

J. P. GAREY & J. S. LOWMAN.

YARN CLEANER.

APPLICATION FILED FEB. 19, 1910.

983,040.

Patented Jan. 31, 1911.

FIG. 1.

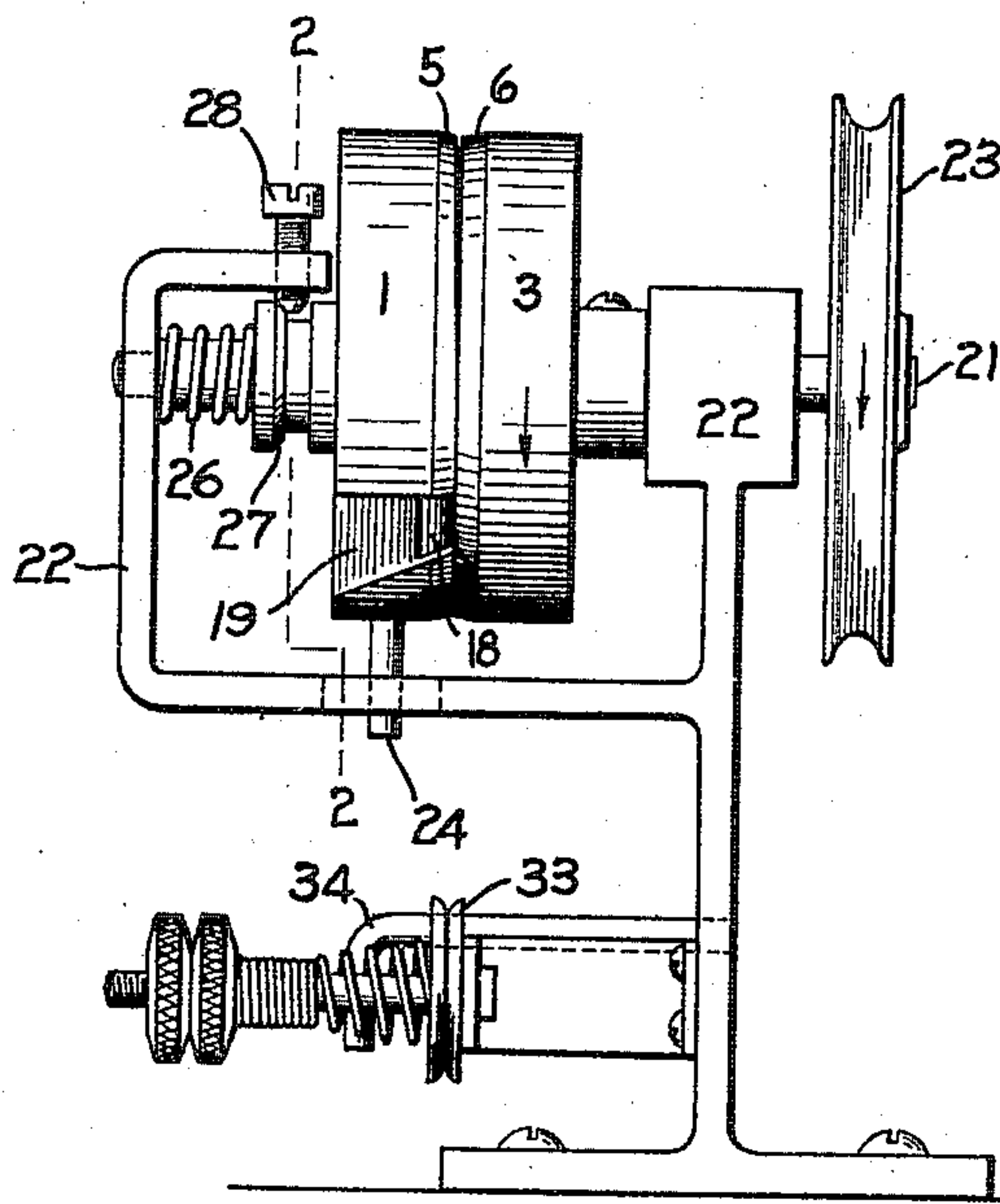


FIG. 2.

