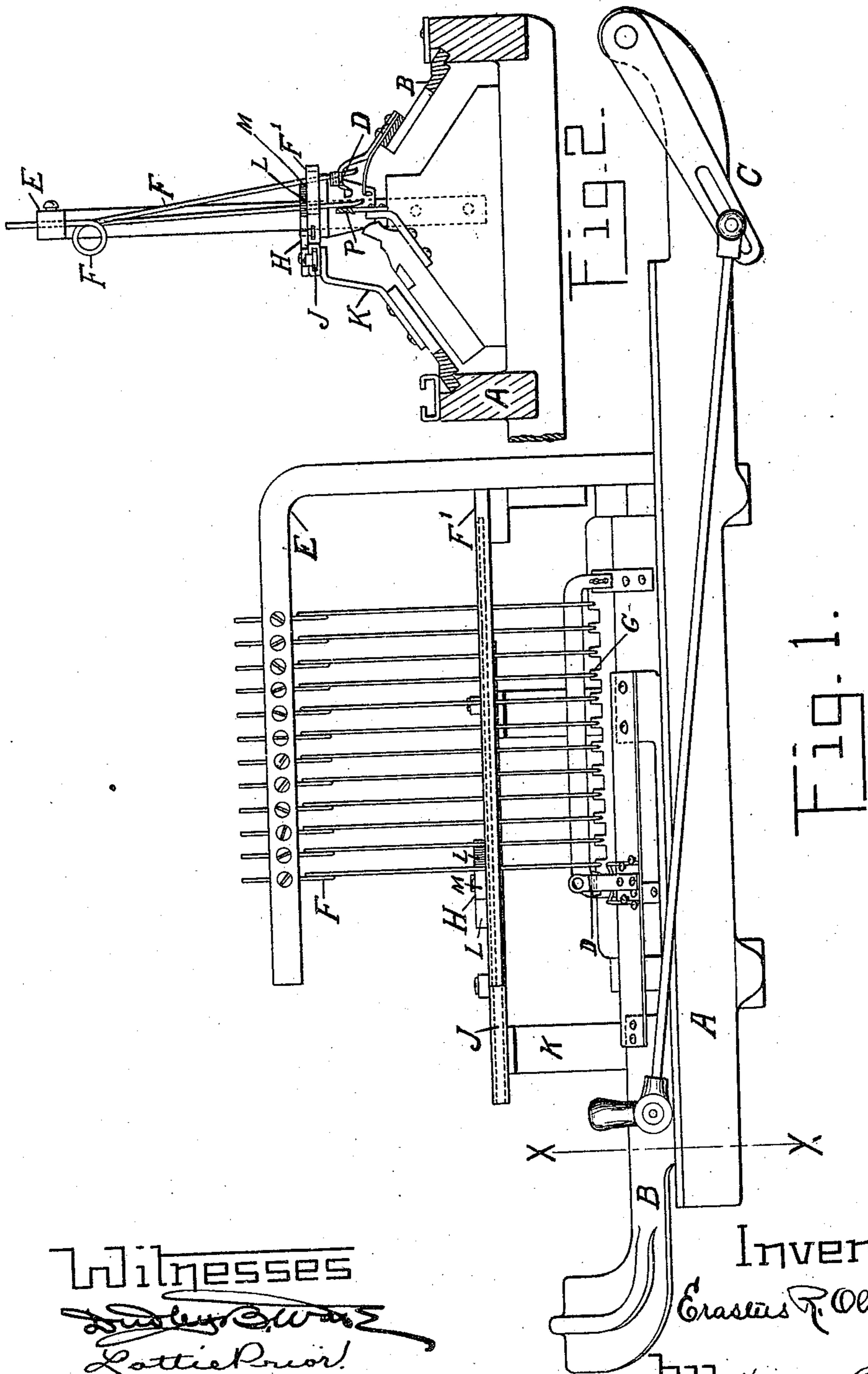


E. R. OLMSTED.
 LOOPING DEVICE FOR KNITTING MACHINES.
 APPLICATION FILED JUNE 25, 1906.

Patented Feb. 7, 1911.

4 SHEETS—SHEET 1.

983,757.



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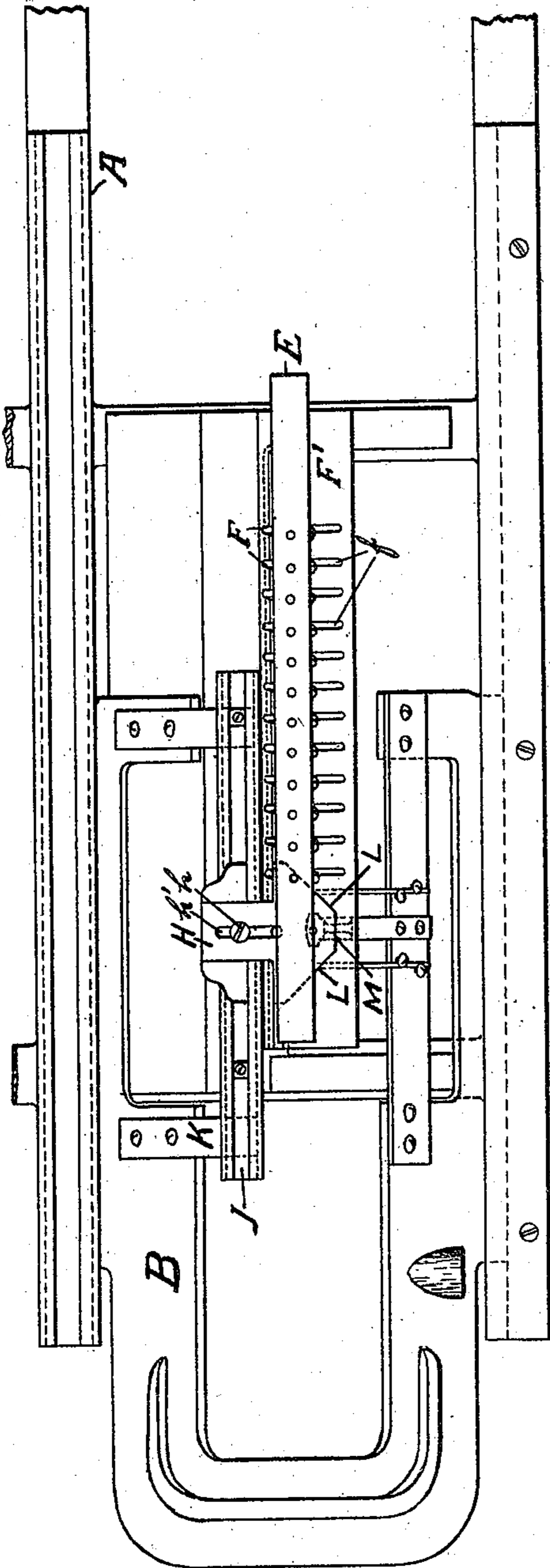


