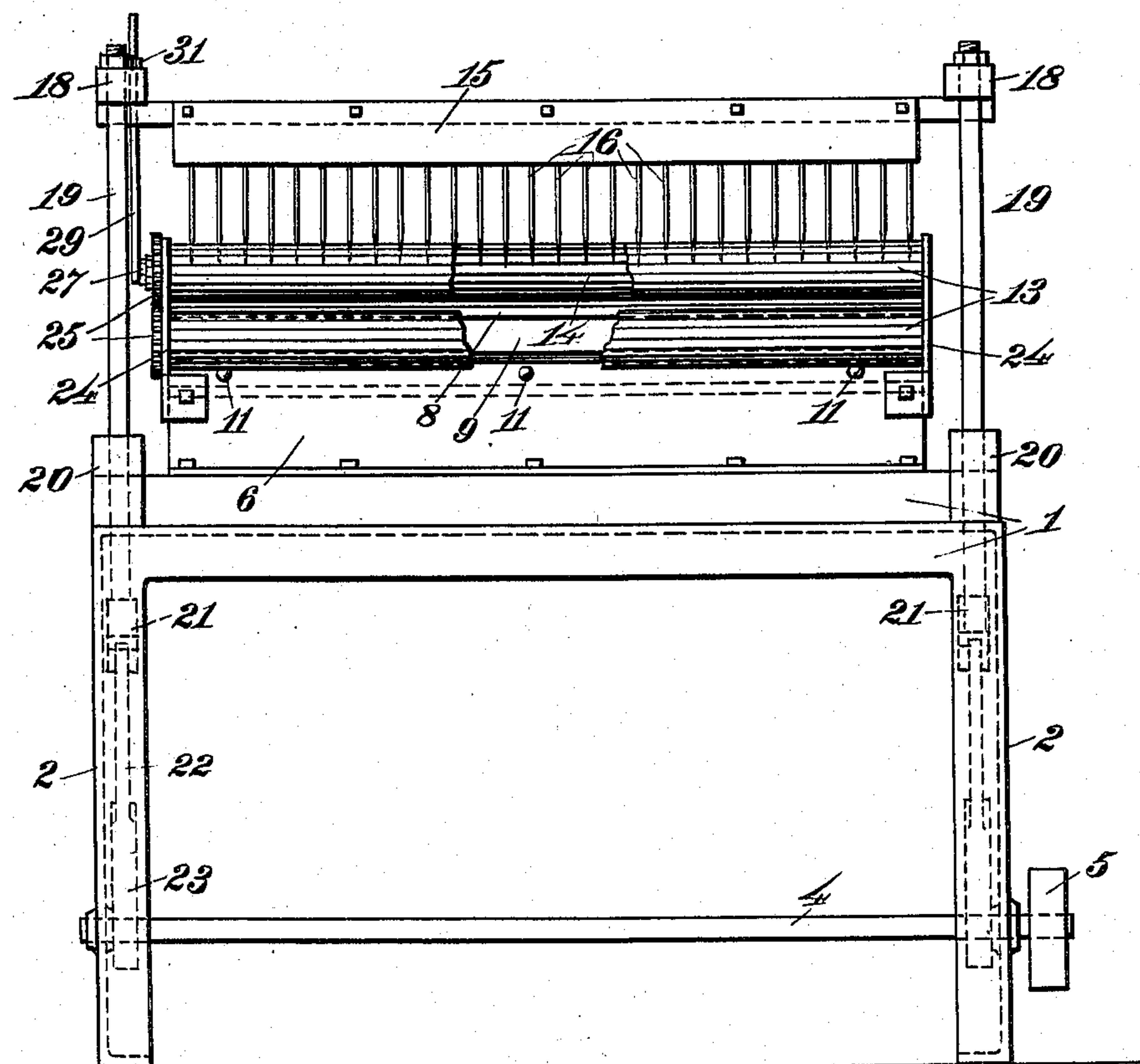


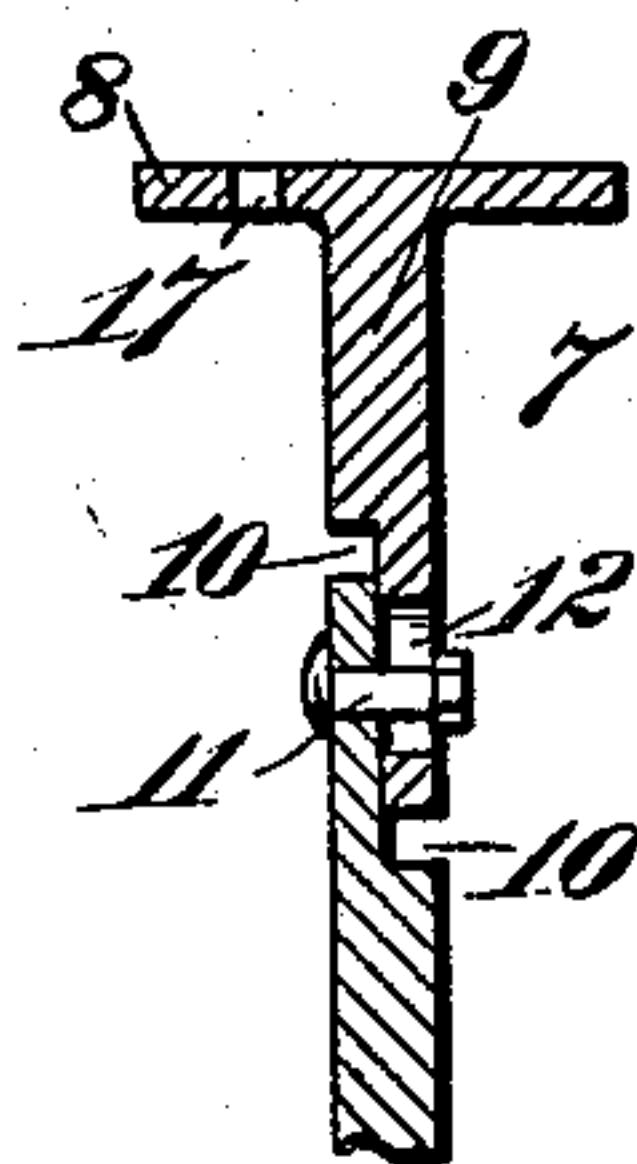
**916,096.**

Patented Mar. 23, 1909.

2 SHEETS—SHEET 1.



*Fig. 1.*



*Fig. 6.*

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Witnesses

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MACHINE FOR INTERWEAVING CURLED HORSEHAIR FABRIC.  
APPLICATION FILED MAR 13, 1908.

916,096.

Patented Mar. 23, 1909.