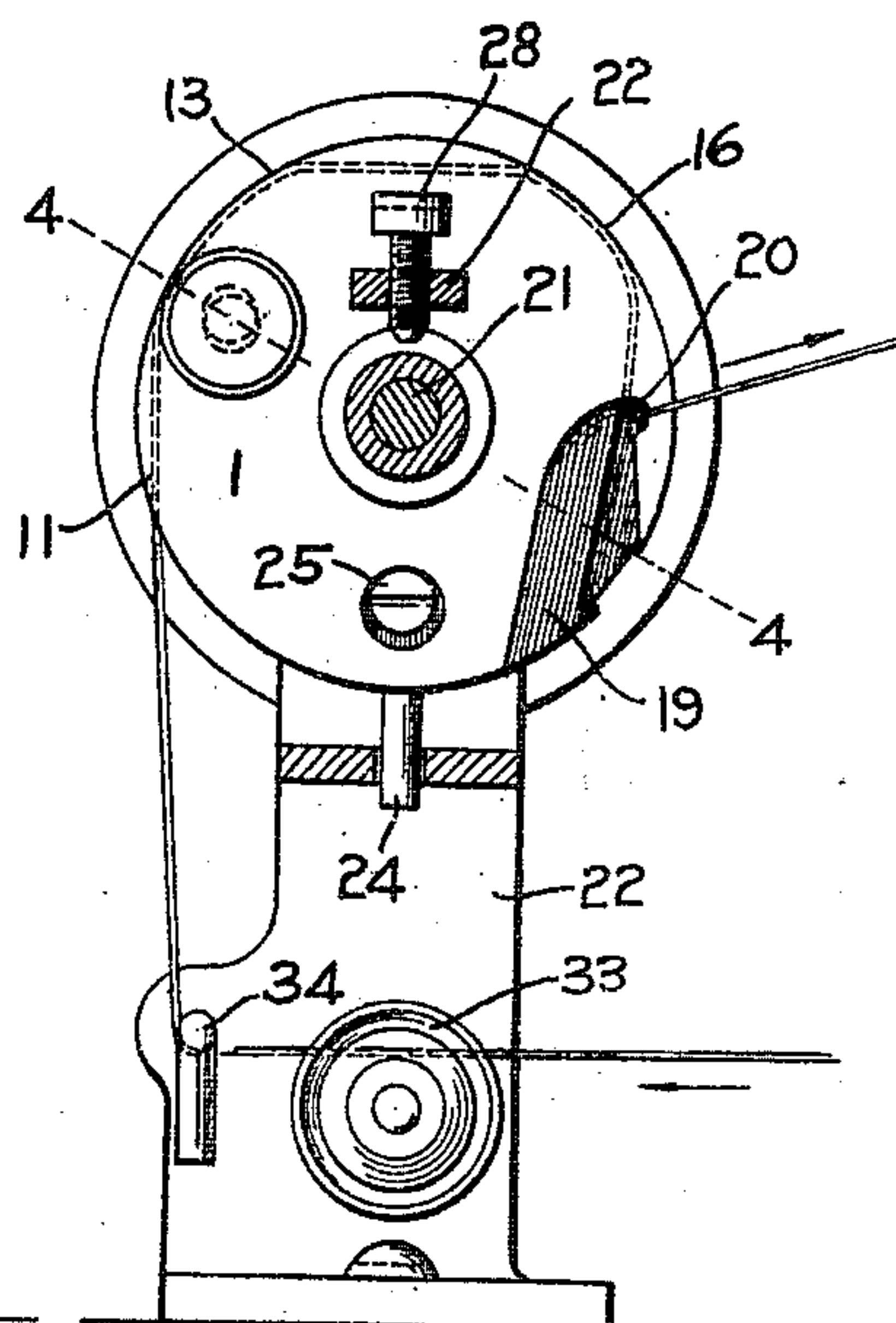


FIG. 3.