Fig. 4-

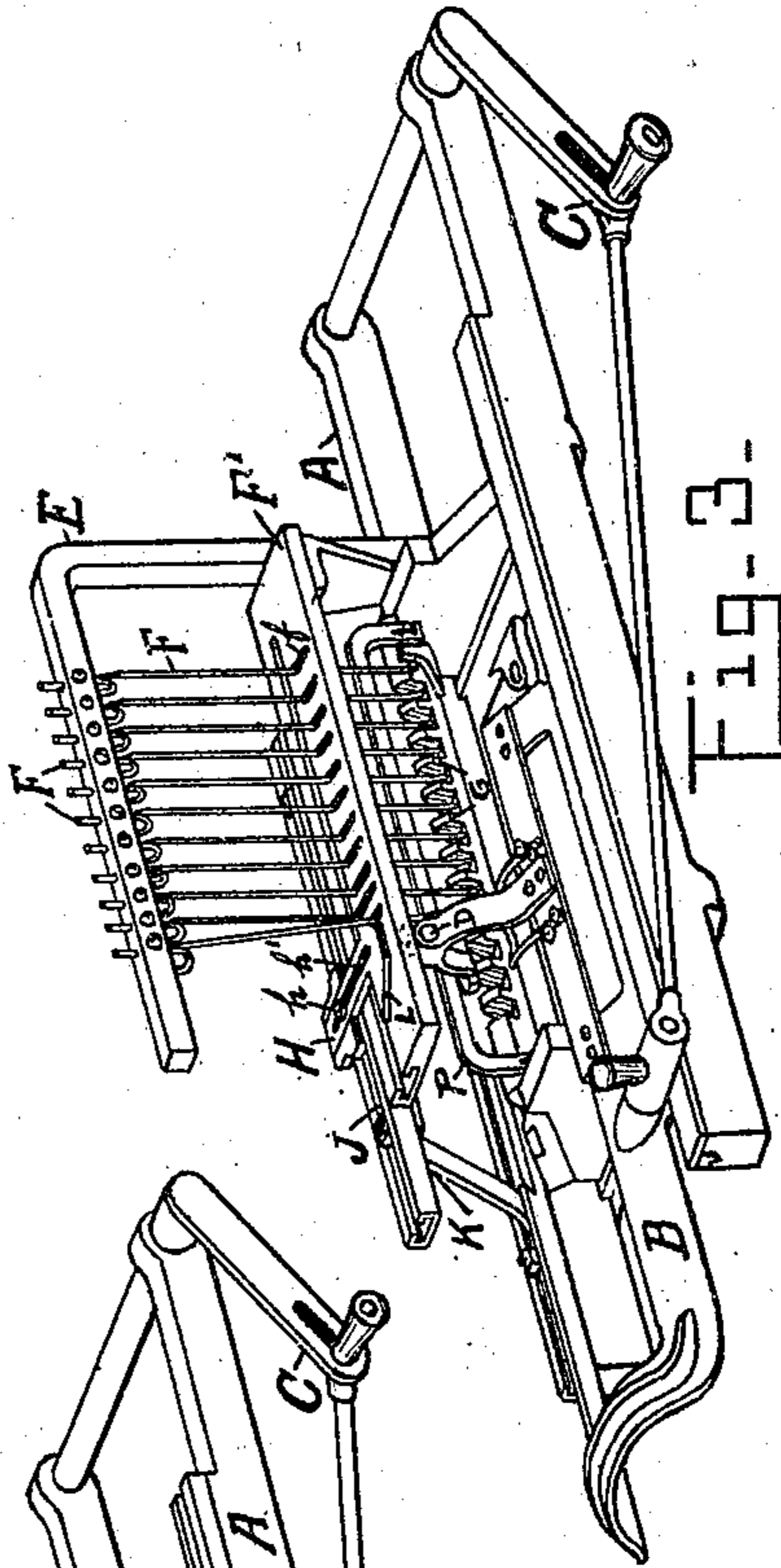


Fig. 3-

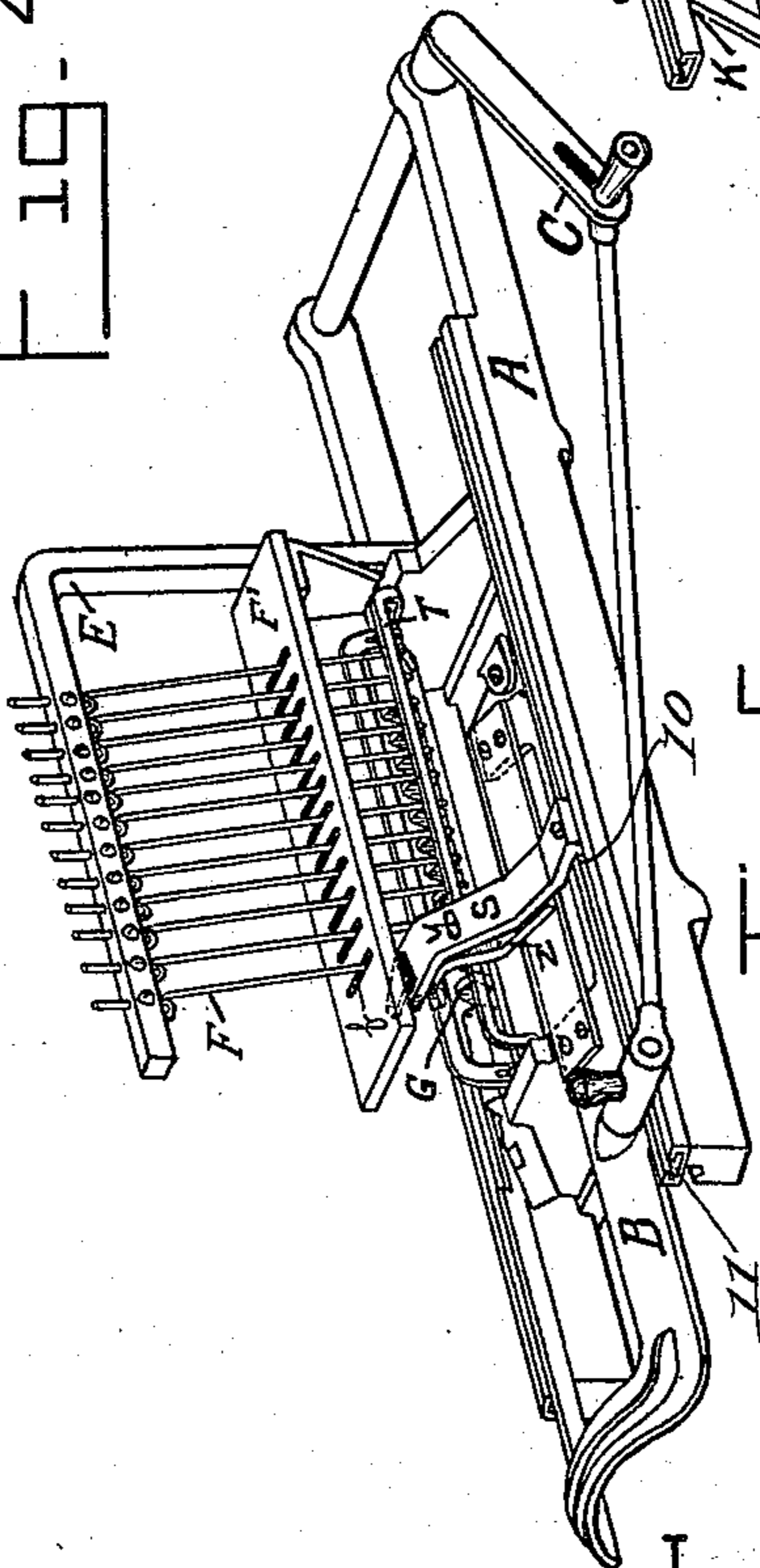


