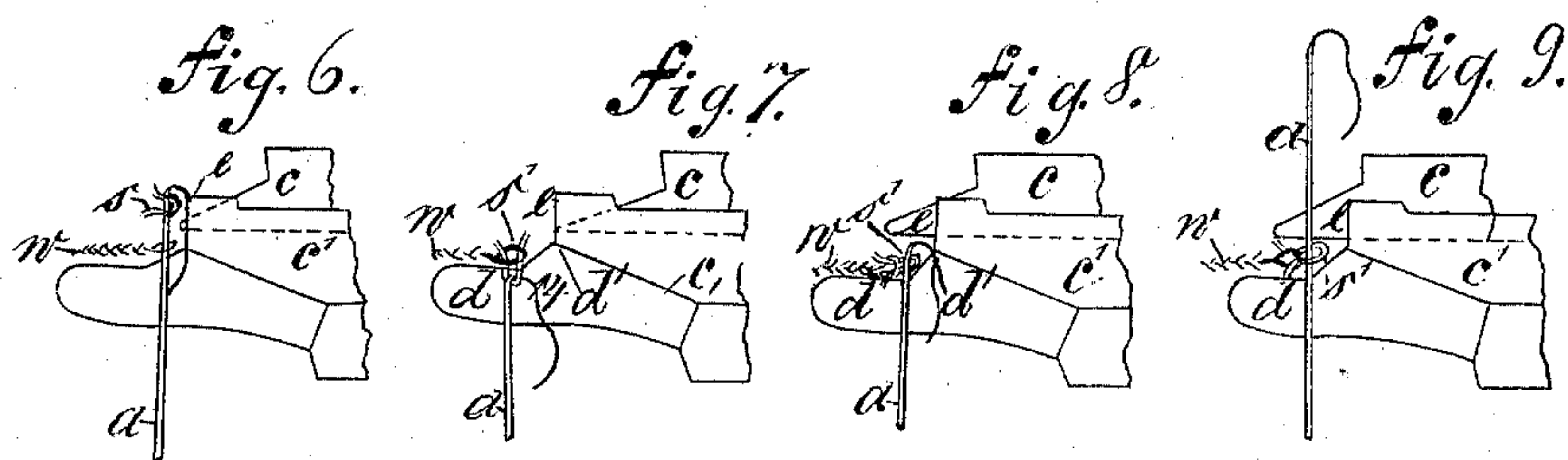
