

No. 865,533.

PATENTED SEPT. 10, 1907.

D. H. ROWE.
CYLINDER BORING DEVICE.
APPLICATION FILED DEC. 10, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

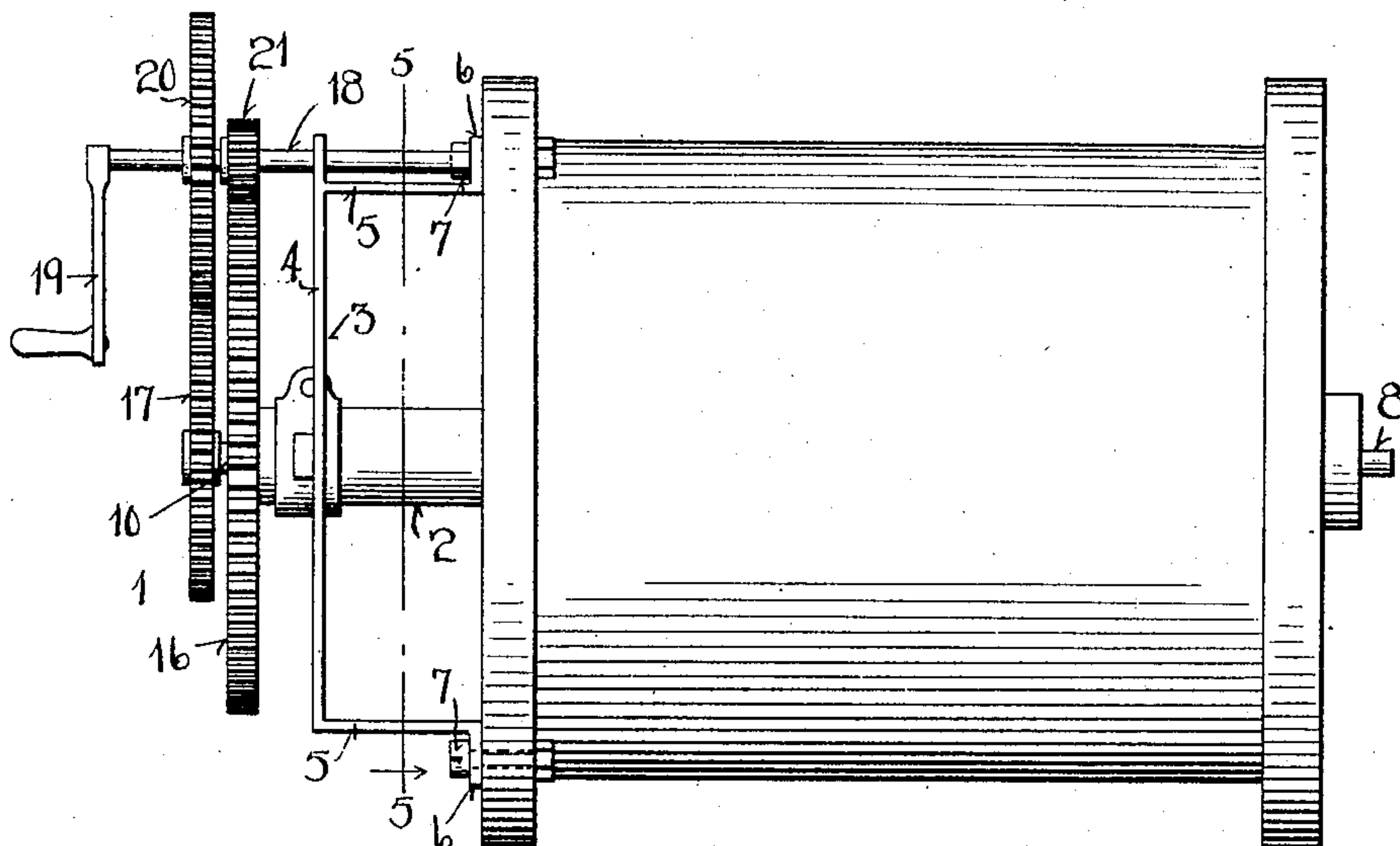


Fig. 2.