Fig. 5-

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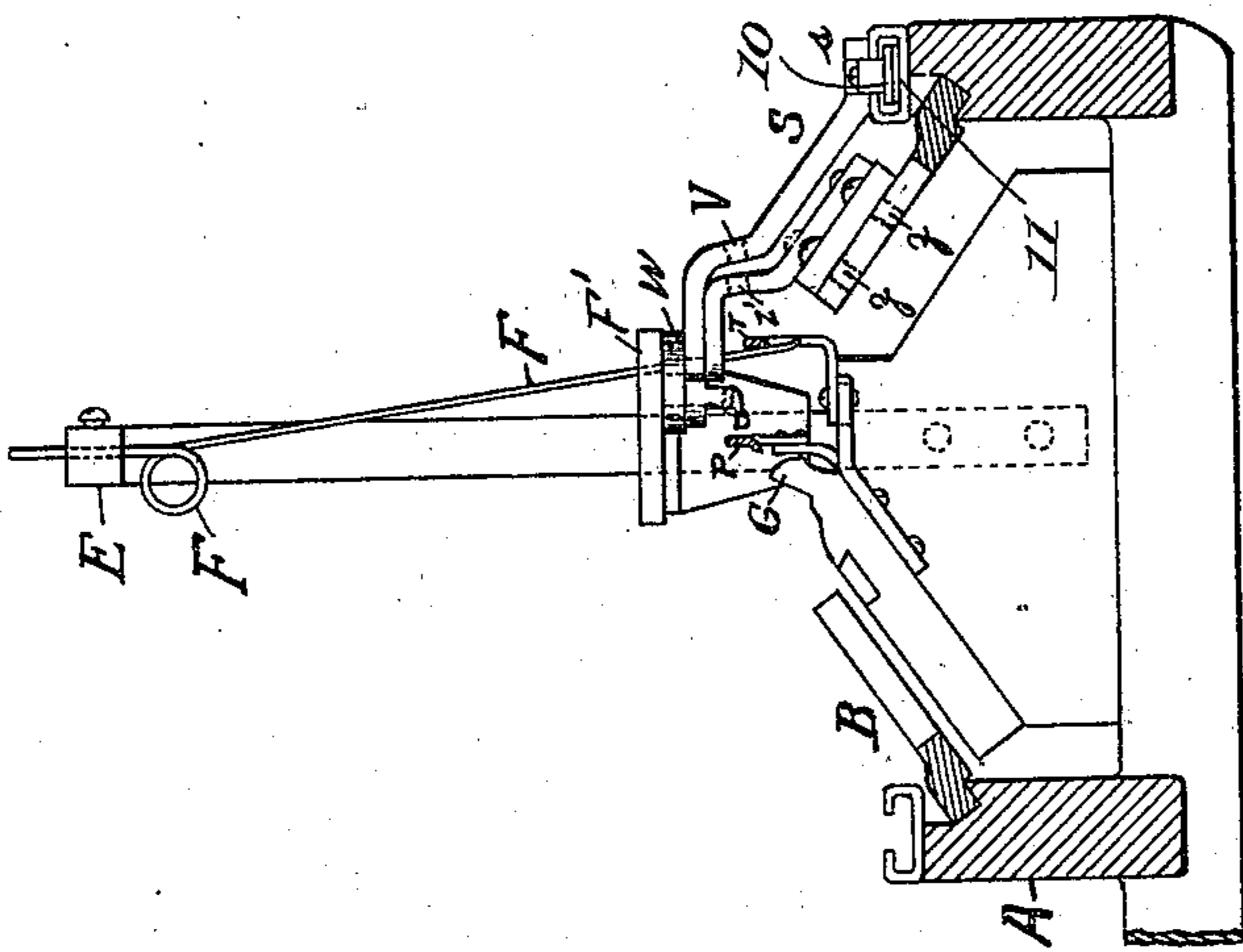