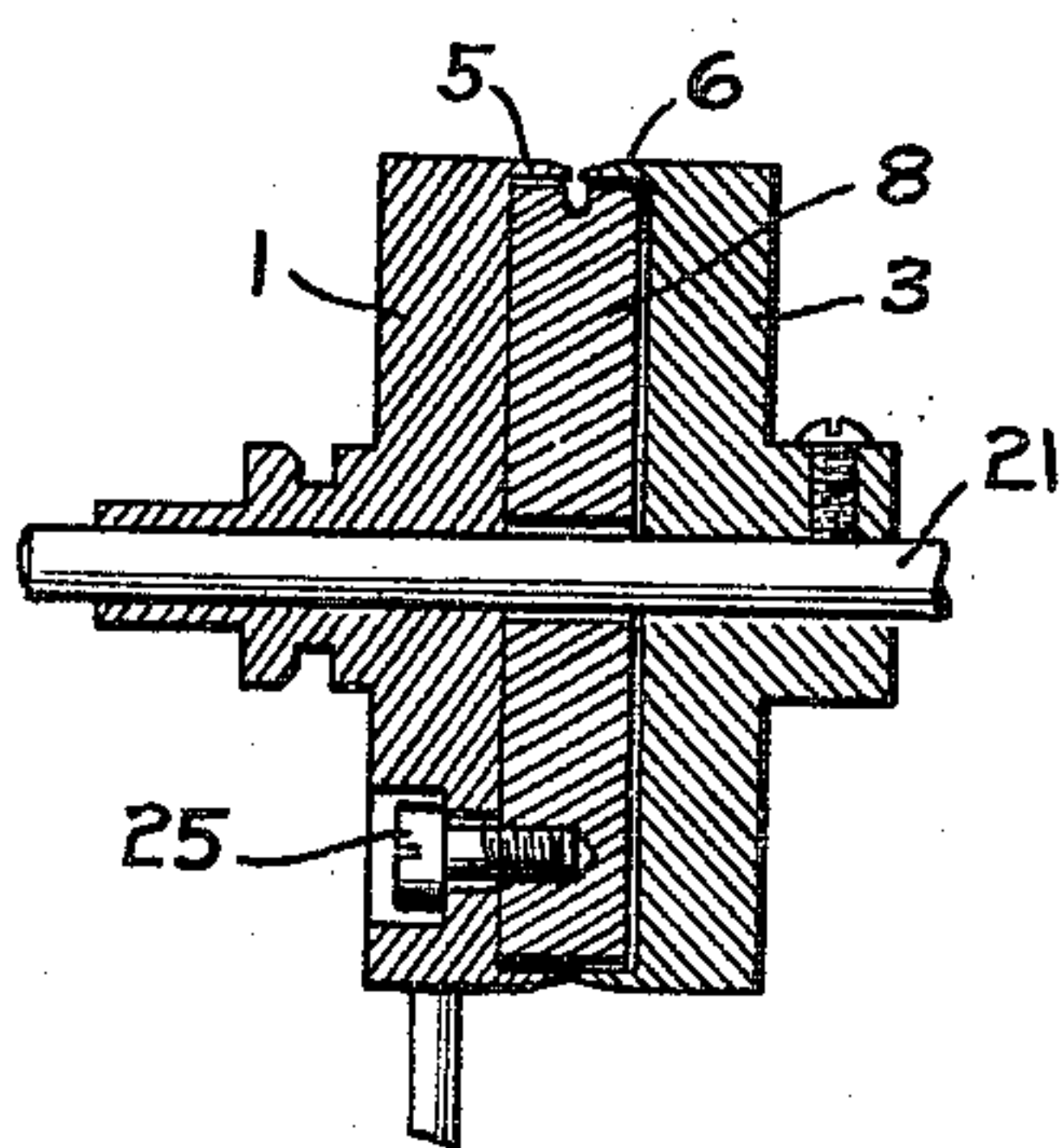


FIG. 4.