2 SHEETS—SHEET 2.

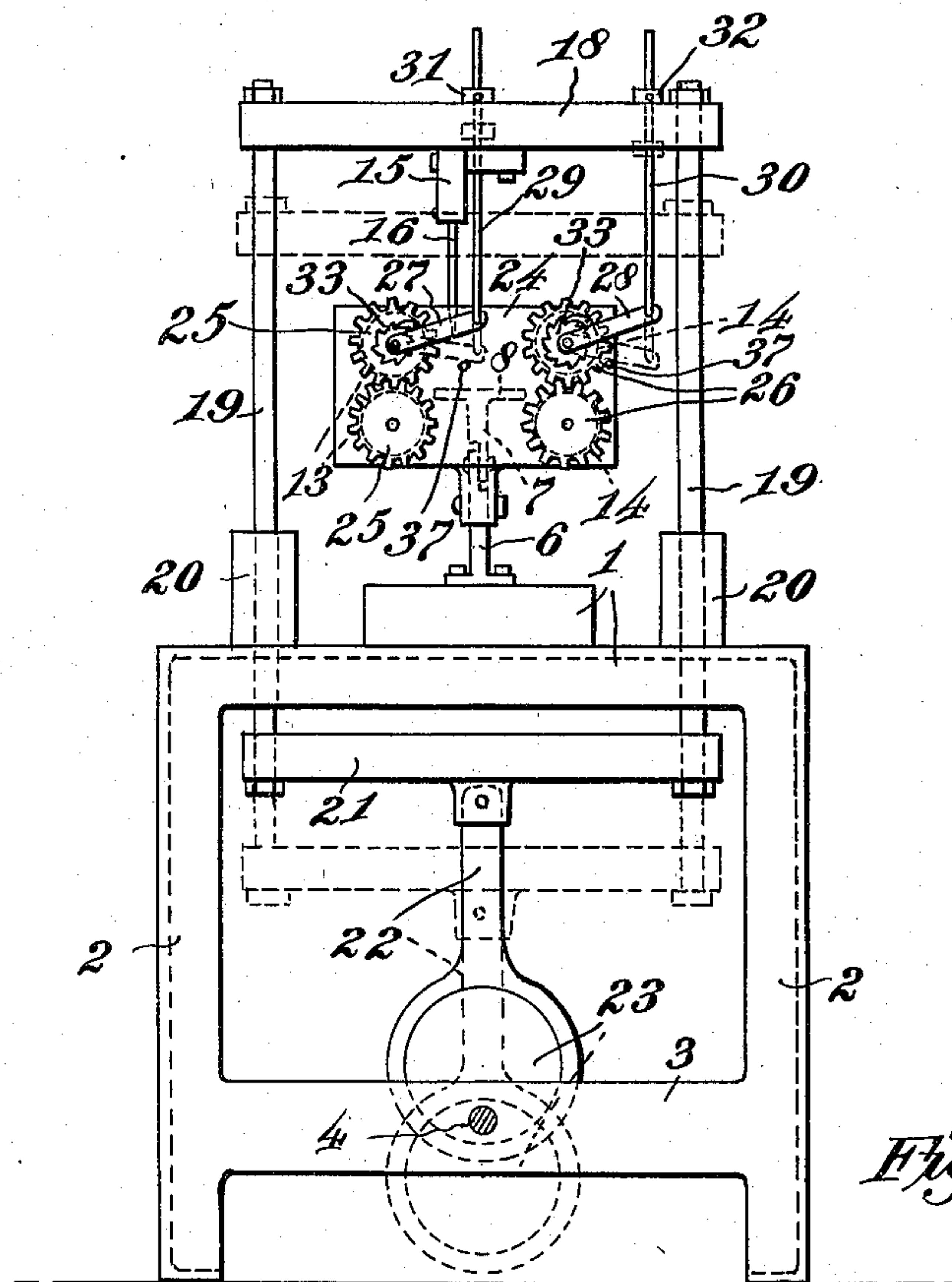


Fig. 2.

