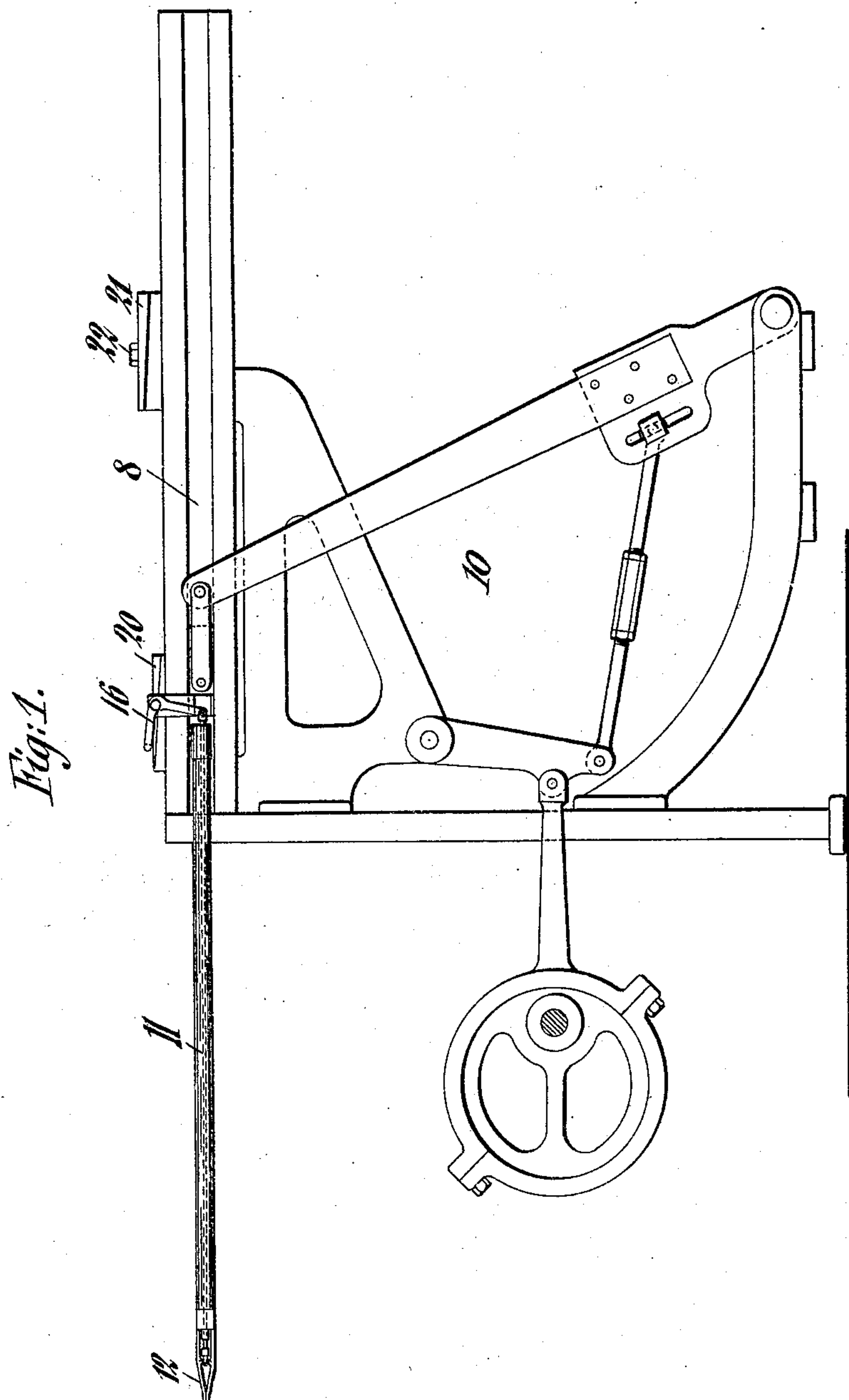


929,346.

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APPLICATION FILED FEB. 23, 1909.

Patented July 27, 1909.  
3 SHEETS—SHEET 1.