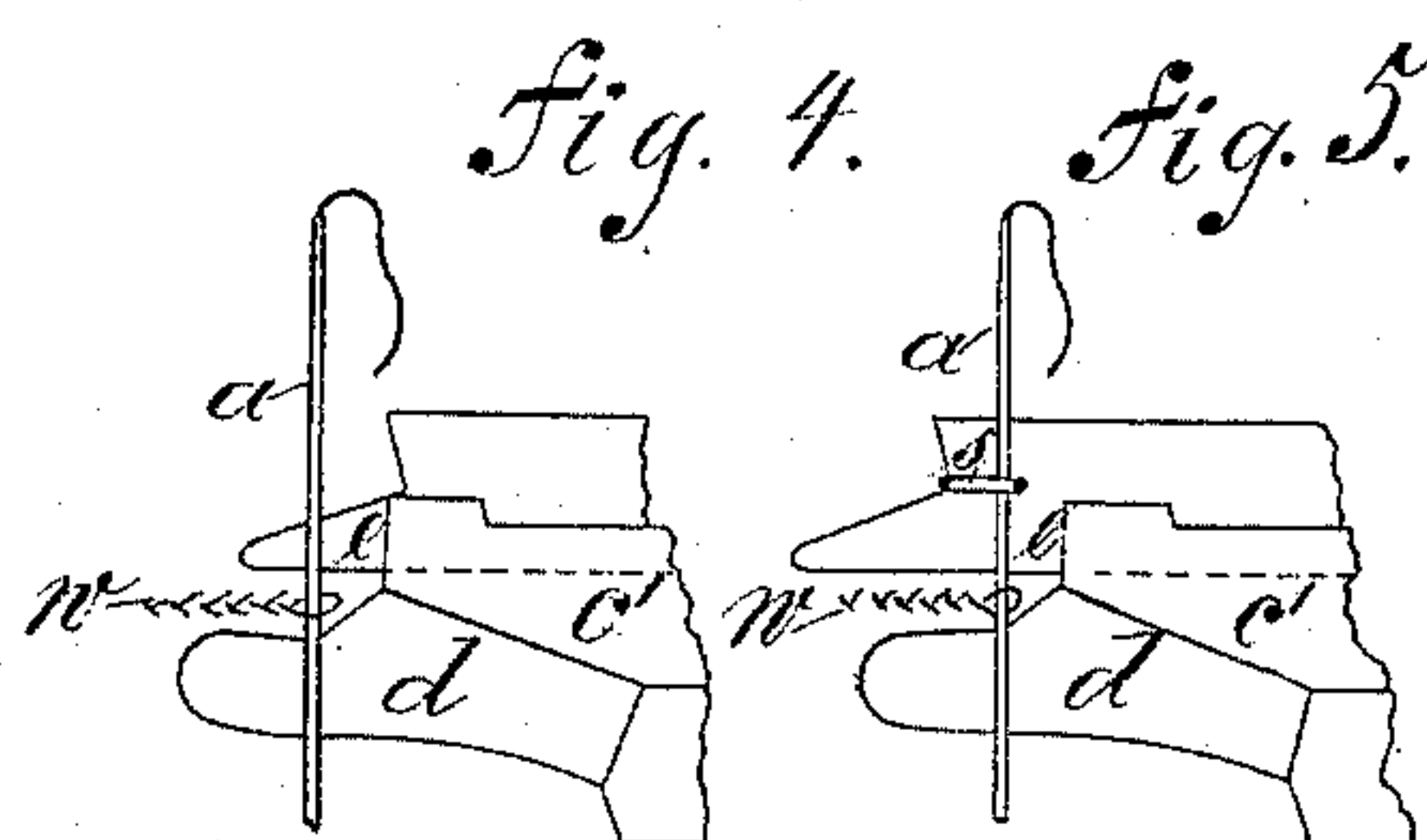
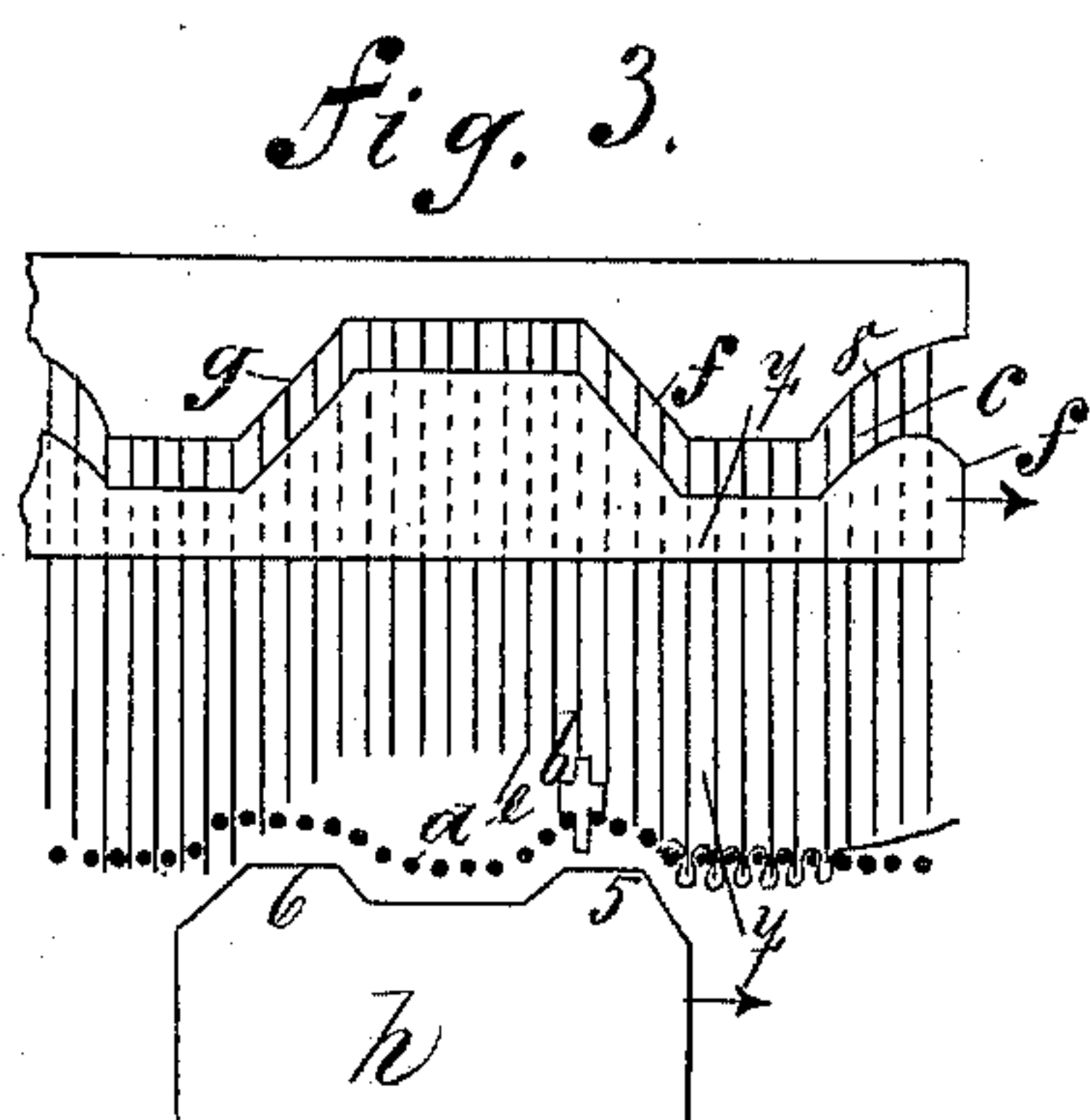
