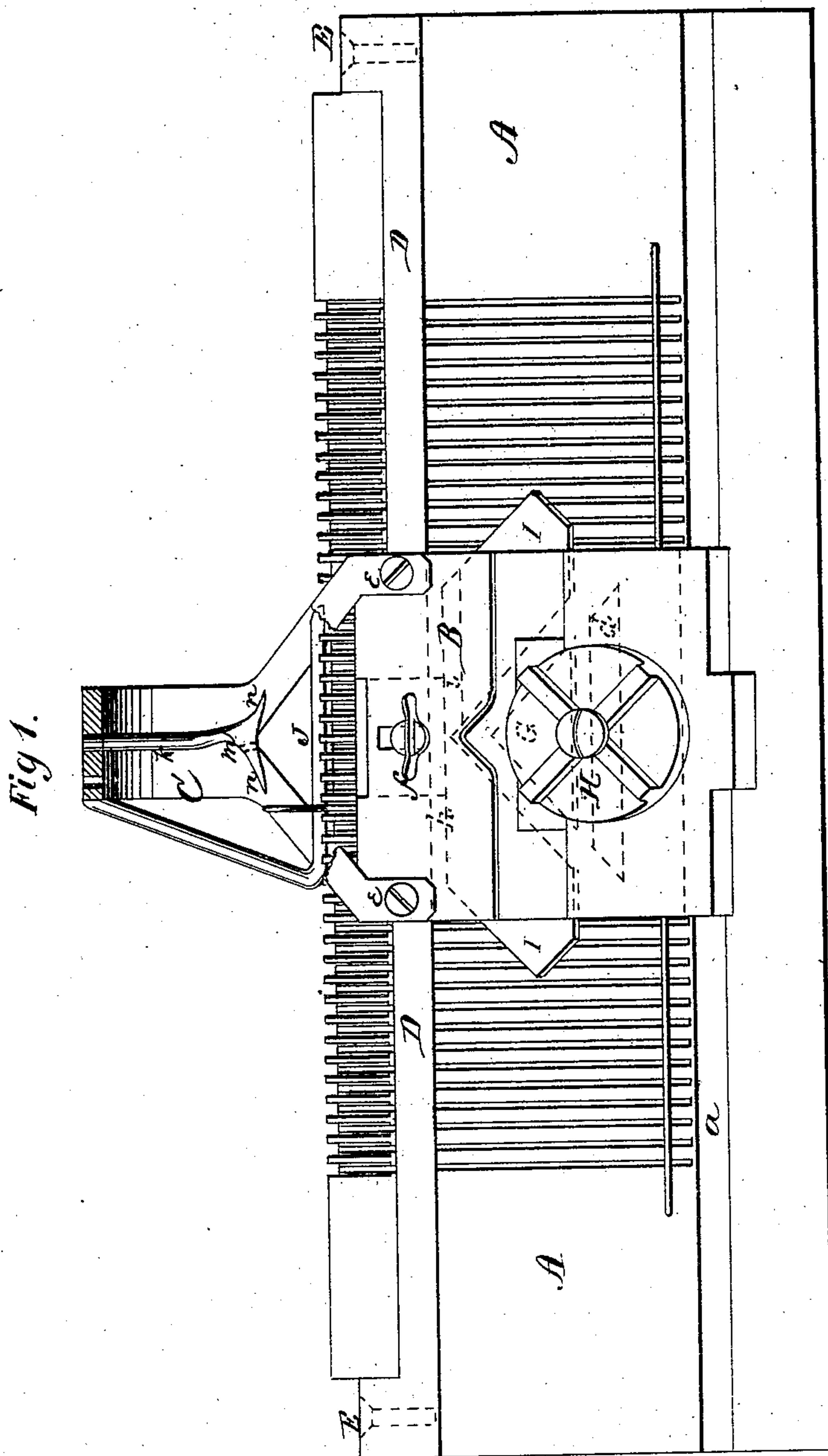


**J. LEONARD.**  
**Knitting-Machines.**

No. 153,093.

Patented July 14, 1874.



