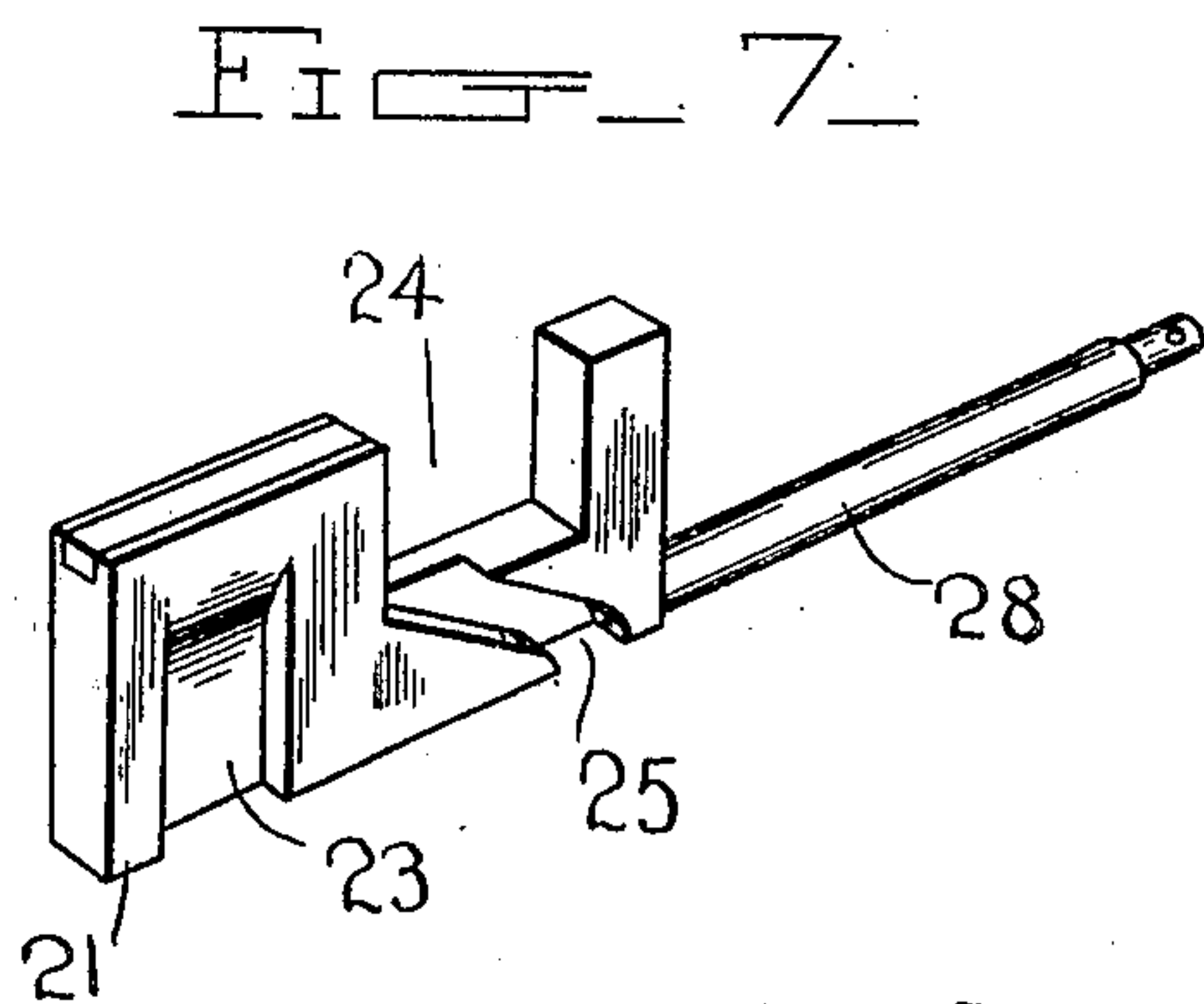
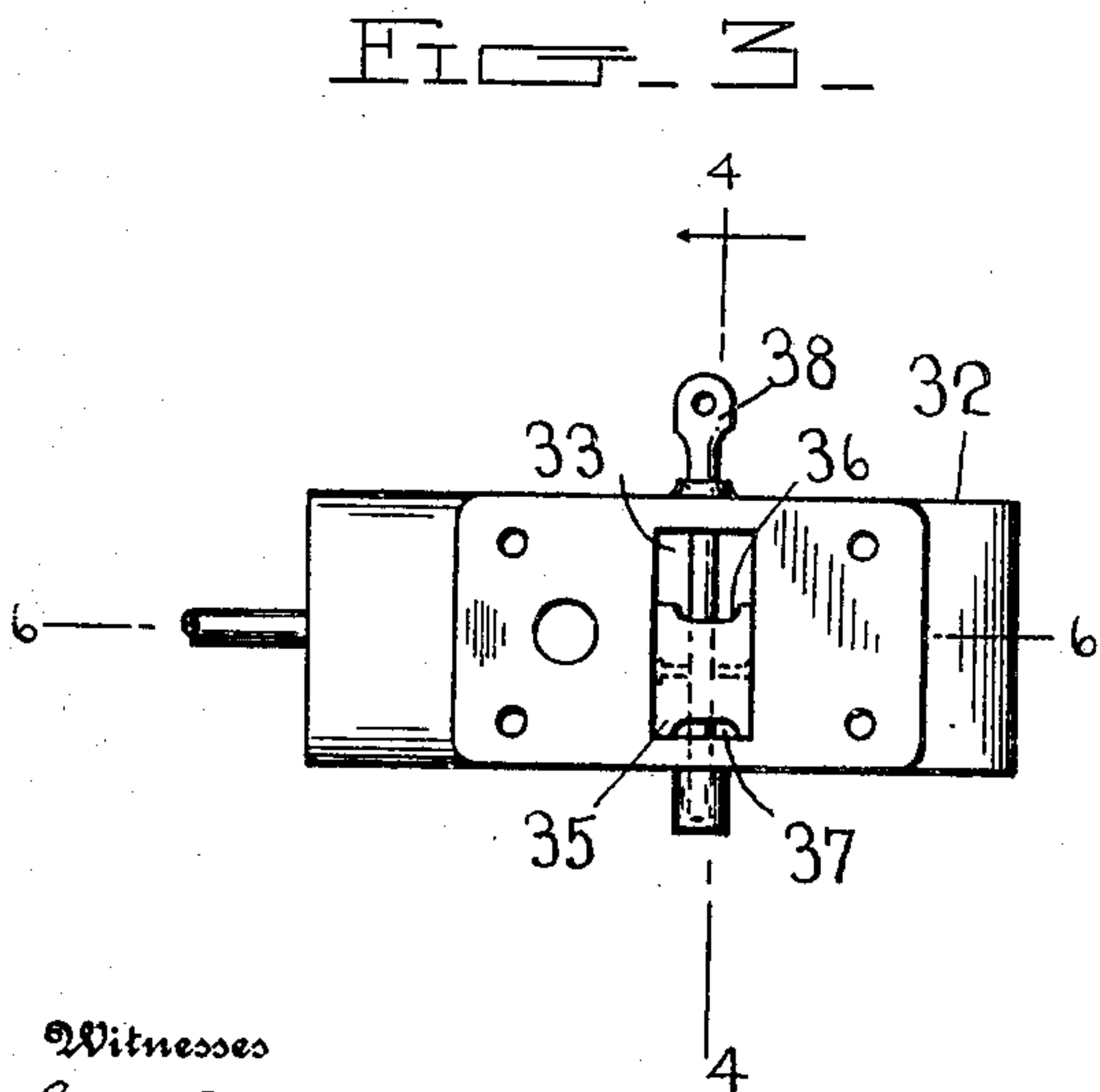
