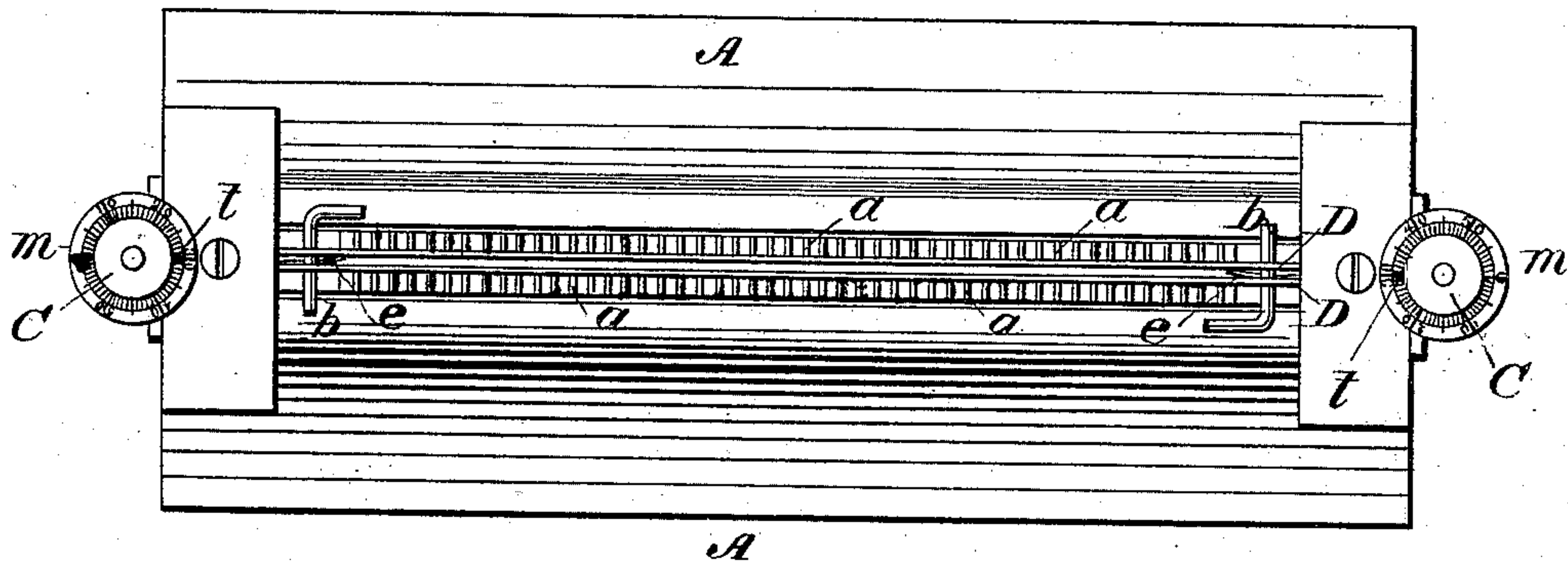


H. GUNTHER.  
Knitting-Machine.