Fig. 7-

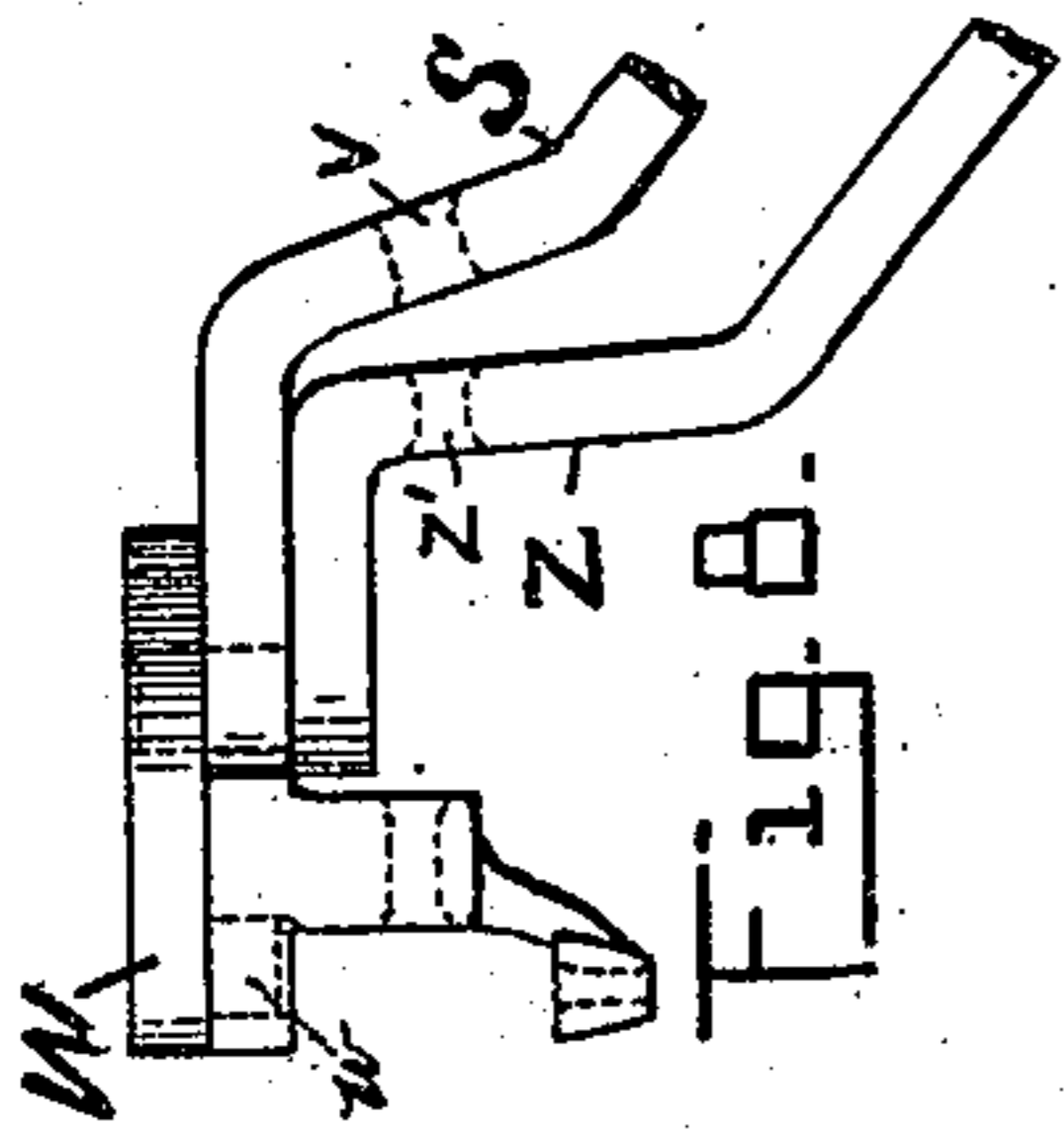


Fig. 8-

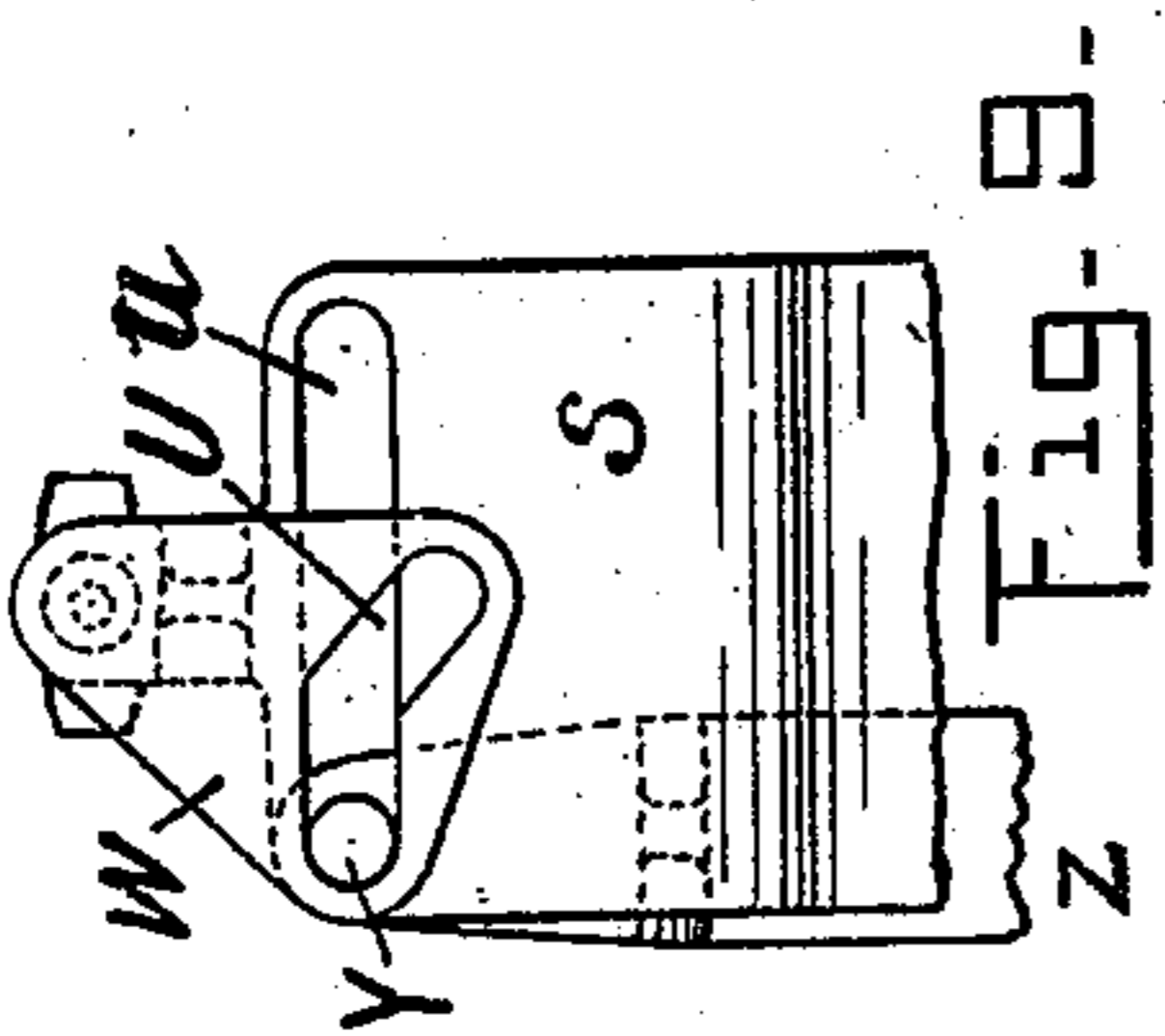


Fig. 9-