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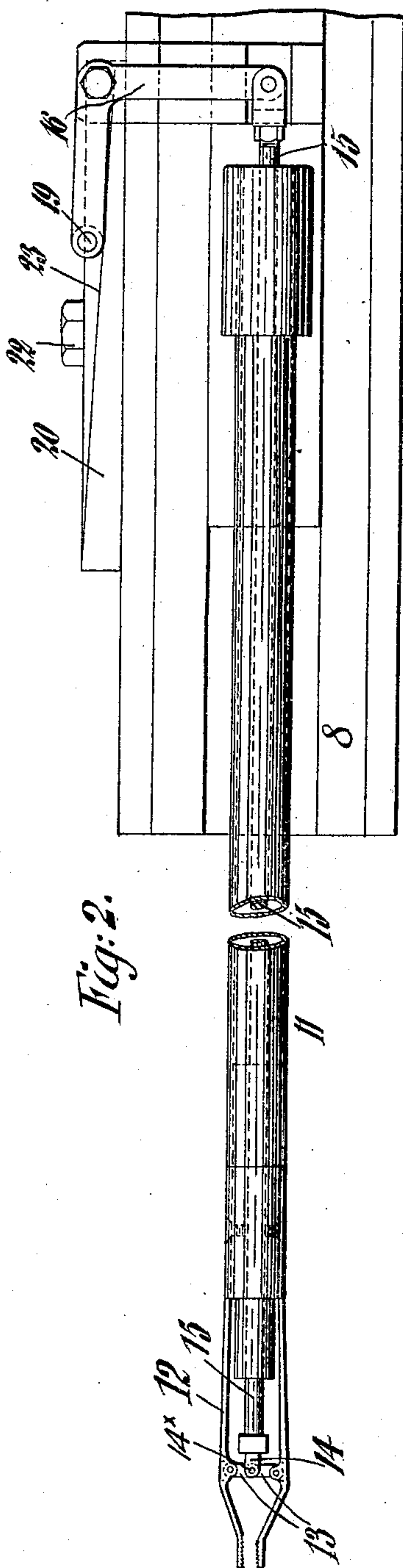


Fig. 2.

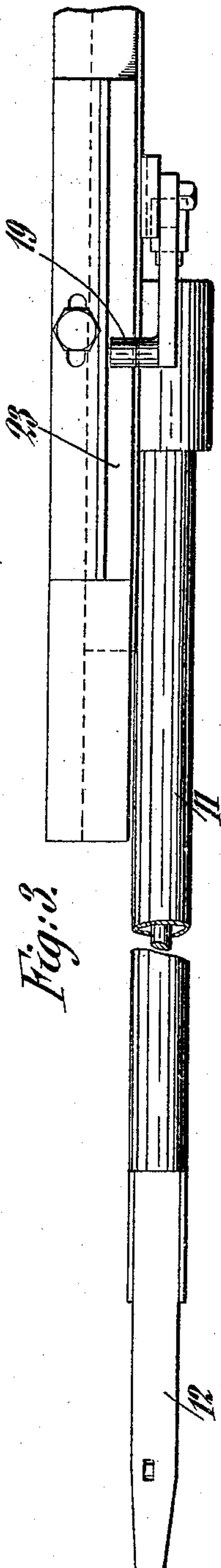


Fig. 3.