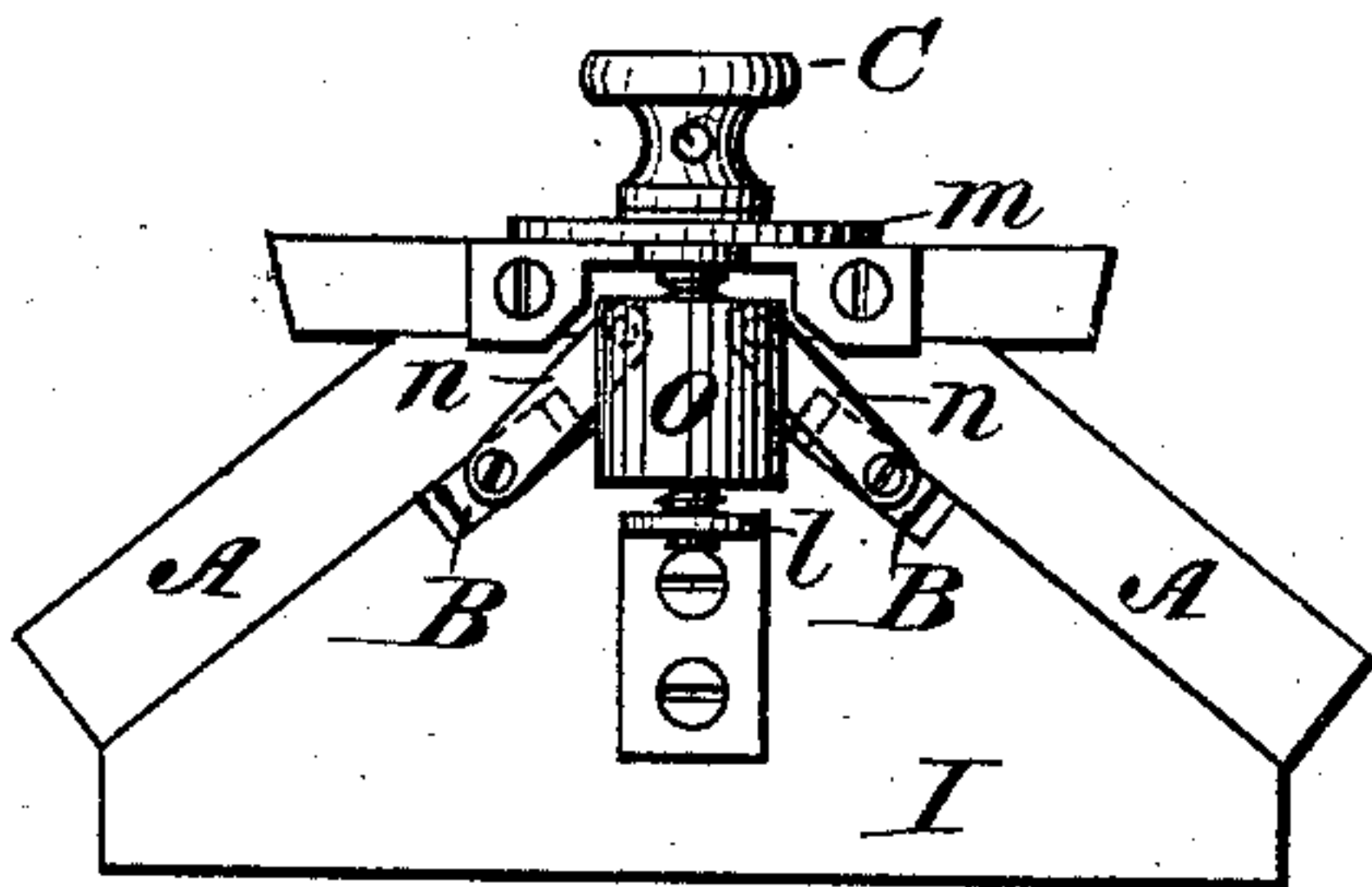
No. 217,530.

Patented July 15, 1879.