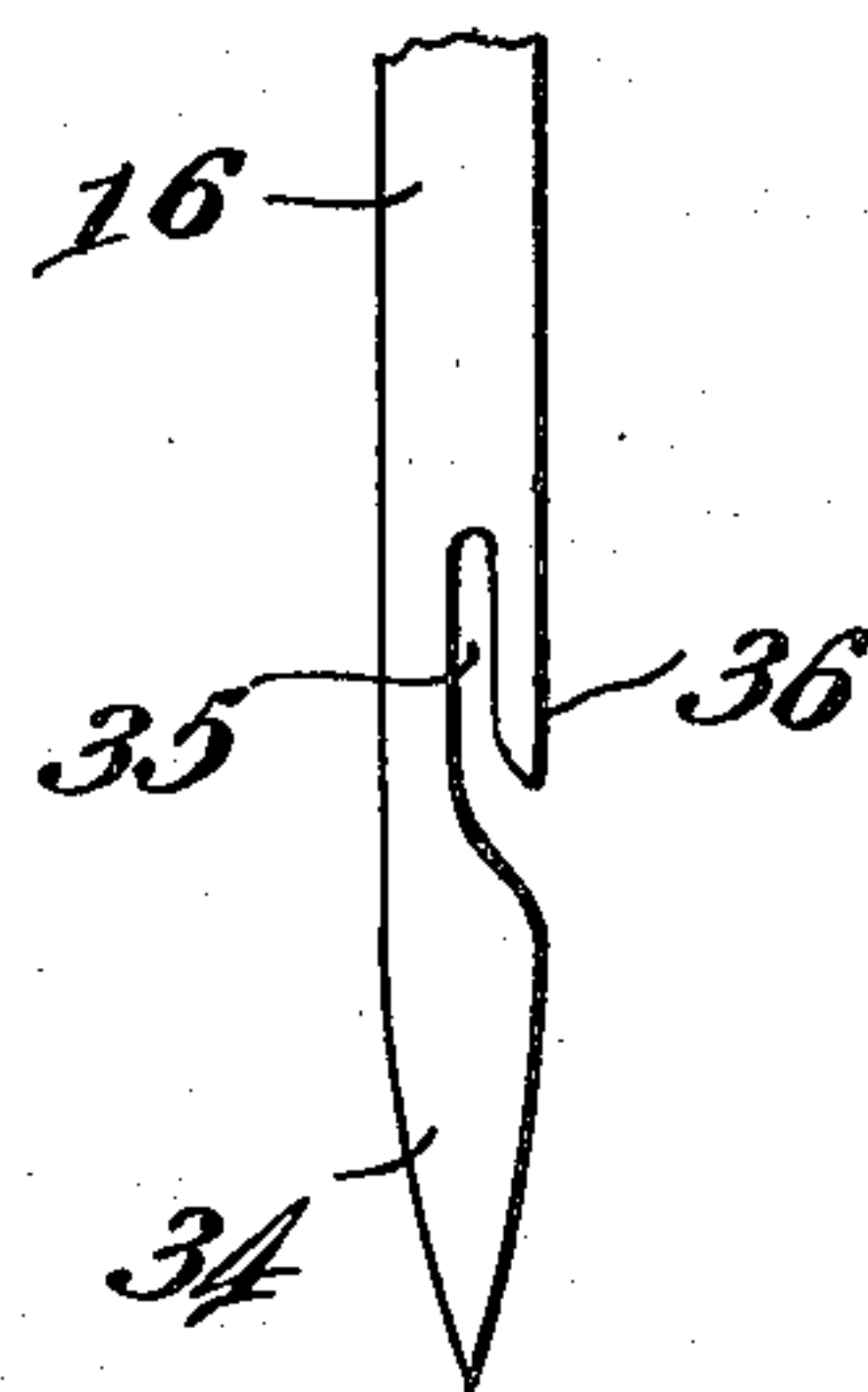


Fig. 7.