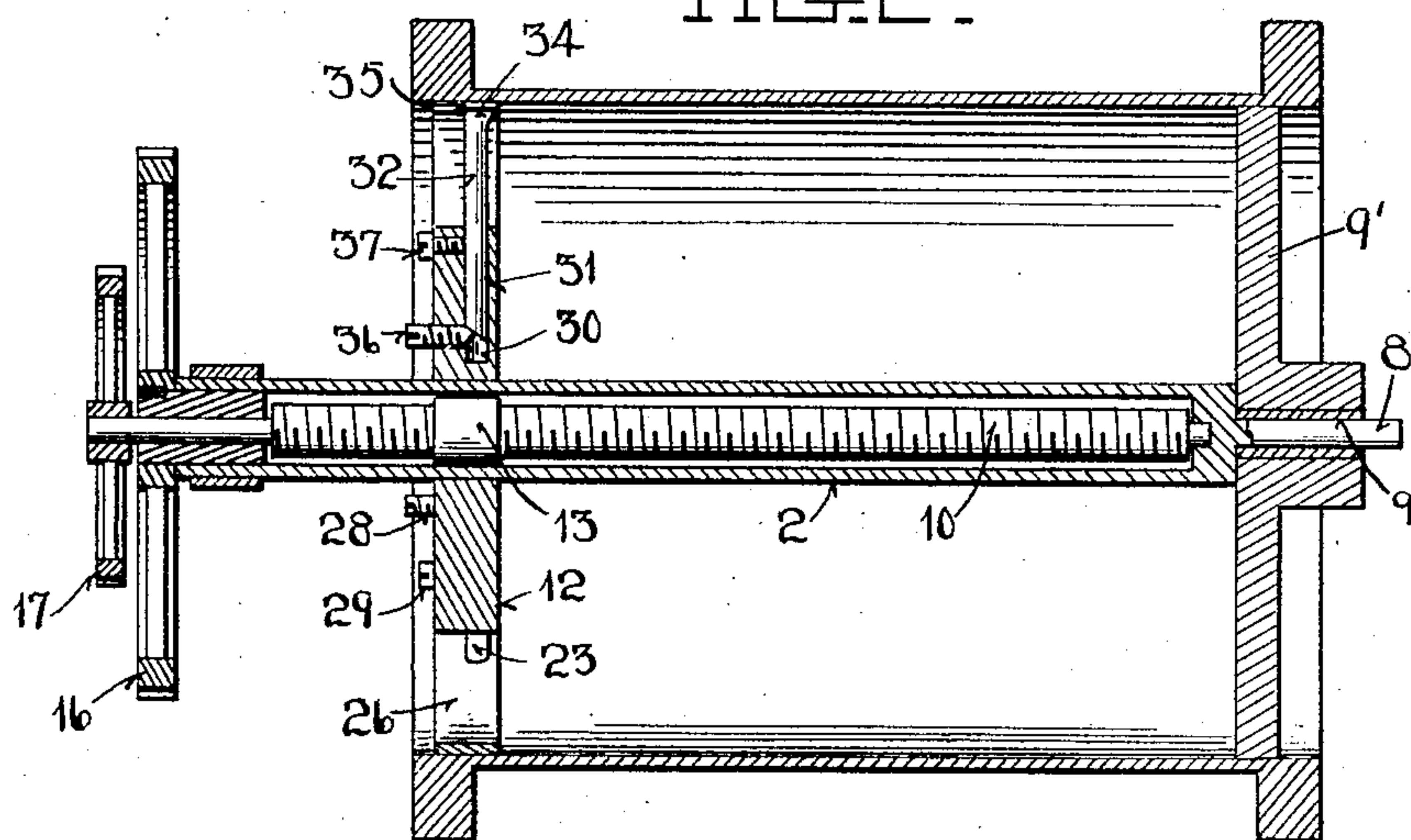
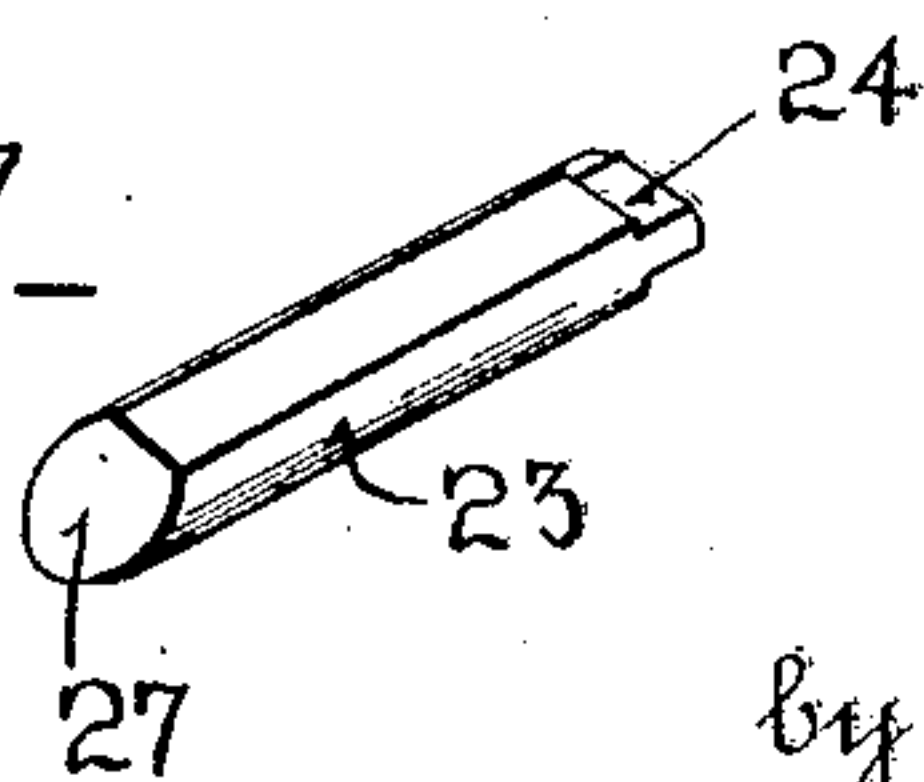