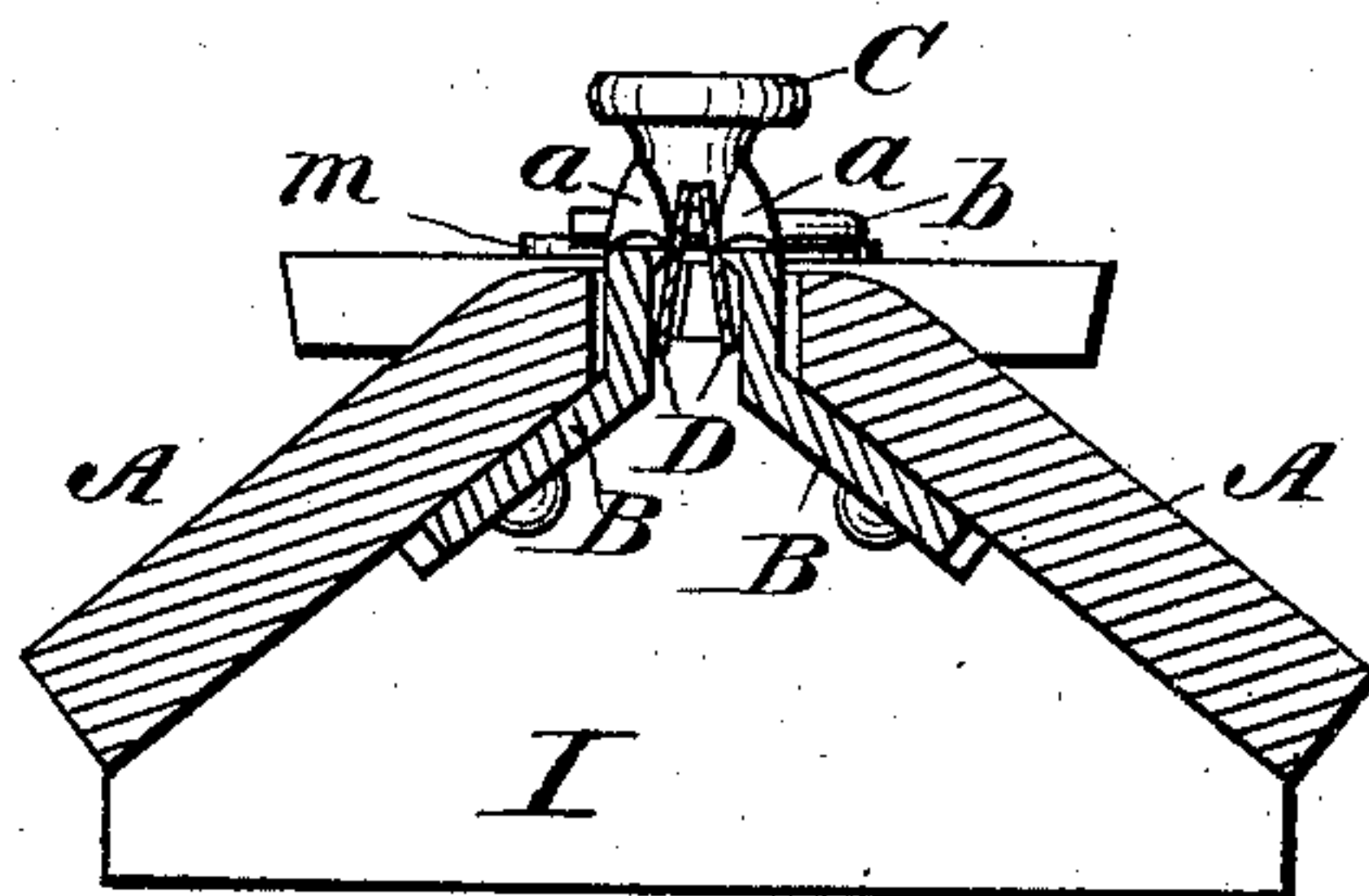
*Fig. 1*



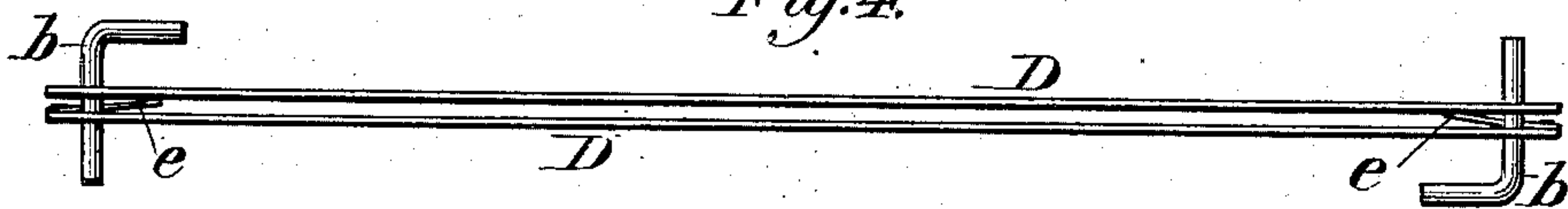
*Fig. 2*



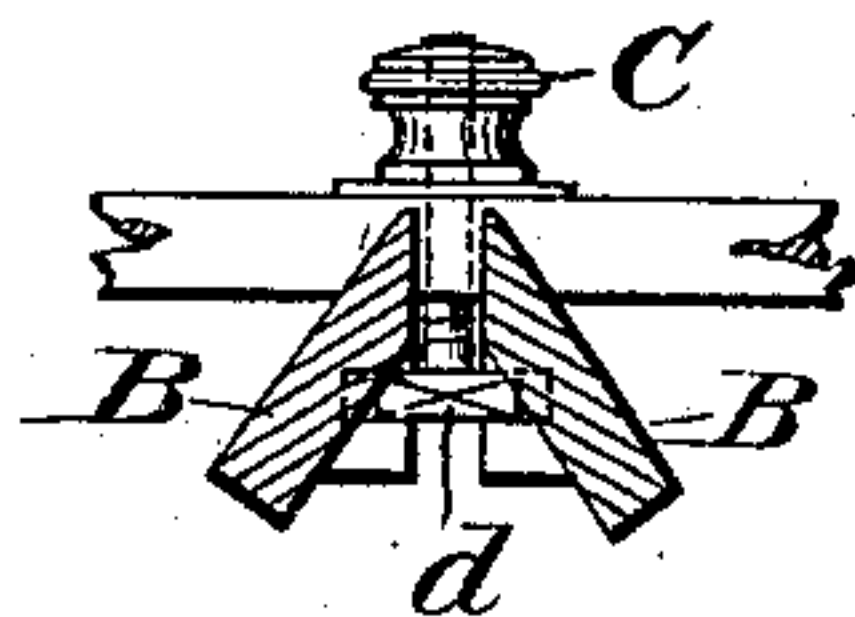
*Fig. 3*



*Fig. 4*



*Fig. 5*



Witnesses:

Donn J. Twitchell.  
William N. Dodge.

Inventor:

Hugo Gunther.  
by Dodge & Son,  
Atty.

# UNITED STATES PATENT OFFICE.

HUGO GÜNTHER, OF LEIPSIC, ASSIGNOR TO F. A. ST. BIERNATZKI, OF  
HAMBURG, GERMANY.

## IMPROVEMENT IN KNITTING-MACHINES.

Specification forming part of Letters Patent No. **217,530**, dated July 15, 1879; application filed  
May 12, 1879.

*To all whom it may concern:*

Be it known that I, HUGO GÜNTHER, of Leipsic, in the German Empire, have invented certain Improvements in Knitting-Machines, of which the following is a specification, reference being had to the accompanying drawings, like letters indicating like parts in the several figures.

My invention relates to that class of machines known as "straight-knitting" machines; and the invention consists in providing means or mechanism by which the jack-bars can be simultaneously and quickly adjusted, so as to make the throat wider or narrower, and thus knit the fabric looser or closer, and in providing the adjusting device with an indicator as a guide for the adjustment of the jack-bars.

It also further consists in the combination, with these adjustable jack-bars, of a pair of facing-plates, all as hereinafter more fully set forth.

Figure 1 is a top-plan view. Fig. 2 is an end elevation. Figs. 3 and 5 are transverse vertical sections of my improved machine; and Fig. 4 is a top-plan view of the facing-plates. (Shown detached.)

As ordinarily constructed, this class of machines, of which the Lamb knitting-machine is a type, have their frame or needle beds composed of two plates or bars arranged opposite each other, after the form of the letter **A**, with transverse grooves for the needles cut in their upper surfaces, the needles being operated by cams carried by a reciprocating frame, which, with the needles, are not shown in the drawings, as they form no part of the present invention.