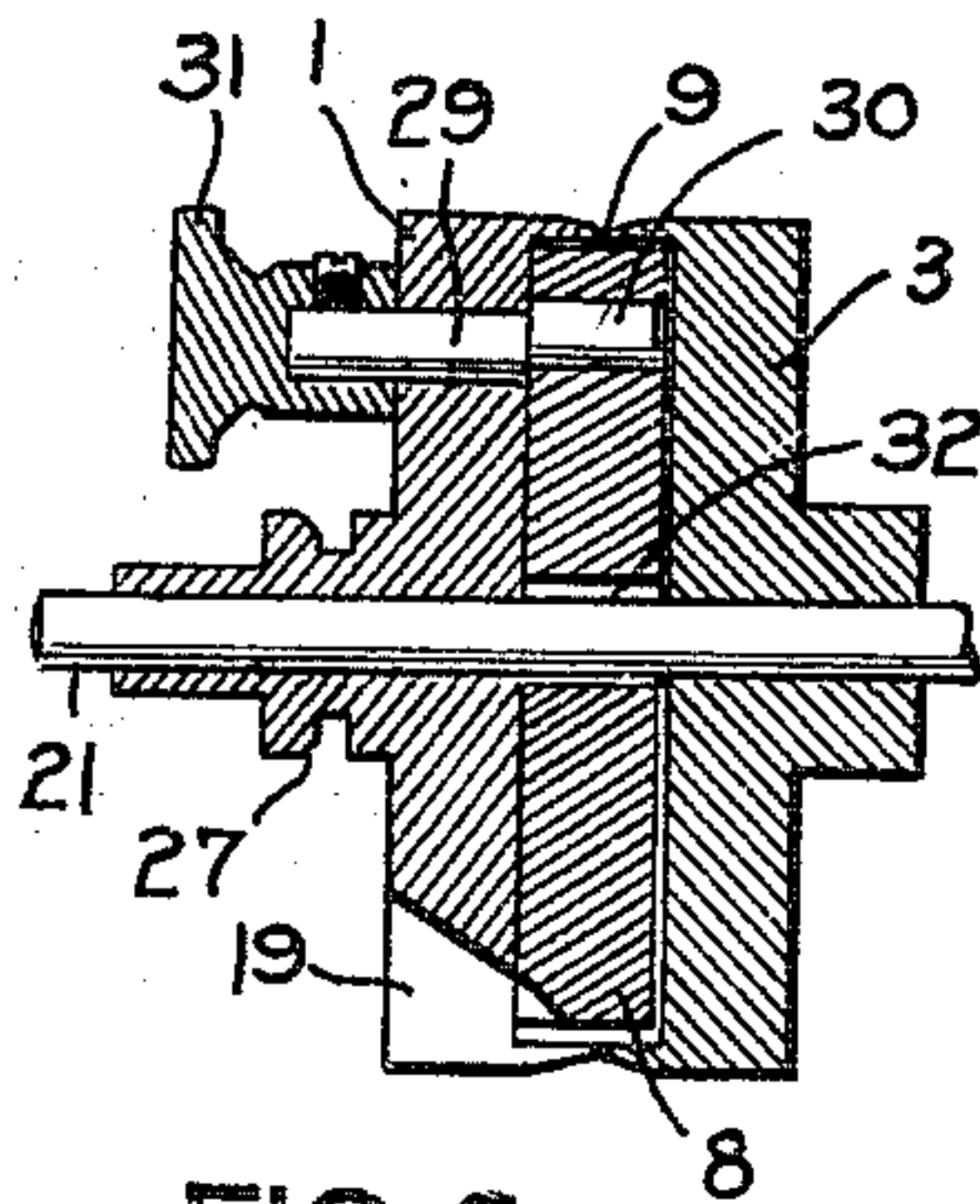


FIG. 5.