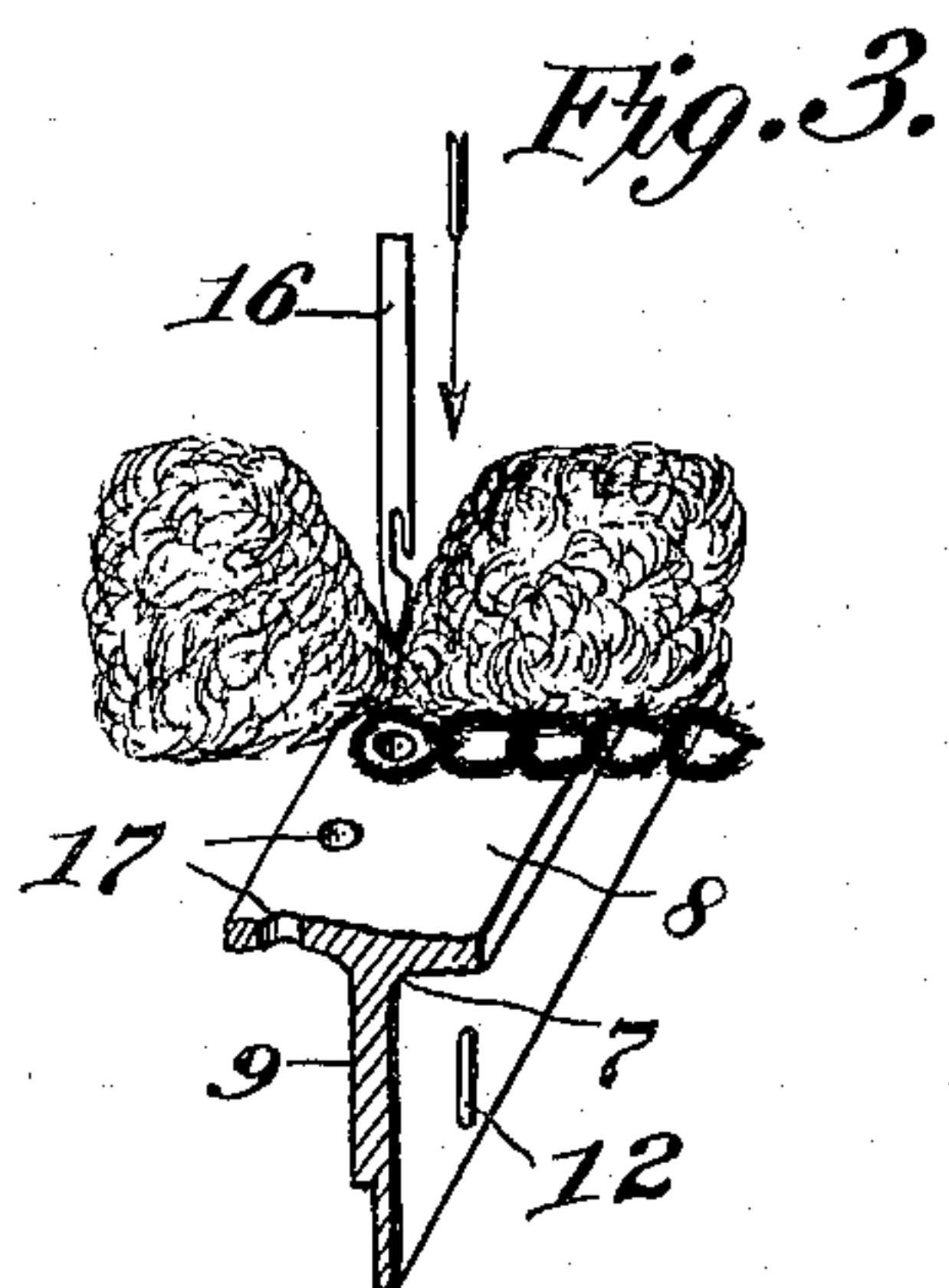


Fig. 3.