In these machines the jack-bars **B**, which support the jacks *a*, (see Figs. 1 and 3,) are usually secured rigidly at the inner edge of the bed-plates **A**, one on each side, with a space between them, through which the fabric as it is knit is drawn, and thus it happens that this space or throat is of a fixed or permanent width, and cannot be varied after the machine is completed. In order to obviate this, the jack-bars have been secured to the bed-plate or frame by means of set-screws passing through slots in the jack-bars; but as

this required the loosening of all the screws, and the adjusting of the bars by hand, and the tightening of the screws again, and as it required much care and time to get the separate bars adjusted with accuracy and uniformity, this plan is seldom if ever used in practice. It is therefore customary to make this throat of a width corresponding with the number of needles per inch used in a machine, it being narrower for those using more needles for fine work, and wider for those having less needles per inch for coarse work. In the knitting of ribbed fabric, where the loops or stitches extend across the throat from one side to the other, it follows that the size of the stitch and the consequent looseness of the fabric will depend upon the width of the throat or the distance that the jack-bars are apart.

In the Lamb machine provision is made for varying the size of the stitch to a certain extent by shifting the ring-cams up or down, but that will only determine the length of the stitch that is being drawn through the loop previously formed; but the fabric will still be loose because of the length of yarn required to reach across the throat from one jack-bar to the other. To remedy this difficulty, and enable the machine to be readily adjusted so as to make the fabric close or loose at will, I make the jack-bars **B** movable, so they can be adjusted and brought nearer together or farther apart whenever desired, thus making the throat narrower or wider, and thereby decreasing or increasing the length of yarn required to reach across from side to side, and consequently making the fabric close or loose at will.