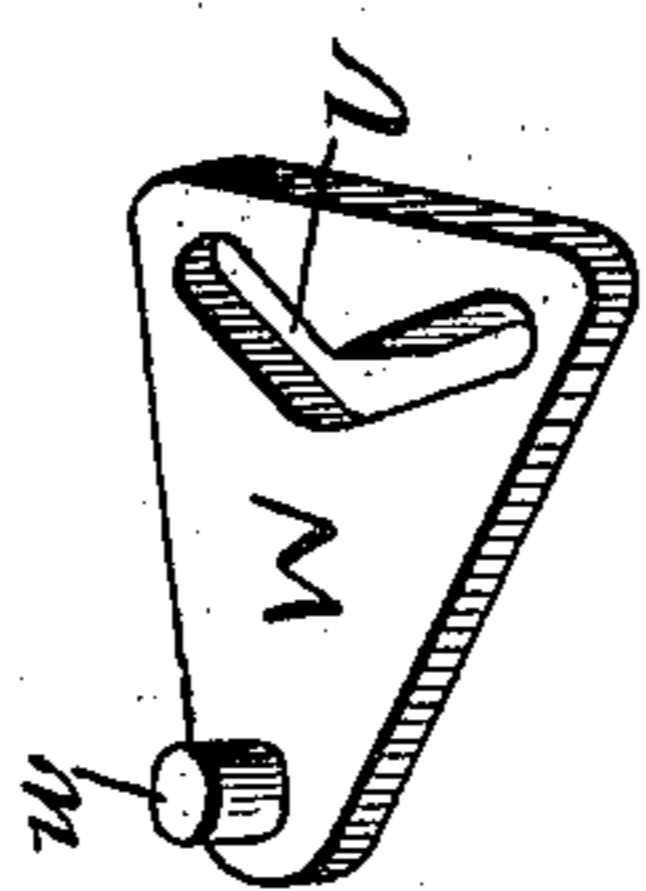


Fig. 10-

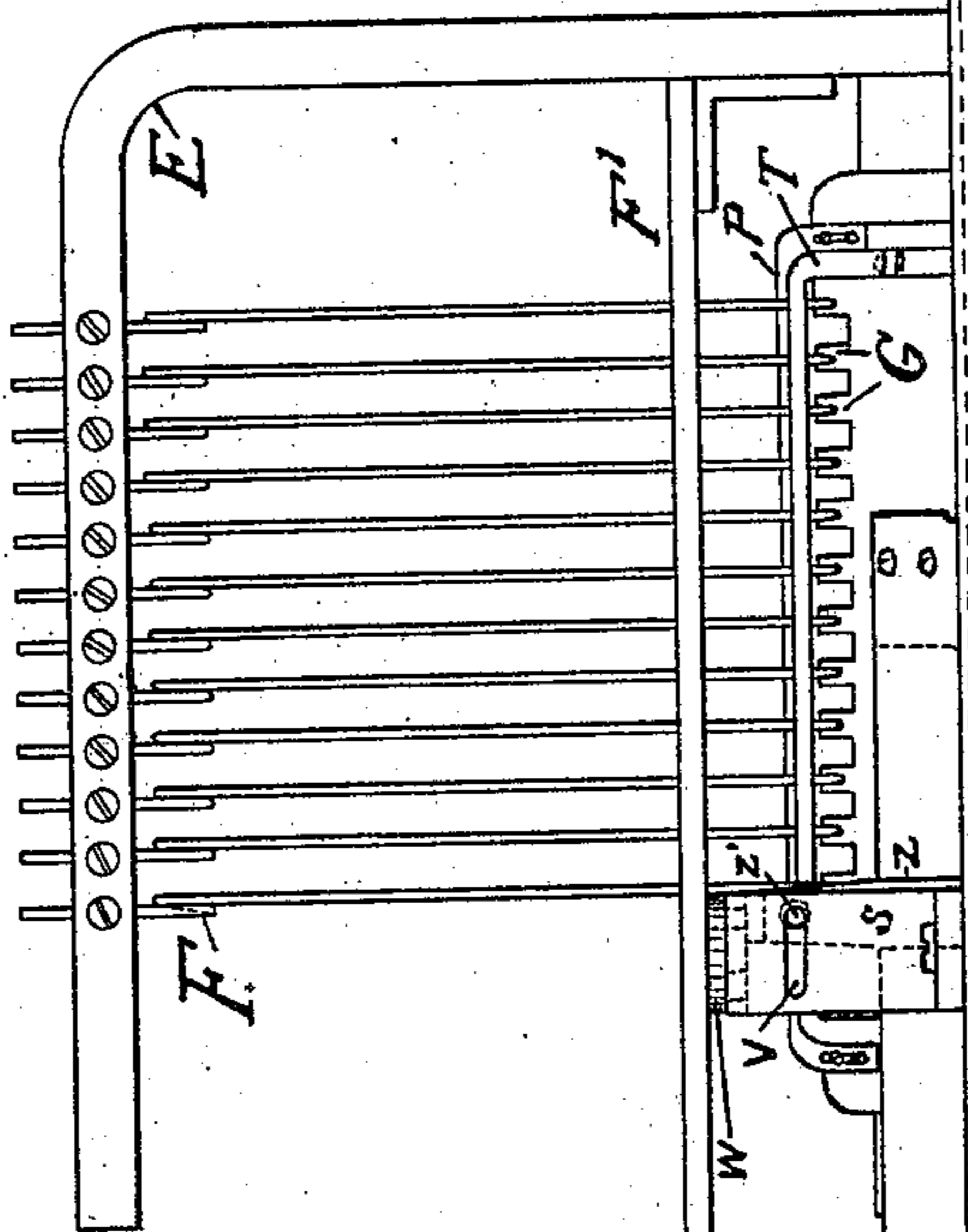