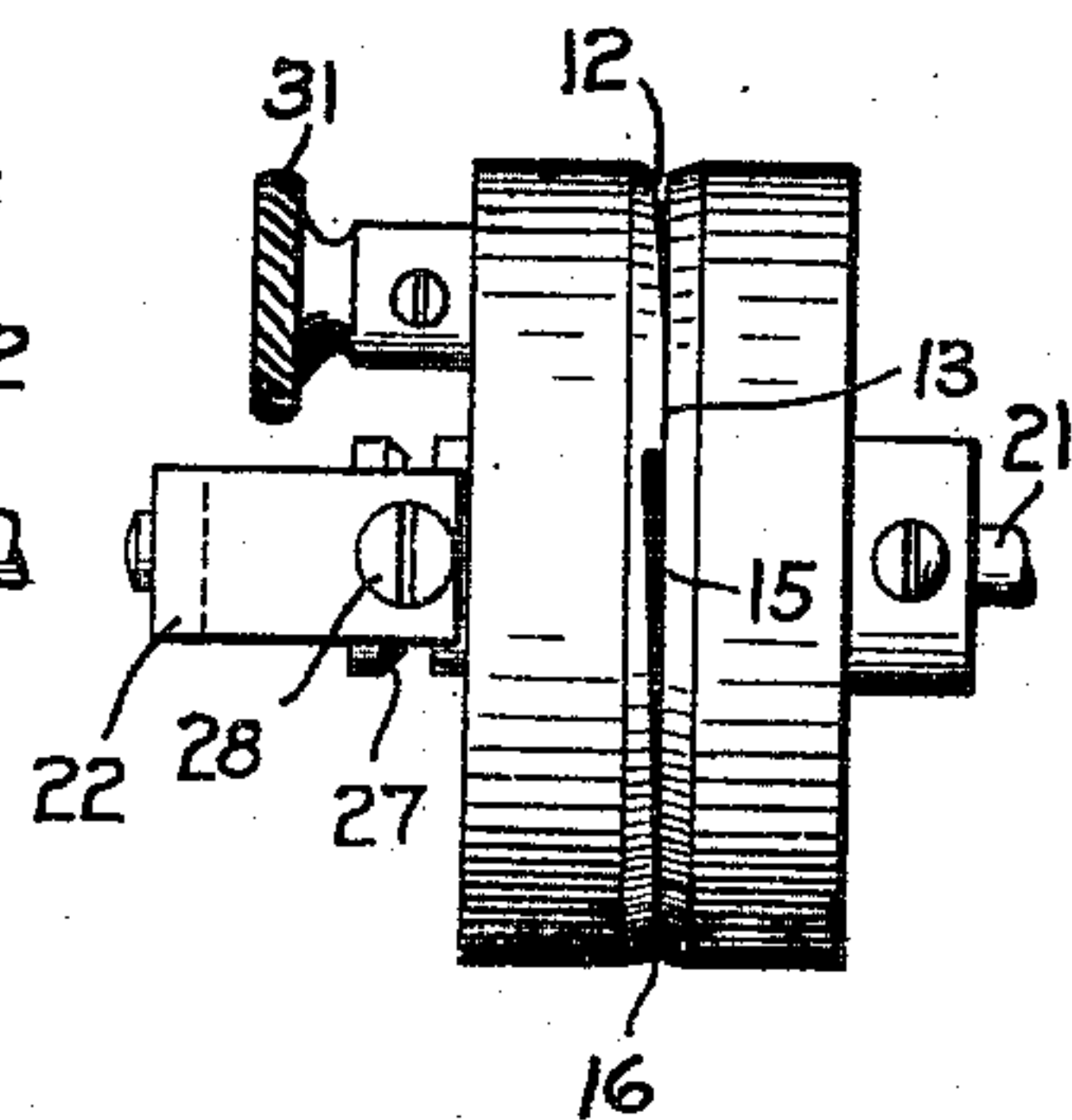


FIG. 7.

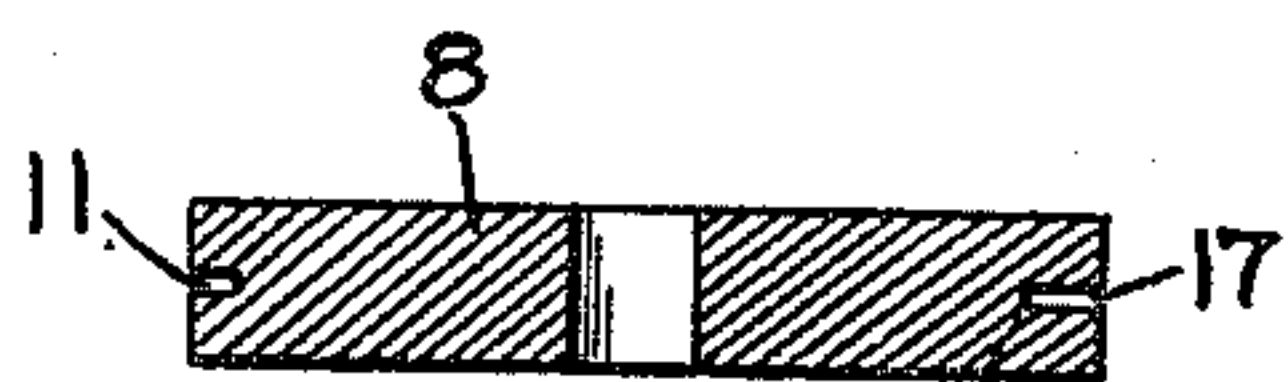


FIG. 6.