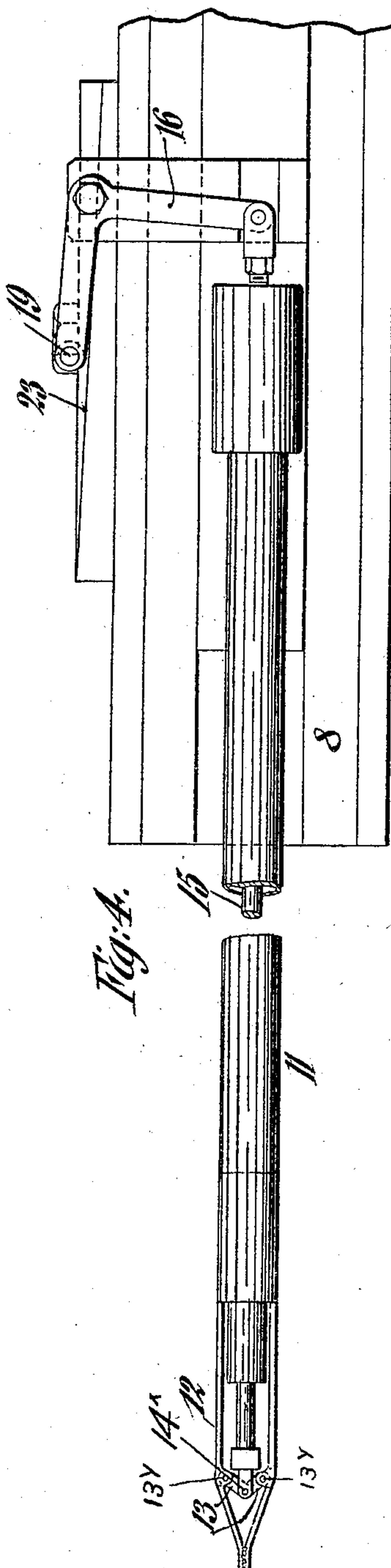


Fig. 4.

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Fig. 6.