**WITNESSES.**

*J. P. Theodore Lang.*  
*C. L. Ewert*

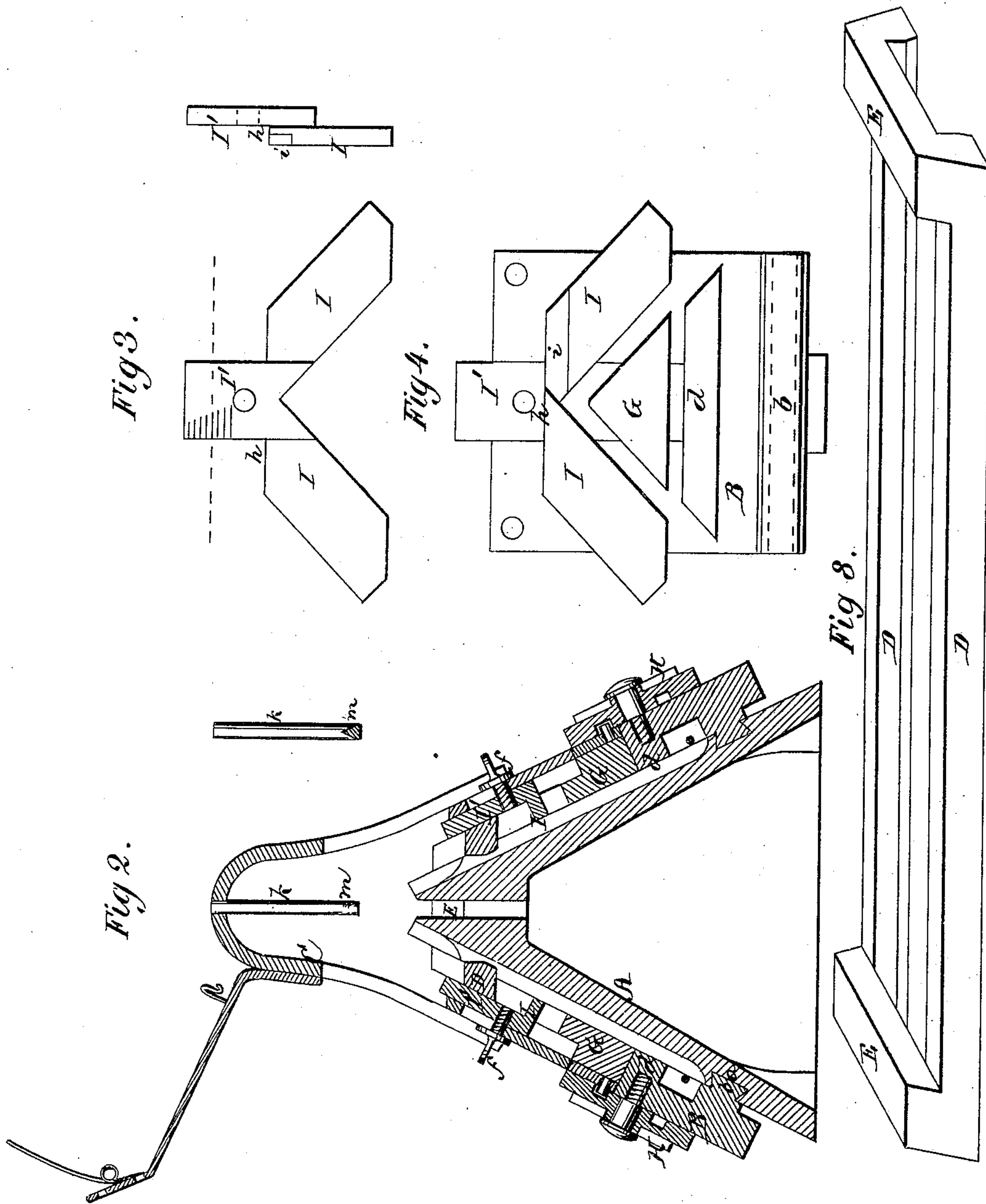
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