This adjustment of the jack-bars may be effected in a variety of ways. In Fig. 2 the bars **B** are shown resting in slots in the cross-bars or end pieces **I** of the needle bed or frame, and are connected at their ends by a link, *n*, to a nut, **O**, through which a vertical thumb-screw, **C**, passes, its lower end being stepped or supported in a stationary bracket or bearing, **l**, so that by turning the screw **C** in one direction the nut **O** will be raised, and by means of the links *n* will also draw the jack-bars along the under inclined side of the bed-



plates A, thereby causing them to approach each other, and thus narrowing the throat or space between the bars to any desired extent. By reversing the movement of the screws C the bars will be separated and the throat widened, and thus the machine may be easily and quickly adjusted to make the fabric close or loose at will.

In Fig. 5 another plan is shown for moving the bars B. In this the screw C is shown entering a hole in a small cross-bar, *d*, the ends of which engage in recesses in the bars B, so that, by turning the screw, the bars can be adjusted, as before described.

As shown in Fig. 3, the bars B may be secured to the under side of the bed-plates A by means of screws passing through slots in the bars B, which will cause them to move in a true line and keep their edges parallel.

As shown in Fig. 1, I provide a graduated dial-plate, *m*, at each end, through the center of which the screw C passes, and secured to the screw is a pointer or index, *t*, which, as the screw is turned, is made to traverse the face of the dial-plate, thus affording means for adjusting the bars B alike at both ends, and for setting them at any point desired.

By causing the bars B to move on an incline, as shown, they are made to rise as they advance, thus causing them to move on a line parallel with the needles, and retain the same relative position to the needles, as is necessary in order to have the machine operate perfectly.

In order to secure the proper casting off of the work with these adjustable jack-bars, I provide two thin steel plates, D. (Shown detached in Fig. 4 and in position in Fig. 3.) To the inner side of one or both of these plates D is secured a flat spring, *e*, as shown in Fig. 4, so arranged as to press the plates apart. Through each end of the plates D is made a hole, through which is inserted a pin, *b*, as shown. When it is desired to use these stripping or facing plates D they are simply inserted in the throat between the jack-bars B, where they are supported by the projecting ends of the pins *b* resting on the top of the bars B, care being taken to make the holes for the pins in such a position as will serve to bring the upper edge of the plates D at the required height when inserted between the jack-bars, as described.

It is obvious that these plates D may be supported by other means, and operate the same.

In machines which have the jacks made as represented in the drawings, and in which the horizontal wire passing through the row

of jacks, as in the Lamb machine, is omitted, these stripper-plates serve materially to assist in casting off the work. In addition to this their use is specially desirable when it is desired to produce very close-ribbed work, as in such case it is an object to have the stitch begin to cast off from the bottom of the loop full as soon, if not sooner, than at the sides, and that the plates do as the stitch is drawn across their upper edges as the needles recede, the plates thus operating to cast off the stitch from the under side as soon as at the sides. In making plain tubular work the opposite of this is best—that is to say, the stitch should draw off from the sides of the needles, and, as this is effected by the jacks, the stripper-plates are not used, except for the production of ribbed fabric.

By these improvements it will be seen that the length of thread required to reach across the throat may be varied at will, and as by shifting the ring-cams the length of the stitch that is being drawn through the previously-formed loop can also be regulated or varied, as previously described, it follows that by these two means, the adjustable jack-bars and the adjustable wing-cams, the coarseness or fineness of the knitting can be varied to a much greater extent than by either alone, and thus a machine provided with these features is rendered capable of varying the looseness or closeness of its work to a great extent, even while using the same yarn.

Having thus described my invention, what I claim is—

1. In combination with the needle-bed A, the adjustable jack-bars B and adjusting-screws C, connected to the bars B by the nut O and links *n*, or equivalent devices, substantially as and for the purpose set forth.

2. In combination with the adjustable jack-bars B, the adjusting-screws C, connected to the bars by nut O and links *n*, or equivalent devices, and provided with an index or pointer, *t*, arranged to operate in connection with the graduated dial-plate *m*, whereby the jack-bars can be quickly adjusted and set at any desired point, as set forth.

3. The detachable stripper-plates D, provided with the springs *e* and pins *b*, or equivalent devices, in combination with the adjustable jack-bars B, said parts being constructed and arranged to operate substantially as described.

HUGO GÜNTHER.

Witnesses:

CARL VOIGT,

FRIEDERICH WILHELM FABIAN.