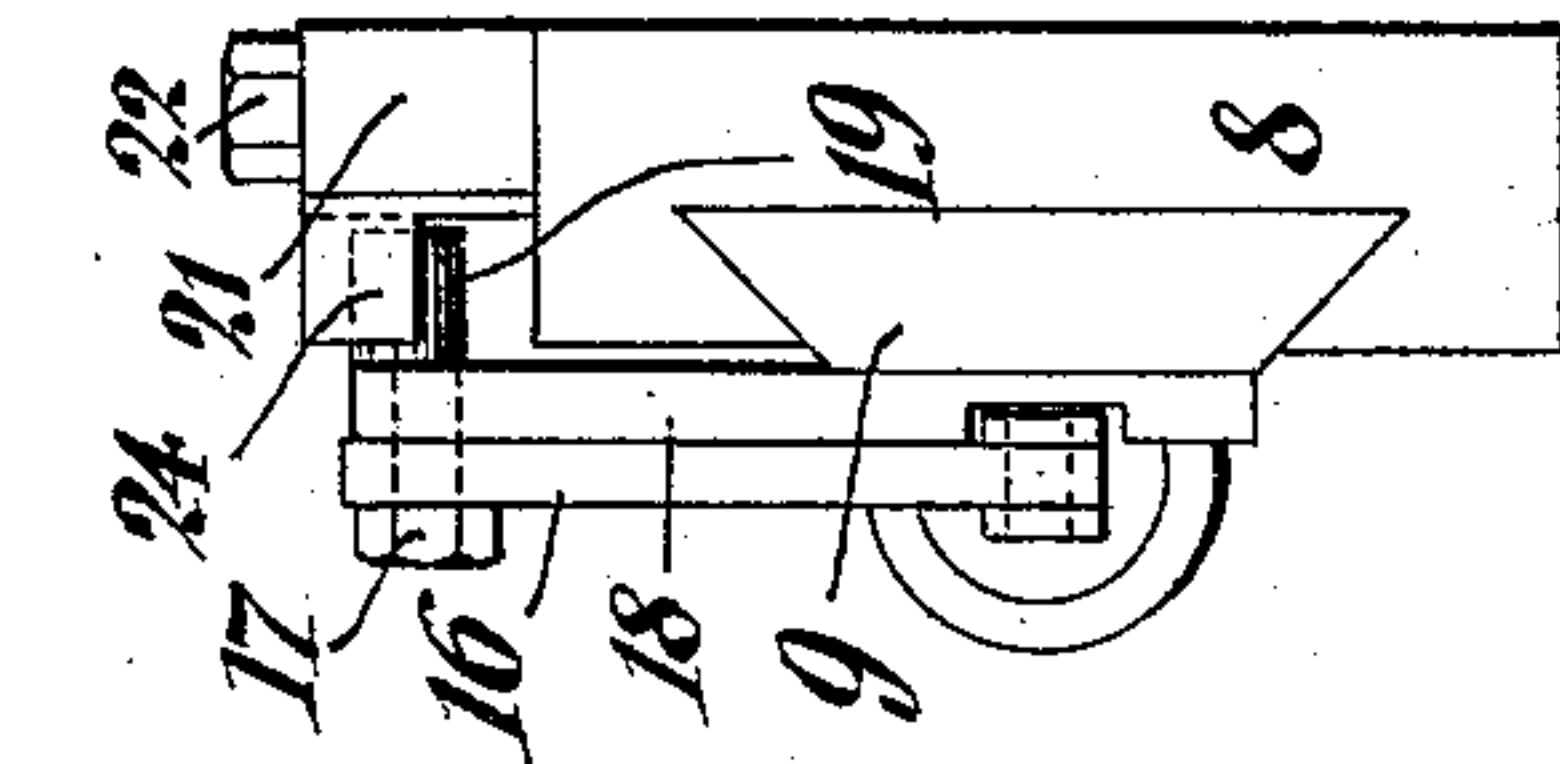


Fig. 5.

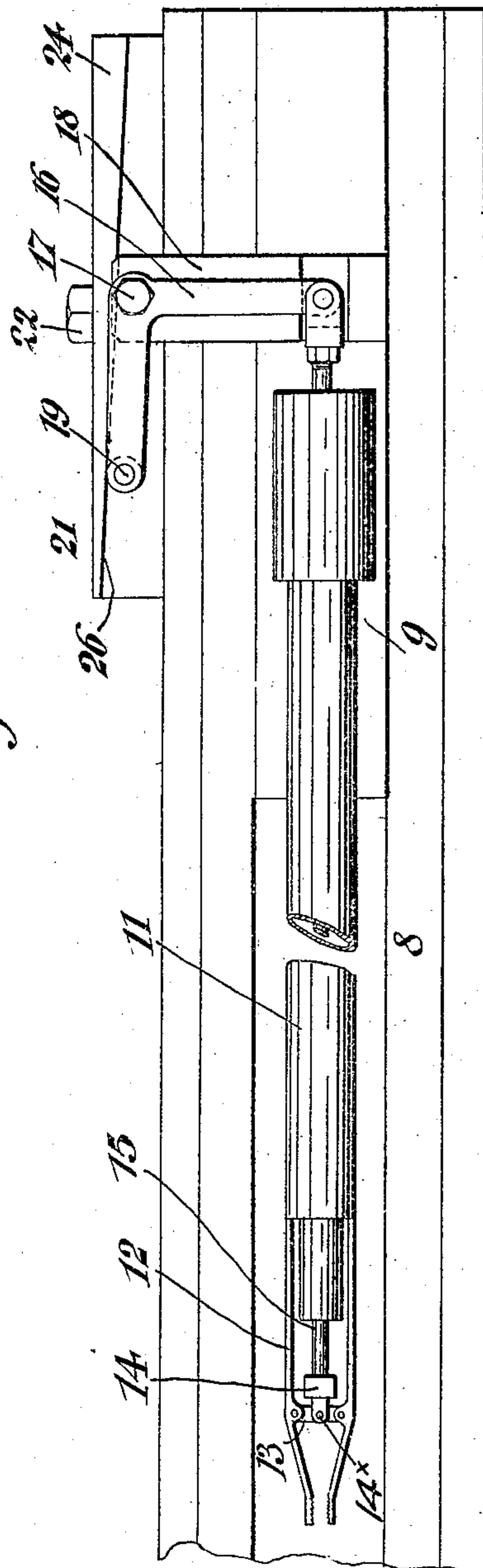
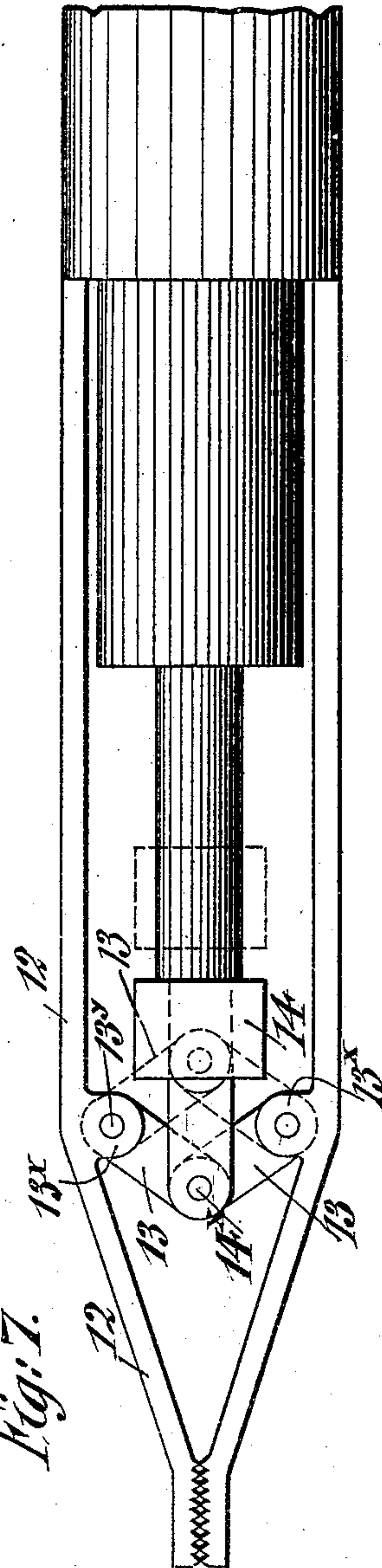