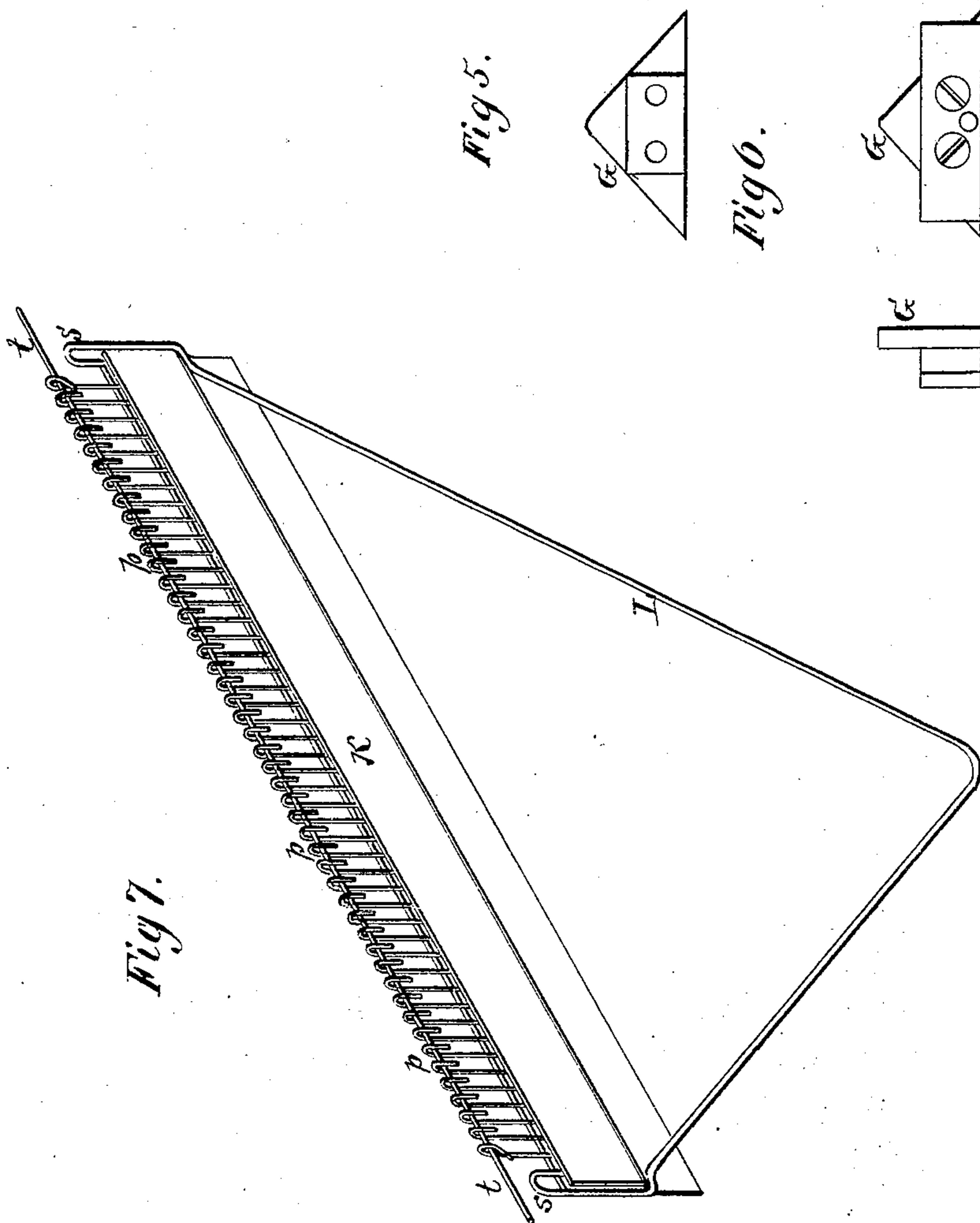
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# UNITED STATES PATENT OFFICE.