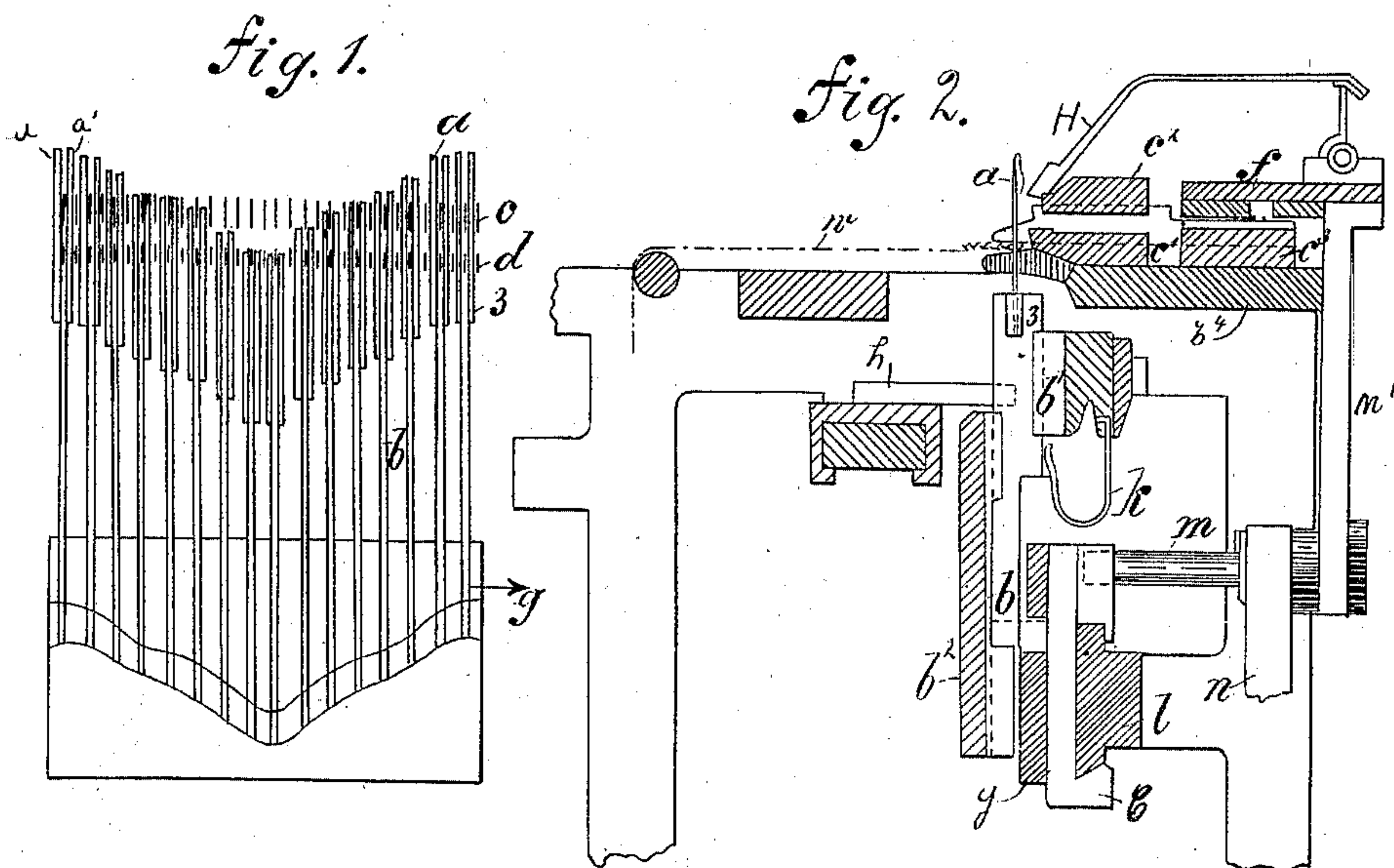
(No Model.)