Fig. 7.



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# UNITED STATES PATENT OFFICE.

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## NEEDLE MECHANISM FOR CANE-LOOMS.

No. 929,346.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed February 23, 1909. Serial No. 479,624.

*To all whom it may concern:*

Be it known that I, JOSEPH TILP, a citizen of the Empire of Austria-Hungary, residing in Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Needle Mechanism for Cane-Looms, of which the following is a specification.

This invention relates to needle mechanism for cane-loom and to the general type of needle mechanism described in Letters Patent No. 865,283 granted to William Wattie on September 3, 1907. In needle mechanism of this kind, which is employed in cane-loom, there is provided an elongated laterally-reciprocating needle which traverses the shed to grasp and lay in the weft-strands, the needle being provided with gripping mechanism whereby it is closed on and released from the strand at the proper time.

In the Wattie patent mentioned, and in other patents, the gripping of the needle on the strand and its release from the latter are shown as being caused by the action of a reciprocating wedge entering between the normally closed spring-jaws of the needle at its gripping end, this wedge being actuated by means of a longitudinal rod extending through the needle proper and actuated by means of cam-surfaces on the guideway for the needle to open and close the needle-jaws by the action of said wedge. This mechanism, however, has the drawback that the wedge is not securely positioned with respect to the gripping jaws and that the elbow-lever for reciprocating the wedge-carrying rod has to ride for a comparatively great distance in frictional contact with the cam-surfaces; moreover, after riding over the surfaces the elbow-lever has to drop off from the same before the wedge will be properly actuated, and it often happens that the elbow-lever catches and fails to drop off from the cam-surfaces, so that the needle fails to grip the strand.

The present invention has for its object to overcome the above-mentioned difficulties and to provide an opening and closing device for the needle-jaws which is securely positioned with respect to these jaws, and which need move only through a very small space to move the jaws from open to closed position, and vice versa. The invention does away with the riding of the actuating elbow-lever for any considerable distance

over its guide-surfaces and causes said lever, after momentarily contacting with the guide-surfaces to open or close the jaws, as the case may be, to jump away from said surfaces, so that there will be no further friction.

With these ends in view the invention consists in a needle mechanism in which a needle of the usual type is employed and between the spring-jaws of which needle is arranged a small toggle mechanism actuated by the usual operating rod and elbow-lever to open and close the jaws, as will be hereinafter explained. The elbow-lever, instead of riding at its free end over two cam-surfaces, rides over one of these surfaces and under the other and contacts with them only momentarily, as will also be described hereinafter.