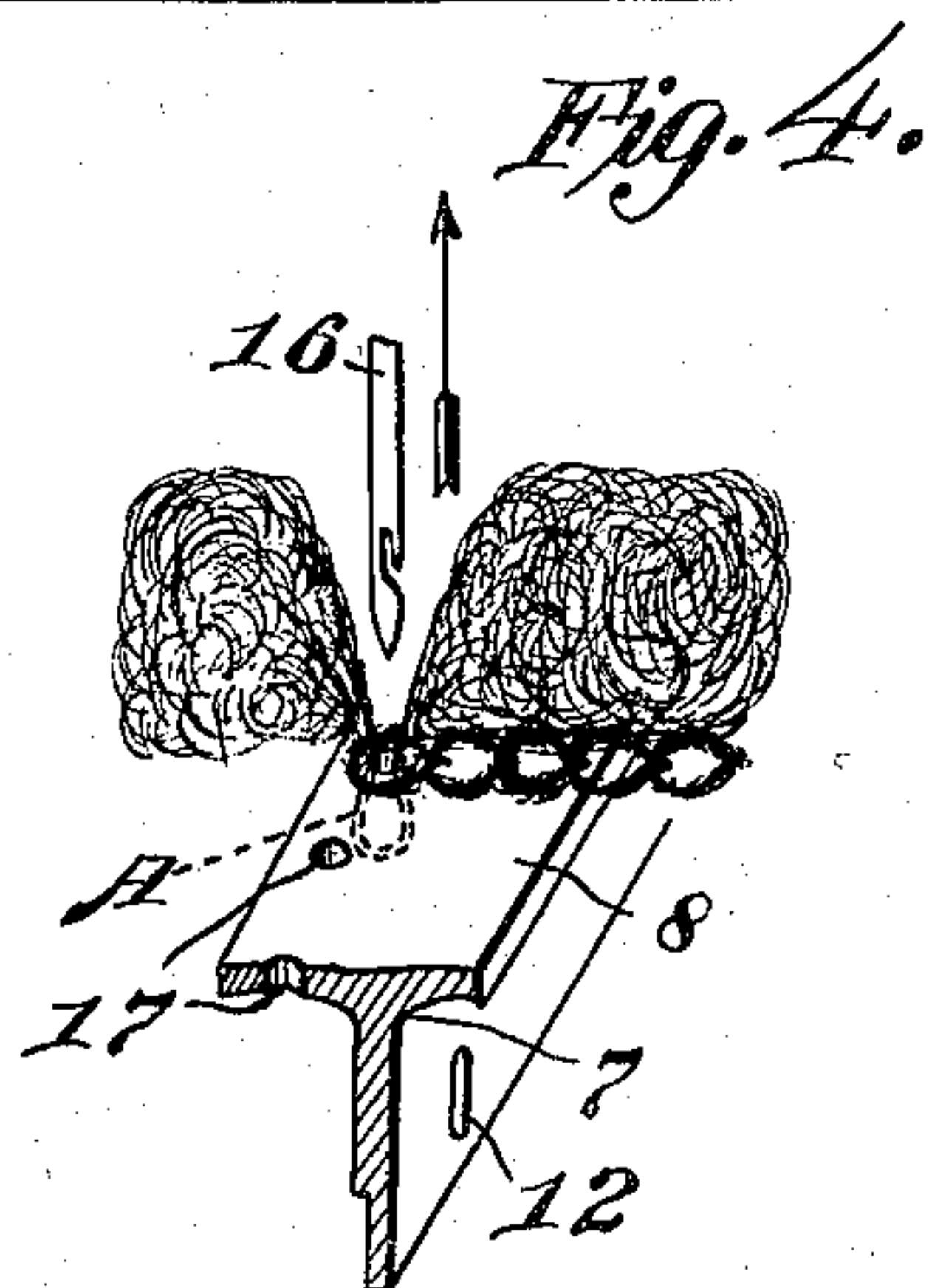


Fig. 4.