2 Sheets—Sheet 1.

M. A. SEMLER.
KNITTING MACHINE.

No. 475,989.

Patented May 31, 1892.



Witnesses:

E. Wolf.
G. Taubenschmidt.

Inventor:

Max Alfred Semler
By his Atty
Whitaker & Drew.

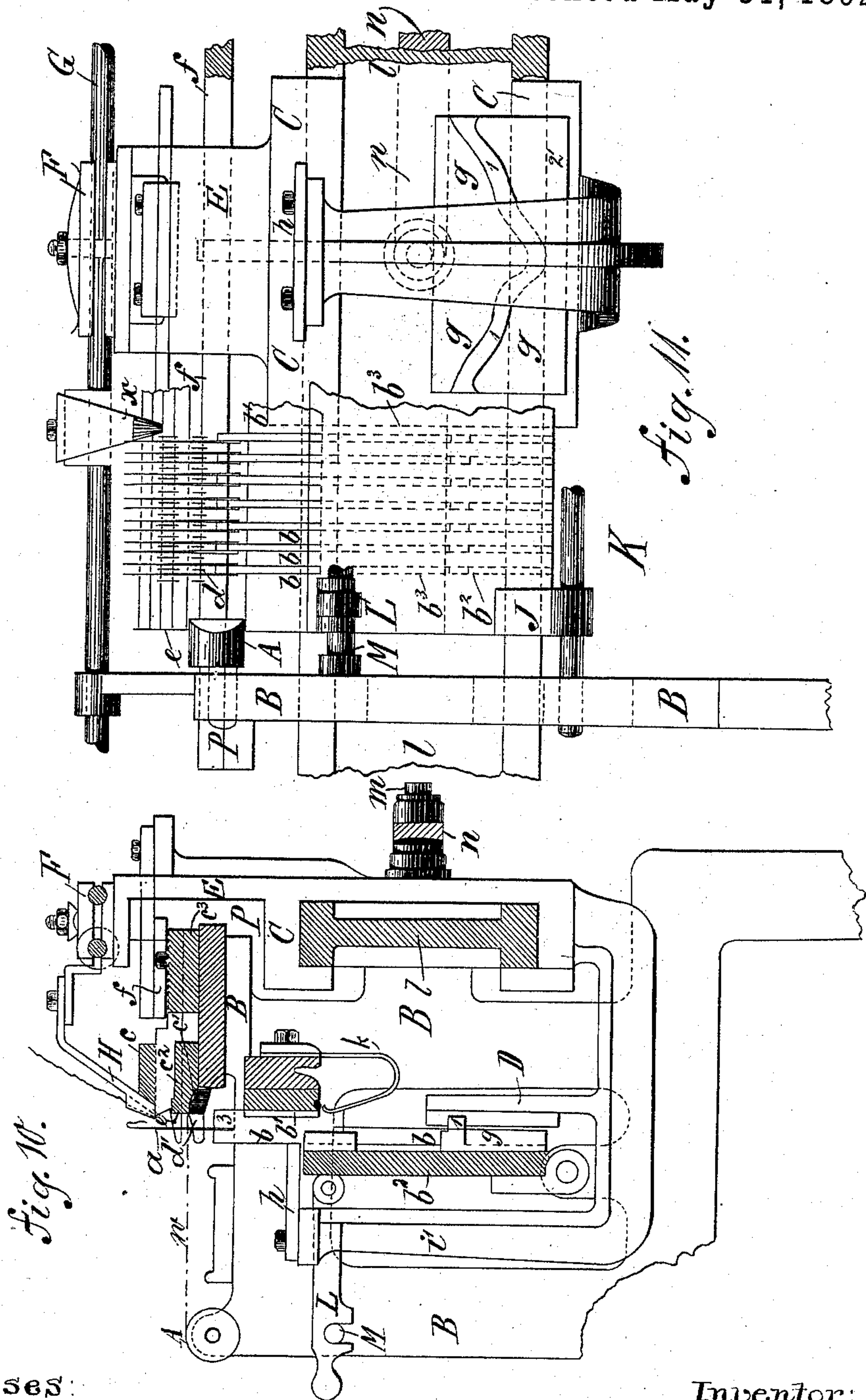
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UNITED STATES PATENT OFFICE.