In the accompanying drawing, Figure 1 is a front-elevation of a needle mechanism for cane-loom constructed in accordance with the invention, Fig. 2 is an enlarged view of a portion of Fig. 1, showing the gripping jaws open, Fig. 3 is a top-view of the needle and its adjunctive parts, Fig. 4 is a view similar to Fig. 2, but showing the gripping jaws in closed position, Fig. 5 shows the needle in its retracted position, that is to say, when it is in the position farthest to the right with reference to Fig. 1, Fig. 6 is an end-view of Fig. 5, and Fig. 7 is an enlarged detail view of the gripping end of the needle, showing the toggle-operated opening and closing mechanism.

Similar characters of reference indicate corresponding parts throughout the different figures of the drawing.

As has been heretofore indicated, the needle is of the usual type except for the specific opening and closing mechanism for its spring-jaws, and the needle can be reciprocated in its guideway in any suitable manner. In the drawing, 8 indicates the usual guideway; 9, the sliding block guided therein; 10, the mechanism for reciprocating said block, which mechanism may, as stated, be of any character whatsoever; and 11, the reciprocating needle mounted on the guide-block.

The spring-jaws 12 of the needle are normally closed and in contact with each other, due to the spring action of the metal. According to this invention, these jaws are opened and closed at the proper time by



means of a toggle mechanism, shown in detail in Fig. 7, and consisting of links 13 pivoted to the inner surfaces of the jaws immediately of the length of the latter, and both connected at their inner ends with the forward end 14 of a longitudinal actuating rod 15 extending through the hollow needle. The connection between the links and the jaws is preferably made by means of eyes 13<sup>x</sup> on the jaws and pivot-pins 13<sup>y</sup>, the ends of the links being pivoted to each other and to the rod 15 by means of a pivot-pin 14<sup>x</sup>, as shown in Fig. 7. The butt-end of the actuating rod 15 is connected to an elbow-lever 16 fulcrumed at 17 to an upright 18 on the guide-block 9, and having at its free end a cylindrical projection 19 extending laterally over the top of the guideway 8, as shown in Fig. 6.

Secured to the upper edge of the guideway are cams or guide-blocks 20, 21, of which the block 20 is located at the left of the guideway with reference to Fig. 1 and intended to actuate the elbow-lever 16 in such a manner as to close the jaws on the strand to be pulled through the warp; while the other guide-block 21 is located at the right of the guideway with reference to Fig. 1 and designed to open the needle-jaws to release the weft-strand when it reaches its proper position with regard to the warp. Both the guide-blocks 20 and 21 are adjustable longitudinally of the guideway by means of bolts 22, which, however, is in itself well known.

The guide-block 20, which causes the closing of the needle-jaws, is formed with an upper inclined surface 23, as shown in Figs. 2, 3 and 4, which the laterally-extending pin 19 of the elbow-lever overlies. The guide-block 21 is formed in a somewhat different manner, as shown in Fig. 5, it being provided with an upper overhanging portion 24, which is inclined at its under-portion to form a sloping surface 26 under which the pin 19 enters and with which it rides in contact through a short distance. The inclined surfaces 23 and 26 are substantially parallel with each other, as shown in Fig. 1, so that the free end of the elbow-lever is guided in a straight line from which it deviates only to a slight extent.

The open position of the needle-jaws 12 is shown in Fig. 2. In this position the links 13 are alined with each other and the pivot-pin 14<sup>x</sup> is in line with the pivot-pins 13<sup>y</sup>, so that the jaws are spread apart to a distance corresponding to the combined lengths of said links. It is obvious that when the links are in this position the spring action of the jaws, which tend to close, is sufficient to move said links, unless they are exactly on a dead-center, which is rarely, if ever, the case, to one side or the other of their pivots 13<sup>y</sup>, and in either of these positions the jaws will be closed. Therefore it is evident that