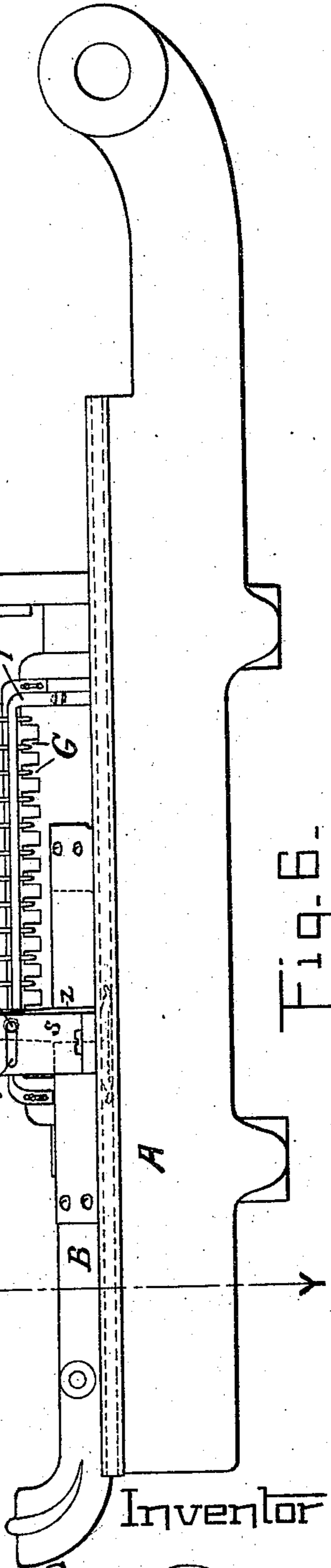


Fig. 6-



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4 SHEETS—SHEET 4.