Fig. 7.

Witnesses
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2 SHEETS—SHEET 2.

Fig. 3.

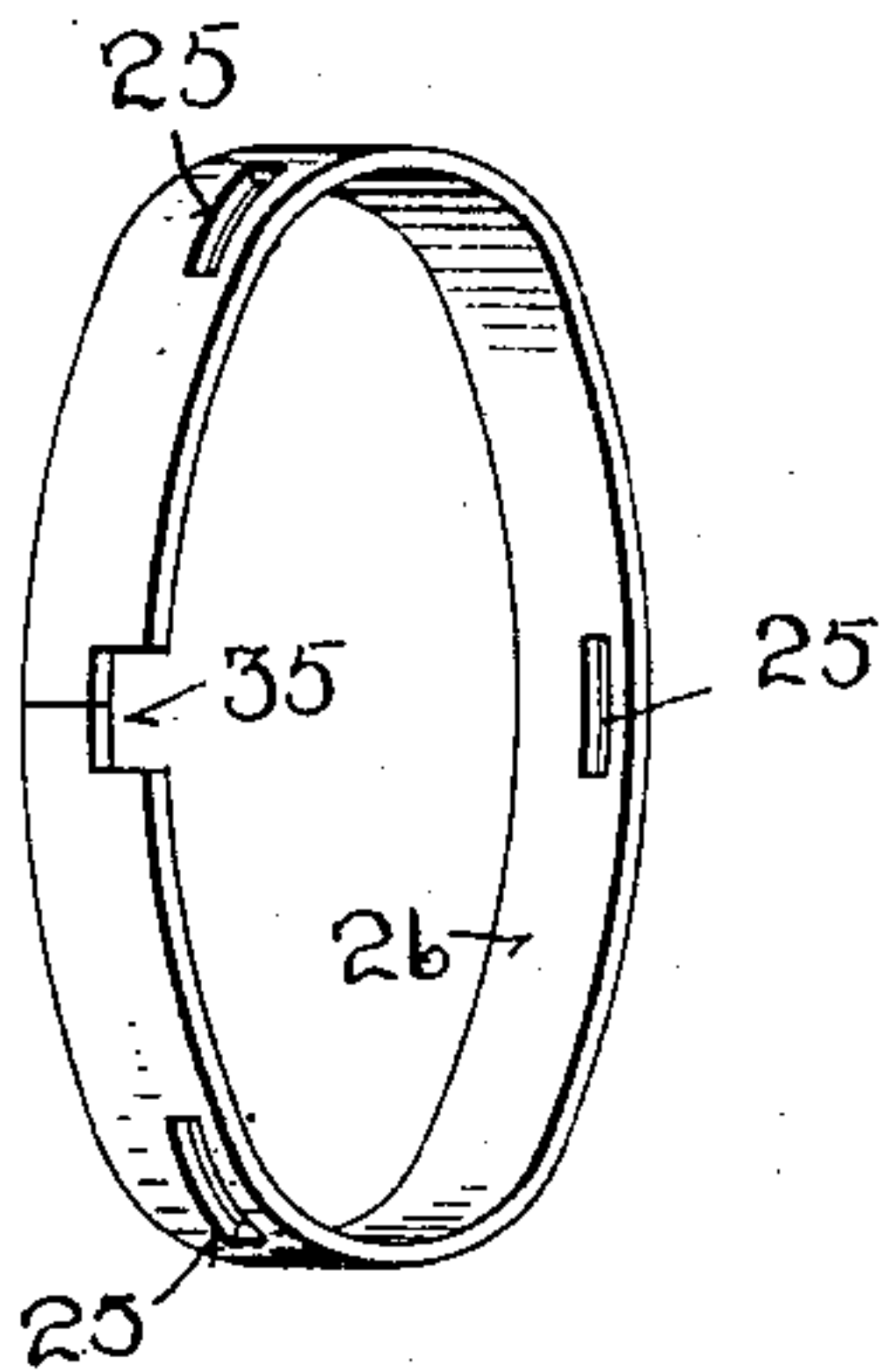
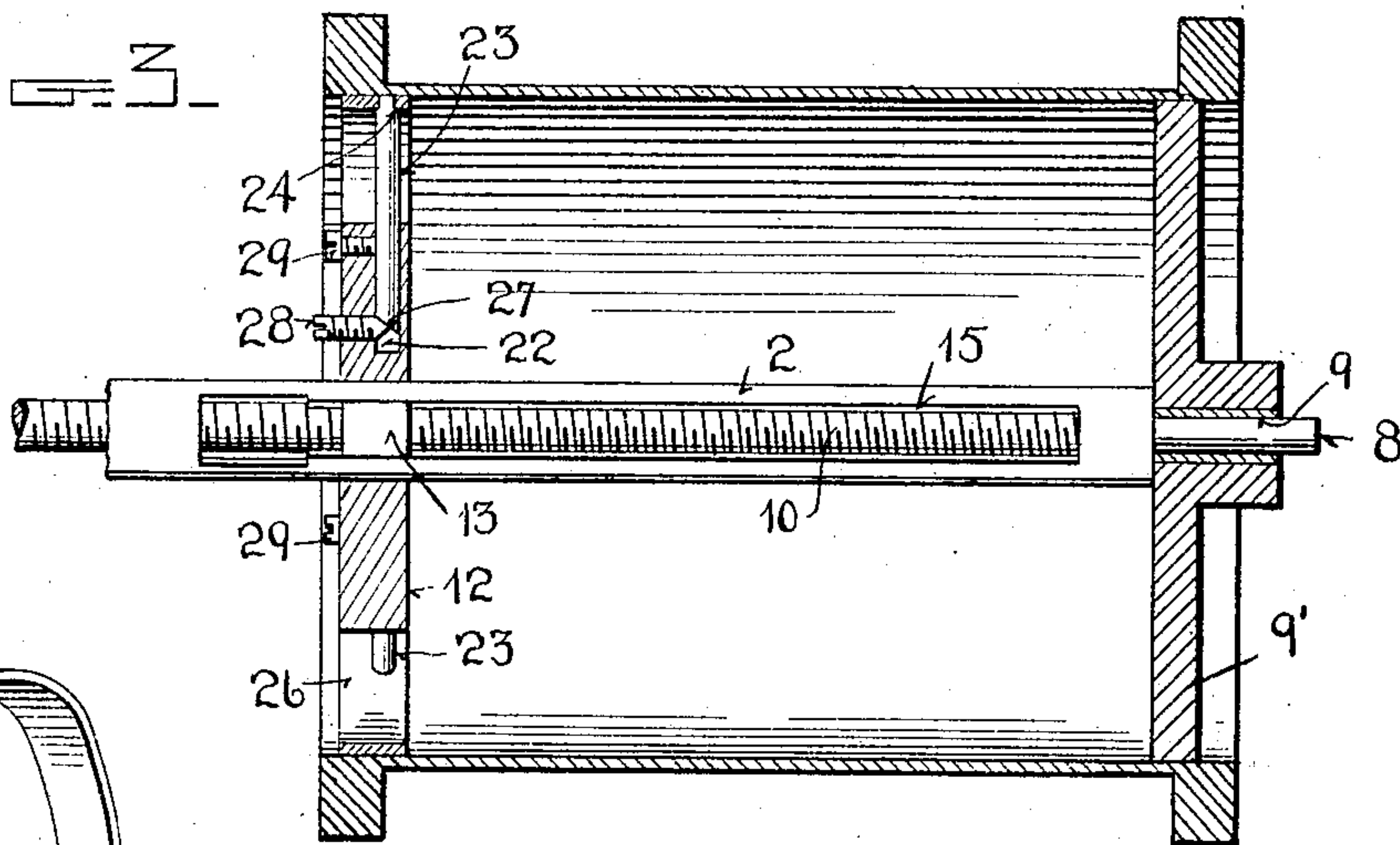


Fig. 5.