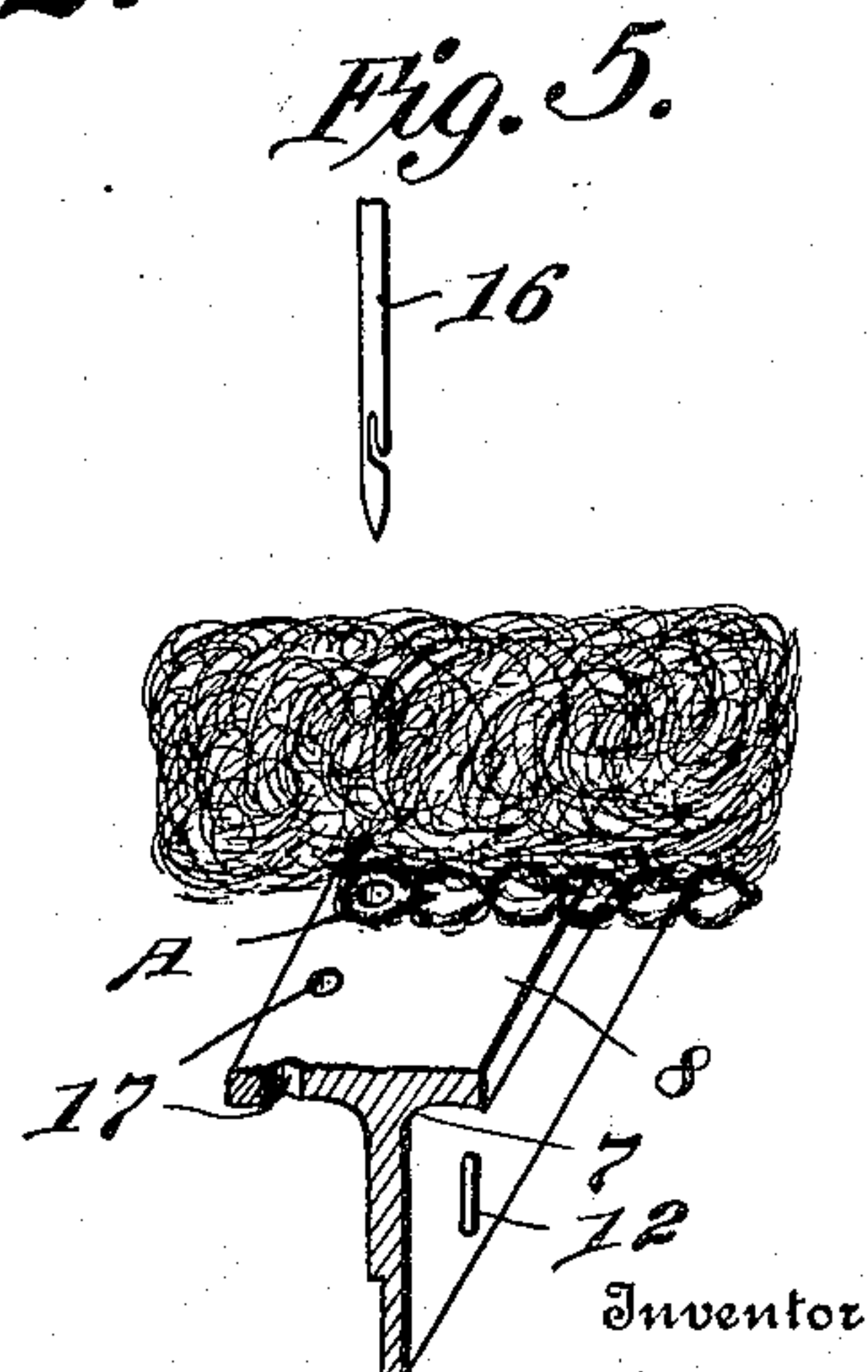


Fig. 5.