Atty's

UNITED STATES PATENT OFFICE.

ERASTUS R. OLMSTED, OF SARATOGA SPRINGS, NEW YORK.

LOOPING DEVICE FOR KNITTING-MACHINES.

983,757.

Specification of Letters Patent.

Patented Feb. 7, 1911.

Application filed June 25, 1906. Serial No. 323,256.

To all whom it may concern:

Be it known that I, ERASTUS R. OLMSTED, a citizen of the United States, residing at Saratoga Springs, in the county of Saratoga and State of New York, have invented certain new and useful Improvements in Looping Devices for Knitting-Machines, of which the following is a specification.

My invention relates to improvements in knitting machines, and the object of my invention is to provide an attachment for automatically making a ruche stitch border simultaneously with the knitting of the body portion of the article constructed. I attain this object by means of the mechanism illustrated in the accompanying drawings, in which:

Figure 1 is a front elevation. Fig. 2 is a cross section along the lines X—X on Fig. 1. Fig. 3 is a perspective view. Fig. 4 is a plan. Fig. 5 is a perspective of a modified form. Fig. 6 is a front elevation of the modified form shown in perspective in Fig. 5. Fig. 7 is a cross section along the lines Y—Y on Fig. 6. Fig. 8 is a detail enlarged view of the cam, W, and the support, shown in the modified form in Figs. 5, 6 and 7. Fig. 9 is a plan, with parts broken away, of the cam, W, and its connections. Fig. 10 is an inverted perspective of the cam, W. Fig. 11 is a perspective of the cam support. Fig. 12 is a perspective of the cam operating arm. Fig. 13 is a perspective of the latch opener. Fig. 14 is a perspective view of the bar, T. Fig. 15 is an elevation of the needle and a detail sectional view of the latch opener. Fig. 16 is a view of the ruche stitch. Fig. 17 is an enlarged detail plan view, partly in section, showing the manner of feeding the yarns to the needles and the position of the fingers during the operation of making the ruche.

Similar letters refer to similar parts throughout the several views.

For the purpose of making a ruching for the border of a bed-room slipper, throw or other knitted article, I have invented and produced an attachment, whereby the needles in a knitting machine may be supplied with yarn and caused to unite the same with the body of the knitted article, and have arranged a means for pulling out or extending the loop of the stitch to form what I term a ruche along the border of the article.

I use, preferably, one side or bank of a

knitting machine, in which the needles are placed in grooves in the needle-bed, and sloped at an angle of about forty-five degrees, using a carriage, which is operated within the needle-bed, and by its operation, by suitable cam apparatus, sets in motion the needles to which yarn is fed, all in the usual manner.

I attach to the knitting machine a series of wire fingers, properly supported, which will project between the ends of the needles when they emerge from the work, and operate said wires or fingers in such a manner that they will draw out the yarn fed to them, making a series of loops, to a certain predetermined degree, and thus produce the ruche border to the article.

Within the frame, A, a carriage, B, is operated by power, as desired.

The carriage contains means, not shown, for operating the needles up and down in the grooves, and also contains the yarn guide, 2, for delivering the backing yarn 3 to the needles, Q, see Fig. 17. As the carriage is reciprocated in the needle-bed the needles are operated, supplied with yarn and drawn back in the usual manner common to knitting machines of the type shown in the drawings.

Secured to the frame A in any suitable manner I place a right-angled upright, E, the horizontal portion of said right-angled support extending over the carriage, and, preferably, arranged in the same vertical plane as the ends of the needles. Depending from the said horizontal portion of the support, E, I arrange a series of preferably wire fingers, F, the tips of which register between the needles, and substantially in connection with the projections, G, which form the partitions between adjacent needles. The fingers, F, project through elongated openings, f, in the block, F', supported to the frame at one end, as shown in Fig. 3, and upon which block cam-plate, H, preferably engages. I preferably loop the fingers, F, in order to give them a spring, and in the arrangement shown in Figs. 1 to 4 cause the fingers to normally stand in contact with said projections between the needles, respectively. As thus arranged I feed the ruche yarn through the yarn guide, D to the needles Q after they have been projected forward of the fingers, F, and the loops will be made by fingers, F, drawing out

the ruche yarn from between the needles, as shown in Fig. 17, thereby forming the ruche.

I arrange to make the ruche by pressing the finger away from the needles, which puts the finger under tension by means of the spring loop therein, as shown in Figs. 1 to 4 inclusive and Fig. 17, or I may arrange the fingers so that their spring will tend to force them away from the needles, and use a mechanical means for pushing them in toward the needles after the loop has been extended to the extent desired. This latter arrangement is shown in Figs. 8 to 12 inclusive and also in Fig. 5.

In Fig. 3 is clearly seen in perspective the cam-plate, H, arranged to be set at the desired position, by means of a set-screw, h, and slot, h', the plate being adjusted within the groove, J, in the support, K, attached to the carriage, B. The end of the cam-plate, H, is cam shaped, preferably, provided with two surfaces, L, L, flaring outwardly to a surface, M, which is substantially parallel with the axis of the carriage.