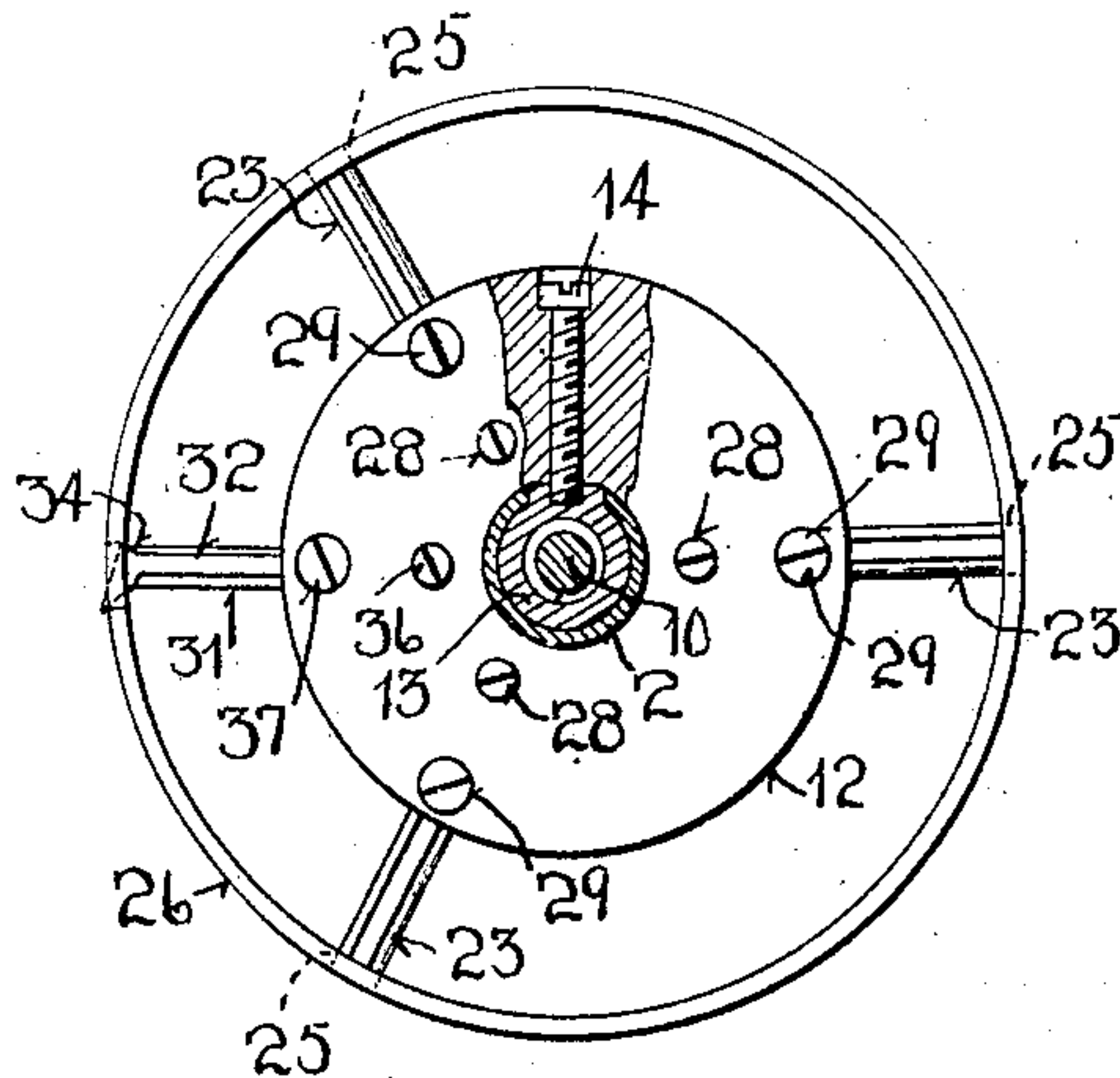


Fig. 6.