MAX ALFRED SEMLER, OF KAPPEL, GERMANY.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 475,989, dated May 31, 1892.

Application filed May 13, 1891. Serial No. 392,572. (No model.) Patented in Germany July 19, 1890, No. 57,730, and in England May 2, 1891, No. 7,612.

To all whom it may concern:

Be it known that I, MAX ALFRED SEMLER, a resident of Kappel, in the Kingdom of Saxony and German Empire, have invented a new and useful Knitting-Machine, of which the following is a specification, reference being had herein to the accompanying drawings.

The invention has been patented in England May 2, 1891, No. 7,612, and in Germany July 19, 1890, No. 57,730.

The object of the invention is the production of a knitting-machine capable of working at greater speed than others of its class and which will yet be effective in its operation.

The said invention is disclosed in the following description and claims, and one form of the same is illustrated in the accompanying drawings, in which—

Figure 1 is a view in elevation of the needles as they appear in the act of loop forming and casting-off. Fig. 2 is a partial transverse section. Fig. 3 is a diagram illustrating the action of the cam giving lateral movement to the needles. Figs. 4 to 9, inclusive, are views on a larger scale showing the needle and the parts adjacent thereto in the various positions of the stitch-forming operation. Fig. 10 is a transverse sectional view, and Fig. 11 is a partial front view.

In the drawings, A is the roller for winding up the finished material as it comes from the knitting devices. This roller is operatively supported from a frame, one of the ends of which B only is shown in the drawings, and said roller may be given the requisite motion in any manner desired. This frame also supports a guide bar or rail *l*, on which the movable carriage C of the machine slides.