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# UNITED STATES PATENT OFFICE.

ARTHUR R. BILLINGTON, OF CHICAGO, ILLINOIS.

## MACHINE FOR INTERWEAVING CURLED HORSEHAIR FABRIC.

No. 916,096.

Specification of Letters Patent.

Patented March 23, 1909.

Application filed March 13, 1908. Serial No. 420,945.

*To all whom it may concern:*

Be it known that I, ARTHUR R. BILLINGTON, a citizen of the United States, residing at 2120 South Fortieth avenue, Chicago, in the county of Cook and the State of Illinois, have invented a new and useful Machine for Interweaving Curled Horsehair Fabric of Any Desired Length, Thickness, or Firmness, of which the following is a specification.

My invention relates to improvements in machines for weaving curled hair and the object of my invention is to provide a machine of the class mentioned whereby continuous sheets of fabric may be rapidly and quickly manufactured.

A further object of my invention is to provide a machine for weaving curled hair into fabric which may be adjusted to form fabric of the desired thickness.

A further object of my invention is to provide an improved needle for a machine of the character under consideration.

Other objects will appear hereinafter.

With these objects in view my invention consists generally in a weaving machine comprising two pair of feed rollers in combination with a throat plate arranged between the pairs of rollers, reciprocating needles arranged to cooperate with said throat plate, and suitable means for actuating said needles and the feed rollers.

My invention further consists in means for adjusting the throat plate to accommodate bats of different thicknesses and in means for adjusting the feed of each pair of rollers independently of each other in order to stretch or crowd the bat on the throat plate to vary the thickness and weight of the finished fabric.

My invention further consists in various details of construction and arrangements of parts all as will be fully described hereinafter and pointed out in the claims.

My invention will be more readily understood by reference to the accompanying drawing forming a part of this specification and in which—

Figure 1 is a front elevation of a weaving machine embodying my invention in its preferred form, Fig. 2 is an end elevation thereof, Fig. 3 is a detail perspective view illustrating the first step in the operation of the needle, Fig. 4 is a similar view illustrating the needle raising after having made a loop in the weave, Fig. 5 is a similar view illustrating the bat moved forward on the throat

plate and in position for the next downward stroke of the needle, Fig. 6 is a detail section illustrating the manner in which the throat plate is adjustably secured to the base, and Fig. 7 is a detail elevation of the end of the needle.

Referring to the drawings 1 indicates the bed frame of the machine supported upon the legs or members 2. The members 2 at each end of the machine are connected by transverse members 3 in which is mounted the main shaft 4 driven by a pulley 5 or other suitable drive mechanism.

Mounted on the bed 1 is a base 6 upon which the throat plate 7 is adjustably secured. The base 1 comprises a plate or bar extending longitudinally for a distance equal to or slightly greater than the width of the widest fabric to be manufactured thereon, that is it extends substantially the length of the machine. The throat plate is coextensive in length with the base 6 and comprises a horizontally disposed plate 8 and a depending flange or plate 9 which is preferably arranged midway of the width of the portion 8. The adjacent or overlapping edges of the plates 6 and 9 are rabbeted as at 10 and are connected by the bolts 11. The plate 9 is provided with vertical slots 12 to receive the bolts 11 and permit vertical adjustment of the throat plate.

Arranged in front of the throat plate is a pair of feed rollers 13 arranged one above the other and parallel with said plate. The horizontal portion 8 of the plate is arranged on a plane with the space between the rollers 13 so that the bat will be fed by the rollers onto said plate. Arranged behind said plate are a pair of similar rollers 14 which feed the completed fabric from the plate and hold the bat at the desired tension during the weaving operation.