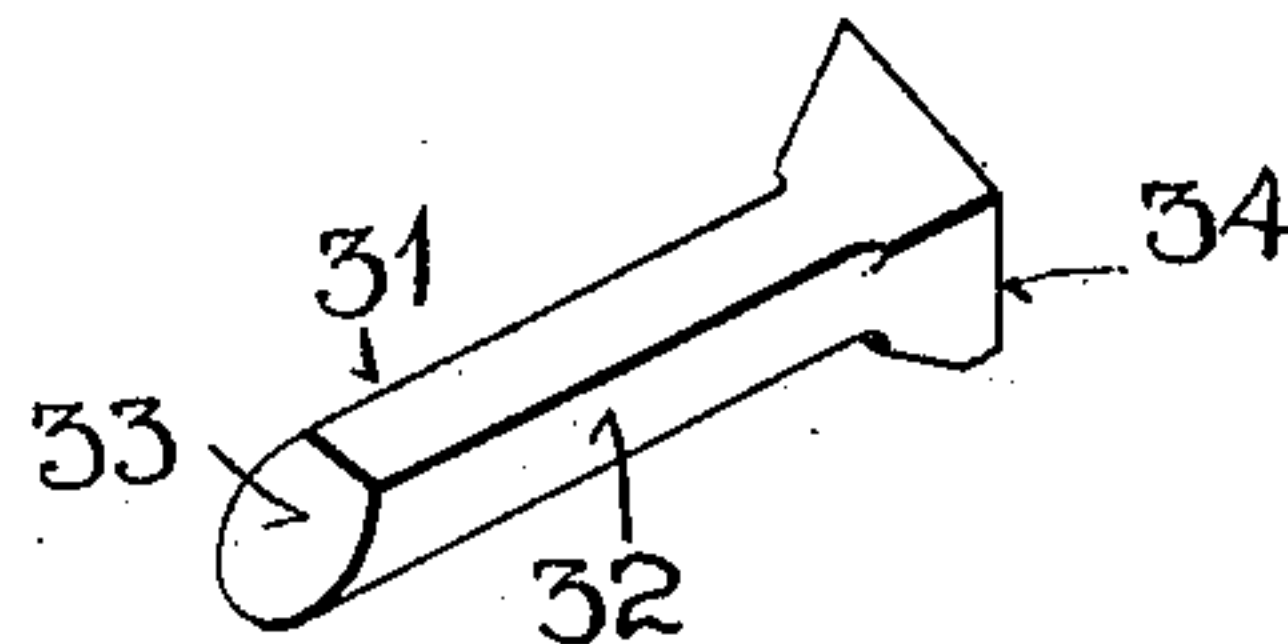
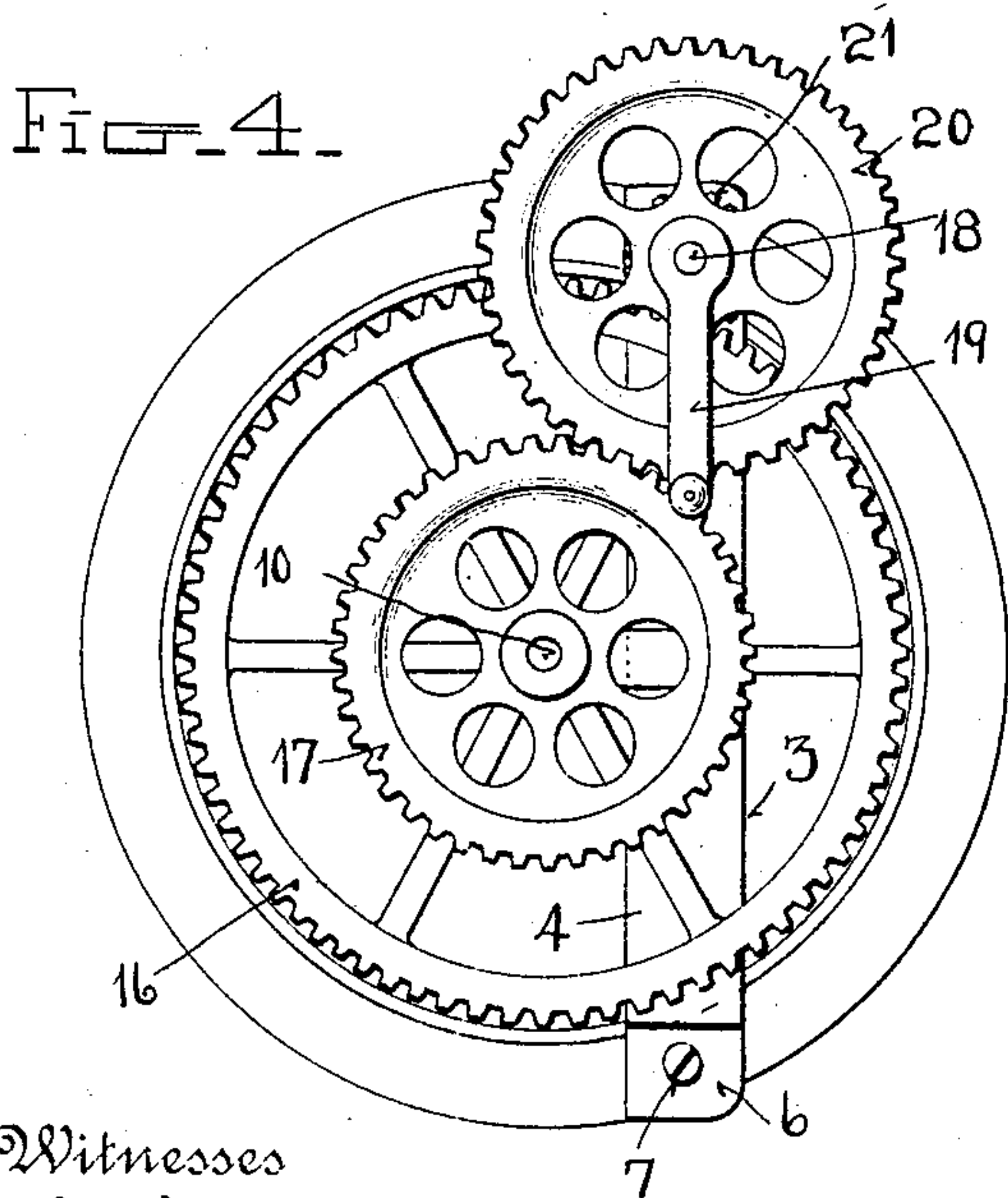