in order to spread the jaws, it is simply necessary to pull the rod 15 from the position shown in Fig. 4 to that shown in Fig. 2, whereupon the links will be straightened out, as shown in the latter figure, to spread the jaws. This actuation of the rod 15, in order to produce both the opening and the closing of the jaws, is effected by the elbow-lever and the two guide-blocks with which it coacts. Let us suppose that the needle is in the position shown in Fig. 1 and that the jaws, during the backward movement of the needle to pull the strand into the warp, are closed on the strand. In this position of the jaws the link 13 will be in the position shown in Fig. 4, and the pin 19 will be out of contact with the inclined surface 23 of the guide-block 20 at the left. When the elbow-lever reaches the guide-block 21 it passes under the inclined overhanging part 24, as shown in Fig. 5, and then at a certain point abuts momentarily, by means of its pin 19, against said inclined part, so that the elbow-lever is swung on its pivot and the links 13 pulled from the position shown in Fig. 4 through the position shown in Fig. 5 into a position in which their connecting pivot-pin 14<sup>x</sup> is at the right-hand side, with reference to Fig. 5, of a line connecting the pivots 13<sup>y</sup>. This movement of the links causes the jaws to be opened momentarily, when the links assume the position shown in Fig. 5, and the strand is therefore released in its proper position with respect to the warp-strands. On the movement of the needle in the opposite direction, namely, its forward movement, the links will remain in the position into which they have been moved, until the pin 19, in riding over the inclined surface 23 of the block 20, contacts with said surface and by swinging the lever 16 moves the links over to the other side of a plane passing through their fixed ends, whereby the jaws are opened momentarily, as before, and then closed on the next strand to be grasped and carried into the warp.

The links 13 snap with great rapidity from a position at one side of the plane connecting their fixed ends to a position at the other side, and as soon as this has been effected the pin 19 jumps away from the corresponding guide-surface, so that there is no further friction. The center pivot-pin 14<sup>x</sup> has only a very short distance to travel between its two extreme positions, and the throwing of the links from one side of their normal center-plane to the other can be effected with a minimum amount of work and friction. By adjusting the guide-blocks 20, 21 longitudinally of the guideway by means of their bolts 22 the actuation of the links can be made to take place at exactly the proper point. Further, the fact that the pin 19 of the elbow-lever only contacts momentarily with the guide-surfaces and does



not have to drop off the same is a very important feature as it produces a very reliable operation of the device, regardless of the speed.

5 Although the improved mechanism is described as being used in connection with cane-loom, it may be used successfully in the weaving of numerous other fabrics; and the mechanism may, of course, be changed  
10 as to its detailed construction without departing from the invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

15 1. In needle mechanism for cane-loom, a needle having spring-jaws, and automatically-operated toggle mechanism located between the jaws to spread the same.

20 2. In needle mechanism for cane-loom, a needle having normally closed spring-jaws, a toggle interposed between the jaws to spread and open the same, and an automatically-actuated operating rod for the toggle extending longitudinally through the needle.

25 3. In needle mechanism for cane-loom, a needle having normally closed spring-jaws, links connected with the inner faces of said jaws intermediately of the length of the latter and connected with each other, and means  
30 to move the connection between the links from one side to the other of the normal plane of the links.

35 4. In needle mechanism for cane-loom, the combination of a laterally-reciprocating needle, spring-jaws carried thereby, toggle-links connecting the jaws, a rod extending through the needle and connected with the links, and means to actuate the rod at different points in the travel of the needle.

5. In needle mechanism for cane-loom, 40 the combination of a reciprocating needle having normally closed spring-jaws, toggle mechanism to spread said jaws embodying an actuating rod, a guide-block, and an  
45 elbow-lever connected with the actuating rod and movable at its free end in contact with the guide-block to operate the toggle, said free end after such actuation immediately jumping away from its guide-surface.

6. In needle mechanism for cane-loom, 50 the combination of a reciprocating needle having gripping jaws, toggle mechanism to spread said jaws, operating mechanism for the toggle embodying an elbow-lever which moves with the needle, and guide-blocks with  
55 which one end of the elbow-lever coacts at opposite ends of the travel of the needle, one of said guide-blocks having a guide-surface which the end of said lever overlies, and the other having a guide-surface overhanging  
60 said lever-end.

7. In needle mechanism for cane-loom, the combination of a reciprocating needle having normally closed spring-jaws, toggle-links connecting said jaws and which spread  
65 the same when said links are alined with each other, and means acting at each end of the reciprocatory movement of the needle to move the connection between said links from one side of the plane in which their jaw-  
70 ends are located to the other.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

JOSEPH TILP.

Witnesses:

HENRY J. SUHRBIER,  
FANNIE FISK.