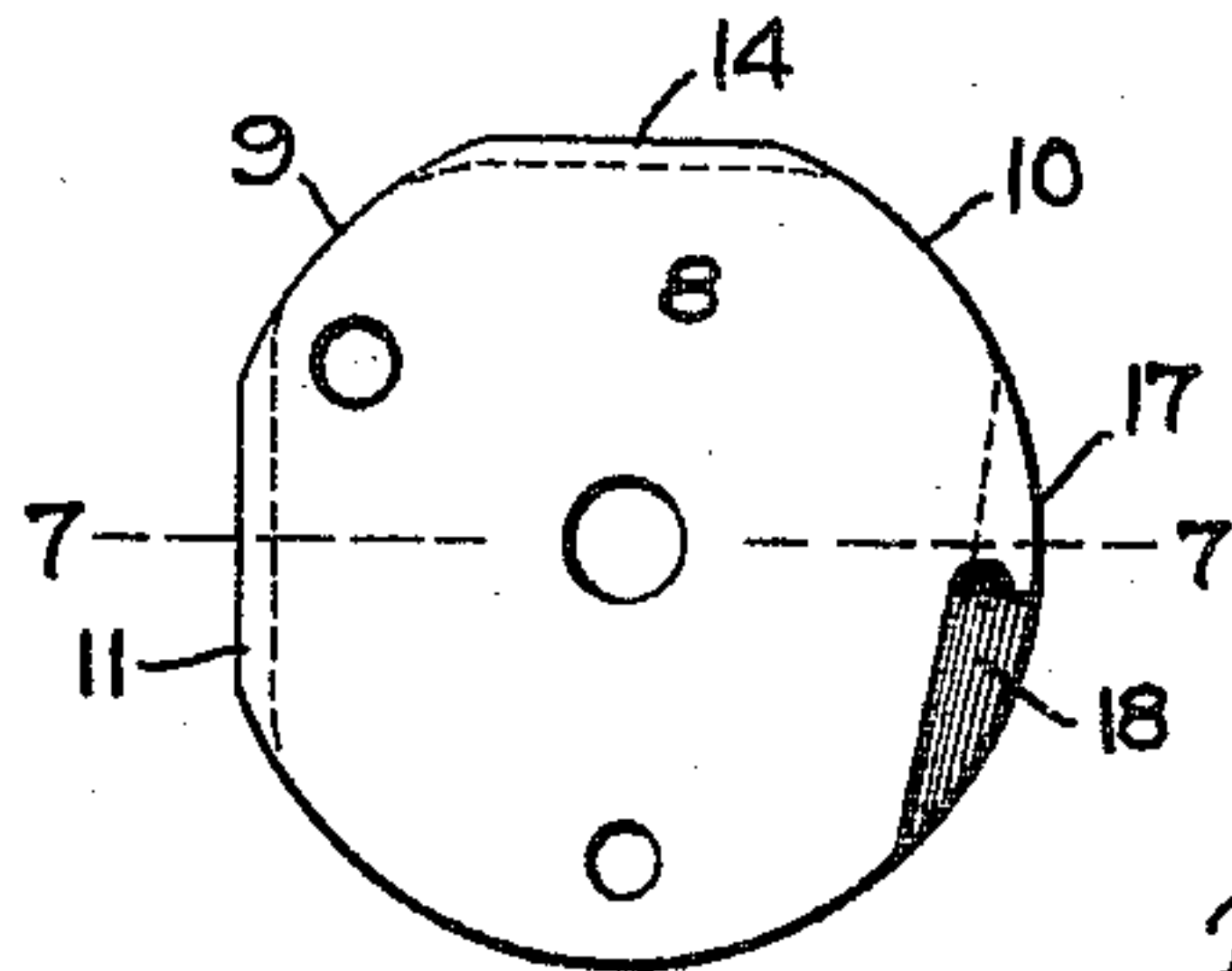


FIG. 8.



WITNESSES:

L. Thon
C. W. Carroll

INVENTORS

John P. Garey
Jefferson S. Lowman
by their attorneys
Osgood, Davis & Dorsey

UNITED STATES PATENT OFFICE.

JOHN P. GAREY AND JEFFERSON S. LOWMAN, OF ELMIRA HEIGHTS, NEW YORK.

YARN-CLEANER.

983,040.

Specification of Letters Patent.

Patented Jan. 31, 1911.

Application filed February 19, 1910. Serial No. 544,940.

To all whom it may concern:

Be it known that we, JOHN P. GAREY and JEFFERSON S. LOWMAN, citizens of the United States, and residents of Elmira Heights, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Yarn-Cleaners, of which the following is a specification.

Our invention relates to devices for removing slubs, burs, and the like from yarn, in the process of manufacture of the yarn.

One object of the invention is to produce a simple and efficient device of this character which shall operate without subjecting the yarn to any substantial tension in its passage through the machine, and to this end we impart a continuous movement to one of the cleaning blades, and thereby cause the blades to remove imperfections from the yarn by the power of the moving blade rather than by the power applied to the yarn to draw it through the machine.

Another object of the invention is to produce a yarn cleaner which shall be adjustable to operate upon yarns of different sizes, and to this end we employ an arrangement of blades and yarn support having provision for adjustment in several directions, which will be hereinafter more particularly described.

Other objects and features of the invention will be disclosed in connection with the following description of the illustrated embodiment of the invention.

In the accompanying drawings, which illustrate the preferred embodiment of our invention, Figure 1 is a front elevation of a complete yarn-cleaning machine; Fig. 2 is a side elevation shown in section on the line 2—2 in Fig. 1, looking from left to right; Fig. 3 is a vertical axial section of the operative instrumentalities of the machine illustrated in Fig. 1, looking from front to rear; Fig. 4 is a section on the line 4—4 in Fig. 2, looking from above, and showing the operative instrumentalities of the machine; Fig. 5 is a detail view of the same parts, looking in the same direction as in Fig. 4, but shown in full; Fig. 6 is a side elevation of the yarn guide; Fig. 7 is a section of the yarn guide on the line 7—7 in Fig. 6, looking from above; and Fig. 8 is a plan view of the yarn guide.