Fig. 7.



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UNITED STATES PATENT OFFICE.

DANIEL H. ROWE, OF GREENUP, ILLINOIS.

CYLINDER-BORING DEVICE.

No. 865,533.

Specification of Letters Patent.

Patented Sept. 10, 1907.

Application filed December 10, 1906. Serial No. 347,110.

To all whom it may concern:

Be it known that I, DANIEL H. ROWE, a citizen of the United States, residing at Greenup, in the county of Cumberland and State of Illinois, have invented certain new and useful Improvements in Cylinder-Boring Devices; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

10 This invention relates to improvements in cylinder boring tools.

The object of the invention is to provide a boring tool of this character by means of which engine cylinders and the like may be bored out without removing the same from their beds or bases.

A further object is to provide a device of this character having means arranged thereon to hold and steady the tool as the same is operated.

20 With the above and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts, as will be hereinafter described and claimed.

In the accompanying drawings:—Figure 1 is a side view of a cylinder, showing the application of the tool thereto; Fig. 2 is a longitudinal vertical sectional view of the cylinder and tool, taken on a line with the cutter; Fig. 3 is a similar view of the cylinder and a portion of the tool, taken on a line with one of the expanding arms or bars which support the expansible holding ring; Fig. 4 is an end view of the tool; Fig. 5 is a cross sectional view on the line 5—5 of Fig. 1, looking toward the cutting head parts of the latter being shown in section; Fig. 6 is a detail view of the cutter removed from the cutting head; Fig. 7 is a similar view of one of the expanding arms or bars which support the expansible holding ring; and Fig. 8 is a detail perspective view of the expansible holding and guiding ring.

Referring more particularly to the drawings, 1 denotes the tool, which comprises a hollow shaft 2. The outer end of the shaft 2 is journaled in a supporting frame 3, which is here shown as consisting of a transversely-disposed plate or bar 4 bent at right angles at its opposite ends, as shown at 5, said right angularly-bent ends being provided at their inner ends with outwardly-bent apertured lugs 6. In the lugs 6 are arranged fastening bolts 7, by means of which the frame 3 is bolted to the end of a cylinder, as clearly shown in Fig. 1 of the drawings.