As thus arranged as the carriage reciprocates in the frame one after another of the fingers, F, will engage the flaring sides of the cam-plate, H, which will force the finger outward until it reaches the surface, M, after passing along which it will move down the side opposite to which it engaged first, and will resume its position in contact with the partition between two adjacent needles.

In Fig. 17 the location of the yarns, needles and fingers during the operation of forming the ruche is shown in detail. The carriage is moving from left to right, in the direction shown by arrow in said figure. One of the fingers, F, is at the position denominated in Fig. 17 as 24, having been forced out by the inclined surface, L, of the cam, H, (not shown in said Fig. 17.) Two of the fingers, F, F, are at the positions 23 and 22, respectively, in contact with the surface, M, of the cam plate H. As the finger, F, which was at the position 24, moves forward along the cam surface, L, it pulls the ruching yarn, O, through the needle Q⁴⁴, and yarn guide D, until it has reached the forward limit. The finger, F, at position 25 is in position to be engaged by the cam face L starting out when 24 reaches the limit, which is about the same time that the needle Q⁴⁵ is drawn back carrying the ruching yarn and back yarn through the stitch already on the needle Q⁴⁵ and as it moves back the stitch already on closes the latch, p, of the needle and then slips off the end thereof, forming the tie, 4, of the stitch shown in Fig. 16.

It is understood that the backing yarn, 3, is fed to the needles through the yarn guide, 2, in the usual manner. The two yarns are

separated at the time of their engagement with the needles by the fingers F, the backing yarn being fed on one side of the fingers, F, and the ruching yarn on the other side thereof, as shown in Fig. 17, the ruching yarn being an additional yarn inserted into the backing yarn forming the fabric, and which is drawn out into long loose loops by means of the fingers F.

I show the latch opener, P, Fig. 13 and in Figs. 15 and 17 illustrate the manner of opening the latch. The latch, p, of the needle, Q, is opened by coming in contact with the knife edge p'.

As above stated, I can make the ruche by causing the fingers, F, to normally engage the bar, T, opposite the projections, G, between the needles, respectively. As shown in Fig. 5 in order to cause the fingers to come between the needles before the yarn is drawn into the fabric, I preferably arrange a cam, W, shown in inverted perspective in Fig. 10, and which cam is of triangular configuration and provided near its apex with a pin, w, adapted to engage an opening, w', in the cam support S, see Fig. 11. The cam, W, also has an irregularly formed slotted opening, U, near its base. The cam support, S, is secured to the sliding block, 10, which block reciprocates in groove, 11, in the frame, as shown in Figs. 5 and 7, and is provided with an opening, V, through which the yarn passes, making a yarn guide, and is also provided with a slotted opening, u, through which a pin, Y, on the end of the cam-operating arm, Z, passes and engages the irregular-shaped opening, U in the cam, W, the cam-operating arm, Z, being attached to the carriage by means of screws, z, z, as shown in Fig. 7, or in any suitable manner. I also provide in the cam-operating arm, Z, an opening, Z', through which the yarn passes after passing through the opening, V in the cam support, S. The object of providing for the reciprocation of the foot of the support, S, is to permit the cam, W, to be moved by means of the cam operating arm, Z, when the carriage reaches the extent of its movement in either direction, and begins to move in the opposite direction, the friction between the block and the groove causing a slight movement of the block in the groove upon a reversal of the direction of the movement of the carriage. As thus arranged as the carriage moves the fingers, F, one by one engage the cam, W, which causes the finger to move gradually toward the needles and after the finger has passed the apex of the cam will spring or snap out away from the needles to the extent of its throw. The finger moving gradually toward the apex of the cam generates little friction, and when it passes the apex of the cam it springs out quickly and does away with that binding and pulling on the other fingers and the

needles, which takes place in a greater or less degree in the operation of the device shown in Fig. 3. However, each of the means illustrated and described herein for causing the fingers to move to and from the needles, perform the result of elongating the loop, and making the ruche.

It is understood that the yarn used for making the ruching is a separate yarn from that used for making the body of the goods or back thread.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a looping device for knitting machines; a finger supporting arm attached to the frame of the knitting machine; a series of fingers depending from said arm, registering between the projecting needles of the knitting machine; a means for feeding an independent ruche yarn to the needles; with a means for causing said fingers successively to move away from the needles, thereby drawing out into the form of a loop the ruche yarn, substantially as described.

2. In a looping device for knitting machines, the combination of a knitting machine provided with a carriage; a needle bed; a series of needles; a means for moving said carriage; a support attached to the frame of the machine extending above and over the machine; a series of fingers depending from said support; the tips of said fingers extending between said needles when projected; a cam plate supported by said carriage and adapted to engage said fingers,

respectively, simultaneously with the movement of the carriage; a means for feeding a ruche yarn, substantially as described.

3. In a looping device for knitting machines; the combination of a knitting machine, consisting of a carriage; a series of needles; a needle bed; a means for moving said carriage; a finger support secured to the frame of said machine; a series of fingers depending from said support; a means for moving said fingers alternately, automatically and simultaneously with the movement of said carriage; a means for feeding an independent ruche yarn to said needles when projecting with the tips of the fingers between them, substantially as described.

4. In a looping device for knitting machines; a finger support secured to the frame of the machine; a series of fingers depending therefrom; a cam of triangular configuration; a pin connected therewith near its apex, provided with an irregularly formed slot near its base; a cam support; a sliding block attached to the foot of said cam support; said block reciprocating in a groove in the frame; a means for feeding an independent ruche yarn to the needles; a cam operating arm attached to the carriage.

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

ERASTUS R. OLMSTED.

Witnesses:

FREDERICK W. CAMERON,
JOHN N. HUYCK.