To the frame ends is secured a shaft K, and on this shaft is pivoted the needle-bed *b*², provided with grooves to receive the jacks of the needles. This bed is held in operative position by a latch L, which engages with the rod M, secured to the frame of the machine. The upper ends of the needle-jacks engage grooves in a part or guide *b'*, secured to the frame of the machine. The grooves in the part *b'* are of considerable depth to permit the lateral movement of the needles, as hereinafter de-

scribed, and a spring *k* is provided for each needle-jack to keep the same in place against the bottom of its groove in the needle-bed *b*². Above the part *b'* is a flat comb-bar *b*⁴, secured to the framing, having at its front stationary comb-fingers *d*, which are of the form best shown in Figs. 4 and 5. Each needle in its longitudinal or upward and downward movements passes between two of the comb-fingers. Each comb-finger is provided with the inclined portion *d'*. (See Figs. 7 and 8.) On the upper side of the comb-bar is the bed for the movable sinkers *c*, which is formed in three parts *c'*, *c*², and *c*³. The forward edge of the part *c'* between the sinker-grooves is given the faces or shoulders *e* for receiving the barbs of the needles in their downward movement to close them against the body of the needles in the usual manner. The sinkers *c* are of the form shown in Fig. 5 or of other desired form. The carriage C is provided with an upward extension E, to which is secured the thread-guide H and the sinker-cam *f*. The carriage C has secured to it an arm *i'*, which extends forwardly and then upwardly, as seen in Fig. 10, and at its top is provided with a cam-plate *h* for acting upon the needles to give them a lateral movement in the act of knitting. This plate has the edge nearest the needles of the shape shown in Fig. 3, having the cam projections 5 and 6. An upward extension D of the horizontal portion of this arm *i'* carries the grooved cam-plate *g* for engaging the nibs of the needles to reciprocate them longitudinally. The carriage C has a pin *m*, which is engaged by a link or pitman *n*, operated by a crank or eccentric (not shown) to effect the usual reciprocation of the carriage.

In the construction shown in Fig. 2 the guide bar or rail *l* is given a different location in the machine than in the construction illustrated in Figs. 10 and 11, and in this construction the sinker-cam *f* and the thread-guide are provided with a downwardly-depending arm *n'*, which is made to engage the outer end of the pin *m*; but in other respects the construction is substantially that shown in Fig. 11.

The cams and thread-guide are not described in detail, it being understood that

they may be of usual and well-known constructions suitable for producing the effects desired.

The needles are formed of a flat body or jack *b*, having at its upper end one or two needles *a a'*, Fig. 1, secured thereto. In Fig. 3 I have shown the needles diagrammatically, and at *b* I have shown a single needle-jack as it would appear when looking down upon it and its attached needles.

In the operation of knitting the thread is laid against or in rear of the needles. The sinkers are then operated and the thread forced forward against the needles and carried forward between them, as shown in Figs. 3 and 5. The cam *g* next acts, drawing down the needles until the point of the barb has passed over the thread. The cam *h* then forces the needles backward, the sinkers are drawn backward, and, the cam *g* continuing to draw the needles down, the barb comes in contact with the shoulder *e* and is closed upon the body of the needle and passes down through the loops previously formed. In doing this the knitted fabric is drawn against the inclined portions *d'* of the stationary fingers of the comb and is forced forward and away from the needles, so that as the needles rise they clear the fabric. As the needles rise the sinkers are again moved forward over the fabric, holding it down against the upward drag of the needles. By this construction the forcing of the barb to one side of the needle in the act of closing is avoided and a

frequent cause of faults in knitting removed. The necessity of tension on the fabric during knitting is also avoided. The roll may therefore be employed to take up the fabric as knitted without drawing on the needles, so that a fabric can be produced without depriving it of any of its elasticity.

What I desire to claim and secure by Letters Patent is—

1. The combination herein described of a series of needles, a cam for reciprocating said needles, and a cam engaging said needles to give them a lateral movement.

2. The herein-described combination of a series of barbed needles, stationary barb-engaging shoulders, a cam for reciprocating the needles, and a cam engaging said needles to force them toward said shoulders to effect the closing of said barbs.

3. The herein-described combination of the series of needles, the stationary comb having inclines, the movable sinkers, and a cam for actuating said needles.

4. The herein-described combination of a series of needles, the grooved needle-bed, the grooved guide, the springs, the cam for reciprocating the needles, and the cam for forcing the needles against the said springs.

In witness whereof I have hereunto set my hand in presence of two witnesses.

MAX ALFRED SEMLER.

Witnesses:

H. A. DE SOTO,
R. E. JAHN.