The inner end of the shaft 2 is provided with a reduced longitudinally-projecting centering pin 8, which is adapted to engage a centrally-disposed opening 9 formed in the inner end head 9' of the cylinder, said head being shown as being set inward a slight distance from the end of the cylinder body. Revolvably-mounted in the hollow shaft 2 is a feed screw 10, while slidably-

mounted on the outer side of the shaft 2 is a boring head 12. Adapted to work on the feed screw 10 is a cylindrical nut 13, the diameter of which is approximately the same as that of the inside of the shaft 2 in which the nut is adapted to travel when moved by the screw 10. The head 12 is secured to the nut 13 by means of a set screw 14 through a longitudinally-disposed slot 15 formed in one side of the hollow shaft 2 for this purpose. This connection of the head 12 and the nut 13 is clearly shown in Fig. 5 of the drawing.

On the outer end of the hollow sleeve 2 is fixedly-mounted a spur gear wheel 16, while on the outer end of the feed screw 10 is fixedly-mounted a smaller spur gear 17. Journaled in suitable bearings on the frame 3 is an operating shaft 18 on the outer end of which is arranged a crank handle 19. Fixedly-mounted on the shaft 18 is an outer gear wheel 20 adapted to mesh with the gear wheel 17 on the end of the feed screw. On the shaft 18 is also fixedly-mounted a spur gear pinion 21 adapted to engage the large gear wheel 16 on the hollow shaft. By turning the operating shaft 18, the feed screw and the hollow shaft of the tool will be driven through the gear wheel 20 and pinion 21, as will be understood. The pinion 21 being of considerably less size than the gear 20 will cause the hollow shaft and the boring head to be turned at less speed than the feed screw.

In the boring head 12 is formed a series of radially-disposed passages 22, in which are slidably-mounted radially-projecting expanding arms 23. The outer ends of the arms 23 are reduced to form squared shoulders 24 and said reduced ends are engaged with slots 25 formed in the expansive holding ring 26, which is open at one side to permit the same to be expanded or increased in size. The inner ends of the arms or bars 23 are beveled or inclined, as shown at 27, and with said beveled ends are adapted to be engaged the inner conical-shaped ends of adjusting screws 28 that are adapted to be screwed through the outer side of the boring head 10, as shown. By screwing the adjusting screws 28 inwardly, the expanding arms 23 will be forced outwardly, thus expanding the holding ring 26. When the ring 26 has been thus expanded to the desired extent, the arms 23 are locked or held in position by means of set screws 29, which are also screwed through the outer side of the boring head adjacent to the screws 28, and are adapted to engage the flattened upper side of the expanding arms 23.

In one side of the boring head 12 is formed a radially-disposed passage 30, in which is adjustably-mounted a cutter 31. This cutter 31 is provided with a shank 32 having a flattened upper side and a beveled inner end 33. On the outer end of the shank is formed a cutting head 34, which when the shank 32 is arranged in the passage 30 will lie in a recess 35 formed in the expansive holding ring and in position to engage and cut

the inner wall of the cylinder when the tool is operated. The cutter 31 is adjusted to the desired position by means of an adjusting screw 36 having a conical-shaped inner end to engage the beveled inner end 33 of the shank 32 of the cutter in the same manner as described in connection with the adjusting screws 28 for the expanding arms 23. The cutter is held rigidly in its adjusted position by means of a set screw 37 which is screwed through the outer side of the boring head adjacent to the adjusting screw 36.

In operation, the tool is secured to the cylinder as hereinbefore described, after which the cutter is adjusted to bring the cutting head 34 into the proper position for cutting the cylinder. The tool is now operated to cause the cutter to bore out the cylinder to a slight extent, after which the holding ring 36 is expanded in a manner hereinbefore described to engage the new bore of the cylinder, thereby holding and steadying the tool during the rest of the boring process. The expanding ring 32 is fed inwardly along with the boring head as will be understood. By providing the expansible holding ring a smooth even bore will be formed by the cutting head of the tool.

From the foregoing description, taken in connection with the accompanying drawings, the construction

and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention, as defined by the appended claims.

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

1. In a cylinder boring device, a boring head having radial guide openings provided therein, expander arms slidably arranged in said guide openings, an expansive ring sustained by said arms for engagement with the interior of the cylinder, and a radially projecting cutter adjustably mounted in the head.

2. In a cylinder boring device, a boring head, a plurality of radially movable expander arms carried by the head, an expansive ring applied to the outer ends of the arms and for movement thereby to engage the interior of the cylinder, means for fixing the arms in adjusted position, and a cutter carried by the head and projecting at its outer end through a seat in the ring.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

DANIEL H. ROWE.

Witnesses:

S. B. RARIDEN,
W. T. PAUL.