The operative instrumentalities of the illustrated embodiment of our invention

comprise two blades and a yarn guide. The blades have edges 5 and 6 of generally-cylindrical form, and one of the blades, designated by the reference number 1, is fixed, while the other blade 3 rotates about its cylindrical axis.

The yarn guide 8 is mounted within the cylindrical edges of the blades, as shown particularly in Figs. 3 and 4. The edge 6 of the rotary blade is continuous, but the edge 5 of the fixed blade is cut away at two points, 12 and 15, to form inclined portions, as shown particularly in Fig. 5. These inclined portions form acute angles with the edge of the rotary blade, and at the points 13 and 16 where the inclined portions of the edge 5 terminate the blades come almost into contact with each other. The yarn occupies a position within the edges 5 and 6 while it is being operated upon, and it enters this space at the part 12 of the fixed blade, where the space between the edges is sufficient to permit its entrance. At this point the yarn guide 8 is provided with a slot 11 which guides the yarn, and permits it to move clear of the edges of the blades until it reaches the upper end of the slot. This slot is of a width substantially equal to the diameter of the yarn, and it operates to force slubs or wood fibers and other imperfections in the yarn outwardly toward the edges of the blades. The depth of the slot gradually diminishes to its upper end, so that the bottom of the slot makes an acute angle with the blade edges, and after the yarn leaves the slot, it moves upon a smooth cylindrical portion 9 of the yarn guide which approaches close to the edges 5 and 6 at the point 13 where they come close to each other. The space between the part 9 of the guide and the blade edges is sufficient to receive the body of the yarn, but the imperfections projecting outwardly therefrom are drawn between the edges, and project wholly outside of the edges, and at the point 13 they are securely held by the edges. Beyond this point a second slot 14 is formed in the top of the yarn guide, this slot being merged gradually into the surface 9, as shown in Fig. 6, and the yarn in entering the slot, is drawn gradually away from the edges, so as to be separated from the imperfections which are held by, and upon the outer surfaces of the blades. The yarn, after passing through this slot, passes over another smooth cylindrical portion 10 of the guide, which

brings it again into operative relation with the blade edges at the point 16, so that the cleaning operation is repeated. The yarn then passes into a third slot 18 in the yarn guide, from which it issues through a lateral opening 19 in the fixed blade. A notch 20 in the fixed blade serves as a guide to the yarn as it issues from the machine.

To permit the rotary motion of the movable blade 3, by which the above described operation is facilitated, the blade is mounted upon a shaft 21 journaled in the frame 22 of the machine. A pulley 23, fixed to the shaft, is connected with any suitable source of power, and is rotated in the direction indicated by the arrows in Fig. 1, so as to cause the edge of the blade 3 to move in the same direction in which the yarn moves through the machine, but at a higher speed.

The fixed blade 1 is mounted, for convenience, upon the shaft 21, but is secured against rotation by means of a pin 24 engaging a slot in the frame 22.

To insure against breakage of the yarn, which might occur in case a particularly large or hard obstruction were to resist the action of the blades, the fixed blade is mounted yieldingly to permit it to slide upon the shaft 21 away from the rotating blade. To this end a spring 26 is interposed between the fixed blade and the frame 22. The normal position of the fixed blade is controlled, however, by an adjusting screw 28, having a beveled end which engages a beveled collar 27 on the fixed blade. By means of this screw the fixed blade may be adjusted upon the shaft 21 until its edge comes close to the edge of the rotary blade, as is desirable for the best operation, but without permitting the edges to actually engage each other. When the blades are sharpened, they may be readjusted by means of the screw 28 to preserve the proper relative position of their edges.

In order to adapt the machine to operate upon yarns of different diameters, it is necessary to adjust the distance between the smooth portions 9 and 10 of the yarn guide and the inner surfaces of the blade edges. To this end the yarn guide is attached to the fixed blade 1 by a screw 25 threaded in the yarn guide and passing through a slot in the fixed blade. The yarn guide is also provided with an opening 32, through which the shaft 21 passes, this opening being larger than the shaft to permit transverse movement of the yarn guide. The adjusting device for the yarn guide comprises a stem 29 journaled in the fixed blade, and having an eccentric portion 30 engaging a hole in the yarn guide. A milled head 31 on the stem 29 is used to turn the stem. When it is necessary to adjust the yarn guide, the screw 25 is loosened and the head 31 is turned, thereby raising or lowering the yarn guide and

moving the smooth portions 9 and 10 of the guide simultaneously, and to substantially equal degrees, toward or from the inner surfaces of the blades. This adjustment is preferably so made as to leave a space between the yarn guide and the blade-edges substantially equal to the diameter of the yarn.