JONATHAN LEONARD, OF NORWALK, OHIO.

## IMPROVEMENT IN KNITTING-MACHINES.

Specification forming part of Letters Patent No. **153,093**, dated July 14, 1874; application filed May 16, 1874.

*To all whom it may concern :*

Be it known that I, JONATHAN LEONARD, of Norwalk, in the county of Huron and in the State of Ohio, have invented certain new and useful Improvements in Knitting-Machines; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon, making a part of this specification.

My present invention is intended as an improvement upon the knitting-machine for which Letters Patent No. 135,823 were granted to me February 11, 1873; and the nature of my invention consists in the construction of the needle-bed with dovetailed grooves to receive the sliding plates, and with grooves and shoulders at the top to receive the confining-band; also, in the construction of the cams used for operating the needles. My invention further consists in the construction of the reed for setting up the work, all as hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a side elevation of a knitting-machine embodying my improvements. Fig. 2 is a transverse vertical section of the same. Fig. 3 is a view of the double cam. Fig. 4 is an inside view of one of the sliding plates, showing all the cams thereon. Figs. 5 and 6 show the movable cam. Fig. 7 is a perspective view of the setting-up reed. Fig. 8 is a perspective view of the loop around the upper part of the needle-bed.

A represents the needle-bed of the knitting-machine, constructed substantially in the same manner as is usual in this class of machines, with inclined sides having a slot or opening between their upper edges, and a series of parallel needle-grooves on each side. A suitable distance above the bottom edge in each side of the bed is a dovetailed groove, *a*, running the entire length of the bed, and in this groove is placed a dovetailed slide, *b*, formed on or attached to the inner side of a plate, *B*, whereby said plates are held firmly and closely to the bed, but, nevertheless, allowed to

slide freely back and forth on the bed. The plates *B B* are connected by means of an arch, *C*, the ends of which are forked and the prongs secured to the upper corners of the plates by means of screws or bolts *e e*. In the upper part of the bed, and each side, is a longitudinal groove or offset, with a suitable offset on each end for the reception of a band, which is formed of two bars, *D D*, connected by cross-bars *E E* at the ends, all made in one piece, as shown in Fig. 8. Upon the inner side of each plate *B*, a suitable distance above the dovetailed slide *b*, is formed or secured a cam or bar, *d*, the upper and lower sides of which are parallel and horizontal, and the ends inclined upward and inward at an angle of about forty-five degrees, as shown in Fig. 4. Above this cam is a triangular cam, *G*, moved up and down by means of the wheel *H* and the latches, as fully described in my former patent above referred to. When the cam *G* is down upon the cam *d* the needles will be moved up by said cams to knit, and are drawn down by the double cam *I*. When the cam *G* is raised up above the cam *d* the needles will be elevated simply the height of the cam *d*, and the needle-heels pass between the two cams, and thus not be elevated far enough to perform any knitting. The double cam *I* is cast of one piece, forming two inclined bars coming together at the top, the angle between them corresponding with the angle of the cam *G*, and cast with a plate, *I'*, which is let into a recess in the inner side of the sliding plate *B* and fastened by means of a set-screw, *f*. This screw passes through a vertical slot in the plate *B*, so that the double cam may be adjusted up and down as required. The upper edge *h* of the double cam *I* is horizontal, so that any one or more needles may be raised above said cam, and then loops pass along this horizontal edge without performing any knitting, which is of advantage in producing the heel of a stocking or other similar work. In the upper edge of one of the bars forming the double cam is a groove, *i*, through which the needle-heels may be passed to draw them down into operation when desired. During ordinary knitting the double cam *I* draws the needles down after they have been raised by the cams *d G*. On the side of the plate *I'* is



a scale, as shown in Fig. 3, to facilitate the proper adjustment of the double cam. From the center of the arch C projects an arm, *k*, vertically, downward, which arm has upon its lower end a foot or guide, *m*, through which the yarn passes. This guide forms a point, *n*, at each end for lowering the latches on the needles during the movement of the sliding plates in either direction. From the arch C also projects another arm, the lower end of which is bent horizontally, forming the presser-foot J to hold the work down and prevent its rising by the movement of the needles. This presser-foot is made of sufficient length to project a certain distance on both sides of the point where the stitch is being made, and it is triangular in its cross-section, the inclination of its sides corresponding with the inclination of the sides of the bed and upon a line with the bottoms of the needle-grooves, so that the needles will pass upon the same and be supported thereby. The reed for setting up work is composed of a series of vertical wire hooks, *p p*, secured in a metal bar, K, and provided with the usual triangular handle L. At each end of the bar K is a hook or loop, *s*, through which pins are to be inserted for supporting the reed upon the upper edge of the needle-bed, when the reed is passed down in the usual manner through the central opening therein. Through the wire hooks *p p* is passed and held a rod, *t*, under which the stitches are formed in setting up the work, and which rod facilitates the setting up, and makes the stitches uniform

and in a perfectly straight line. When the work is completed it is only necessary to pull out the rod *t*, when the reed will be at once disengaged therefrom. The hooks *p p*, therefore, only serve to hold the rod *t* in place.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The needle-bed A, provided with dovetailed grooves *a a*, and with shoulders or off-sets, as described, in combination with the sliding plates B B, having dovetailed slides *b b*, and the band D E, all constructed substantially as and for the purposes herein set forth.

2. The combination, with the stationary cam *d* and the triangular movable cam G, of the two inclined cams I I, one of which is provided with the horizontal groove *i*, the upper edges of both cams being horizontal, and both connected to and adjusted up and down by the bar I', all substantially as and for the purposes set forth.

3. The reed K L *p t*, provided with the loops S S on each end, as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 12th day of May, 1874.

JONATHAN LEONARD.

Witnesses:

C. L. EVERT,

W. T. JOHNSON.