Arranged above the plate 8 is a horizontal needle beam 15 in which are secured a plurality of parallel depending needles 16. Suitable means are provided for reciprocating the needle bar and needles vertically, and the plate 8 is provided with perforations or throats 17 corresponding in number and position to the needles to receive the same on the downward stroke. The needle beam 15 is fixed to cross-beams 18 which are secured to vertical reciprocatory rods 19 which are in turn slidably mounted in vertically disposed bearings 20 formed on the bed 1. The lower end of the rods 19 at each end of the machine



are connected by cross heads 21 which are connected by eccentric rods 22 to eccentrics 23 on the shaft 4.

The rollers 13 and 14 are mounted in bearings in brackets 24 secured to the frame of the machine. As shown in the drawings, the brackets are secured to the base 6 of the throat plate. The rollers 13 and 14 are corrugated and are provided with intermeshing gears 25 and 26 respectively, that is, the gears 25 on the rollers 13 intermesh and the gears 26 on the rollers 14 intermesh. Loosely mounted on the shafts of the upper rollers 13 and 14 are arms 27—28 to the outer ends of which are connected vertically disposed rods 29 and 30 which extend through the beams 18 and are provided at their upper ends with adjustable members 31 and 32. A ratchet connection 33 is provided between the arms 27 and 28 and their respective rollers or the gears thereon. As the beams rise they engage the stops 31 and 32 thereby rotating the rollers and as the members 31 and 32 are adjustable it is obvious that the feed of the rollers may be adjusted and that independently of each other.

Each needle is provided with a long, smooth point 34 above which it is notched as at 35 forming a point or hook 36 which engages the fabric and makes the loop as will be described hereinafter.

The operation of the device is as follows: As the shaft 4 rotates the needles are vertically reciprocated and the rollers are intermittently rotated to feed the bat across the throat plate. As the needles pass downwardly through the bat the hook 36 engages a number of the hairs in the bat and pushes them through the throat 17 forming a loop A. The needles are then retracted and as the beam engages the stop 32 the rolls 14 draw the bat forwardly a sufficient distance to withdraw the loop A from the throat leaving the same in the position shown in Fig. 5, wherein the loop surrounds the throat, the resiliency of the material holding the loop on proper position. Further upward movement of the beam 18 causes the same to engage the stop 31 and partially rotate the rollers 13. It is obvious that by adjusting the stops 31 and 32 on their respective rods the feed of the bat through the machine may be nicely regulated. As the needles again descend they engage other hairs in the bat and force another loop through the preceding loop lying on the throat plate and the throat as shown in Fig. 4 and the process is continued indefinitely. It should be noted that the point 34 of the needle enters the loop before the hook 36 and holds the preceding loop in position while the new loop

is being forced therethrough. It should be noted that the needle is entirely free from the bat when the latter is being fed through the machine which relieves the needles of all lateral strain. The arms 27 and 28, together with the rods and stops connected thereto are returned to normal position by gravity and their downward movement is limited by stops 37.

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

1. In a device of the class described, a plurality of parallel reciprocatory needles and a throat plate having corresponding perforations in alinement with said needles in combination with a pair of rollers for feeding a bat onto said plate and a similar pair of independently operated rolls for drawing the bat across the plate, substantially as described.

2. In a device of the class described, a plurality of parallel reciprocatory needles and a throat plate having a like number of perforations in alinement with said needles, in combination with a pair of rollers for feeding a bat onto said plate, a similar pair of rollers for drawing the bat across the plate and means operable by the reciprocation of said needles for actuating said pairs of rollers intermittently and independently of each other, substantially as described.

3. In a device of the class described, a plurality of parallel reciprocatory needles and a throat plate having a corresponding number of perforations in alinement with said needles, in combination with a pair of rollers for feeding a bat onto said plate, a similar pair of rollers for drawing the bat across the plate, means operable by the reciprocation of said needles for actuating said pairs of rollers, and adjustable means for timing the movement of said rollers and regulating the amount of movement thereof, substantially as described.

4. In a device of the class described, a plurality of parallel reciprocatory needles in combination with means for intermittently feeding a bat across the path of said needles, said needles being entirely removed from the bat during the movement of said bat, each of said needles being formed with an elongated point and a hook above said point to form a loop, and said point being adapted to engage the preceding loop prior to the insertion of the next loop, substantially as described.

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Witnesses:

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