In addition to the parts above described, the machine is provided with a tension device 33, of well known form, for maintaining the proper tension on the yarn during its passage through the machine, and from the tension device the yarn passes around a hook 34 and thence to the blades. The machine is not provided with means for drawing the yarn through the operative instrumentalities, as it is intended to be used in connection with ordinary spooling or winding devices of any suitable form.

The rotation of the movable blade of our machine not only facilitates the removal of imperfections from the yarn, but it also facilitates the passage of the yarn through the machine, so that it is not necessary to subject the yarn to any substantial tension beyond what is required to keep it taut between the machine and the reel or spool upon which it is wound. In this way, breakage of the yarn, such as frequently occurs in other yarn cleaning machines, is avoided, and the yarn is not subjected to any harmful stretching. The particles removed from the yarn issue upon the outer surfaces of the blades, and, by the rotation of the movable blade, they are thrown off from the machine, so that the machine does not become clogged during long-continued operation.

While the edges of the blades are shown as beveled so as to be thin at their extremities, it is not necessary that the edges be very sharp, since the rotation of the movable blade so facilitates the operation of the blades that they are effective even though dull. For the same reason it is not necessary to sharpen the edges often.

Our invention is not limited to the embodiment hereinbefore described and illustrated in the accompanying drawings, but may be embodied in various other forms within the nature of the invention as it is defined in the following claims.

We claim:—

1. A yarn cleaner having, in combination, two blades arranged with opposed edges forming an acute angle and substantially meeting but not crossing each other, means for imparting to one blade a substantially continuous movement in the direction of the length of its edge, and means for guiding the yarn adjacent to the proximate parts of the edges.

2. A yarn cleaner having, in combination, two blades arranged with opposed edges forming an acute angle and substantially meeting but not crossing each other, one of

the blades having an endless circular edge, means for rotating said blade, and means for guiding yarn adjacent to the proximate parts of the edges.

5 3. A yarn cleaner having, in combination, two blades arranged with opposed edges forming an acute angle and substantially meeting but not crossing each other, one of the blades being adjustable toward and from
10 the other to vary the distance between the edges, means for imparting to one blade a substantially continuous movement in the direction of the length of its edge, and means for guiding yarn adjacent to the
15 proximate parts of the edges.

4. A yarn cleaner having, in combination, two blades arranged with opposed edges forming an acute angle and substantially meeting but not crossing each other, means
20 for imparting to one blade a substantially continuous movement in the direction of the length of its edge, and a yarn guide arranged adjacent to the proximate parts of the edges and adjustable toward and from the edges.

25 5. A yarn cleaner having, in combination, two blades arranged with opposed edges forming an acute angle and substantially meeting but not crossing each other, means for imparting to one blade a substantially
30 continuous movement in the direction of the length of its edge, and a yarn guide arranged adjacent to the proximate parts of the edges and having a slot to receive the yarn.

35 6. A yarn cleaner having, in combination, two blades arranged with opposed edges forming an acute angle and substantially meeting but not crossing each other, means for imparting to one blade a substantially
40 continuous movement in the direction of the length of its edge, and a yarn guide ar-

ranged adjacent to the proximate parts of the edges and having a slot to receive the yarn, the bottom of the slot being arranged to approach the edges at an acute angle. 45

7. A yarn cleaner having, in combination, two blades arranged with opposed edges, one of the blades having a continuous circular edge and the other blade having an edge with a plurality of portions inclined toward
50 the edge of the first mentioned blade, means for rotating the blade with the circular edge, and means for guiding yarn adjacent to the proximate parts of the edges.

8. A yarn cleaner having, in combination, 55 two blades with edges of generally-cylindrical form, the blades being arranged with their edges opposed, means for rotating one blade, and a yarn guide arranged within the blade edges in position to guide yarn adja- 60 cent to the inner surfaces of the edges.

9. A yarn cleaner having, in combination, two blades with edges of generally-cylindrical form, the blades being arranged with their edges opposed, means for rotating one
65 blade, resilient means for maintaining the blades in operative relation, and means for guiding yarn adjacent to the blade edges.

10. A yarn cleaner having, in combination, two blades with edges of generally-cy- 70 lindrical form, the blades being arranged with their edges opposed, means for rotating one blade, resilient means for maintaining the blades in operative relation, adjust- 75 able means for limiting the movement of the blades toward each other, and means for guiding yarn adjacent to the edges.

JOHN P. GAREY.

JEFFERSON S. LOWMAN.

Witnesses:

ROLAND H. OSBORNE,

JAMES J. BALDWIN.