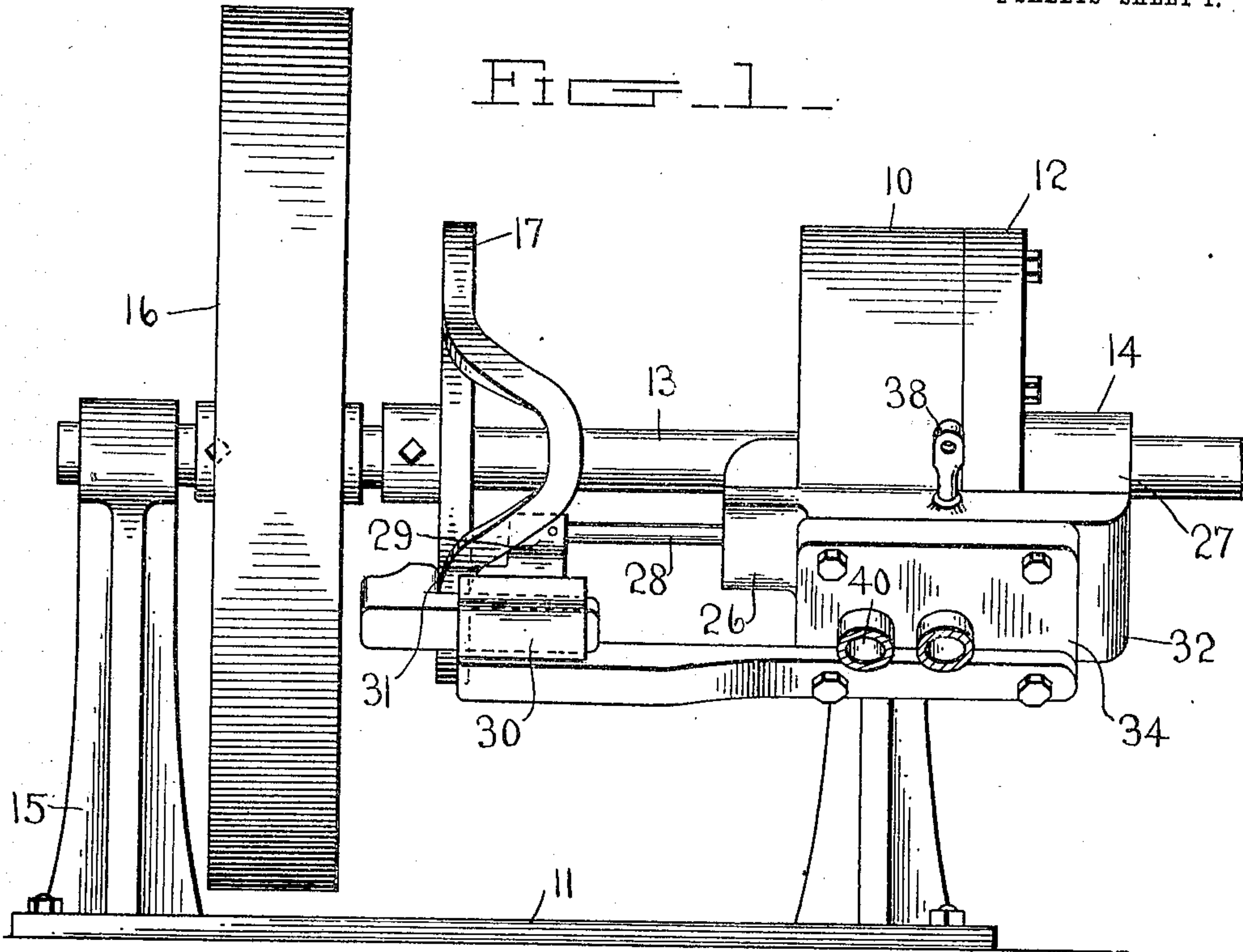


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 APPLICATION FILED SEPT. 28, 1908.

919,698.

Patented Apr. 27, 1909.
 2 SHEETS—SHEET 1.



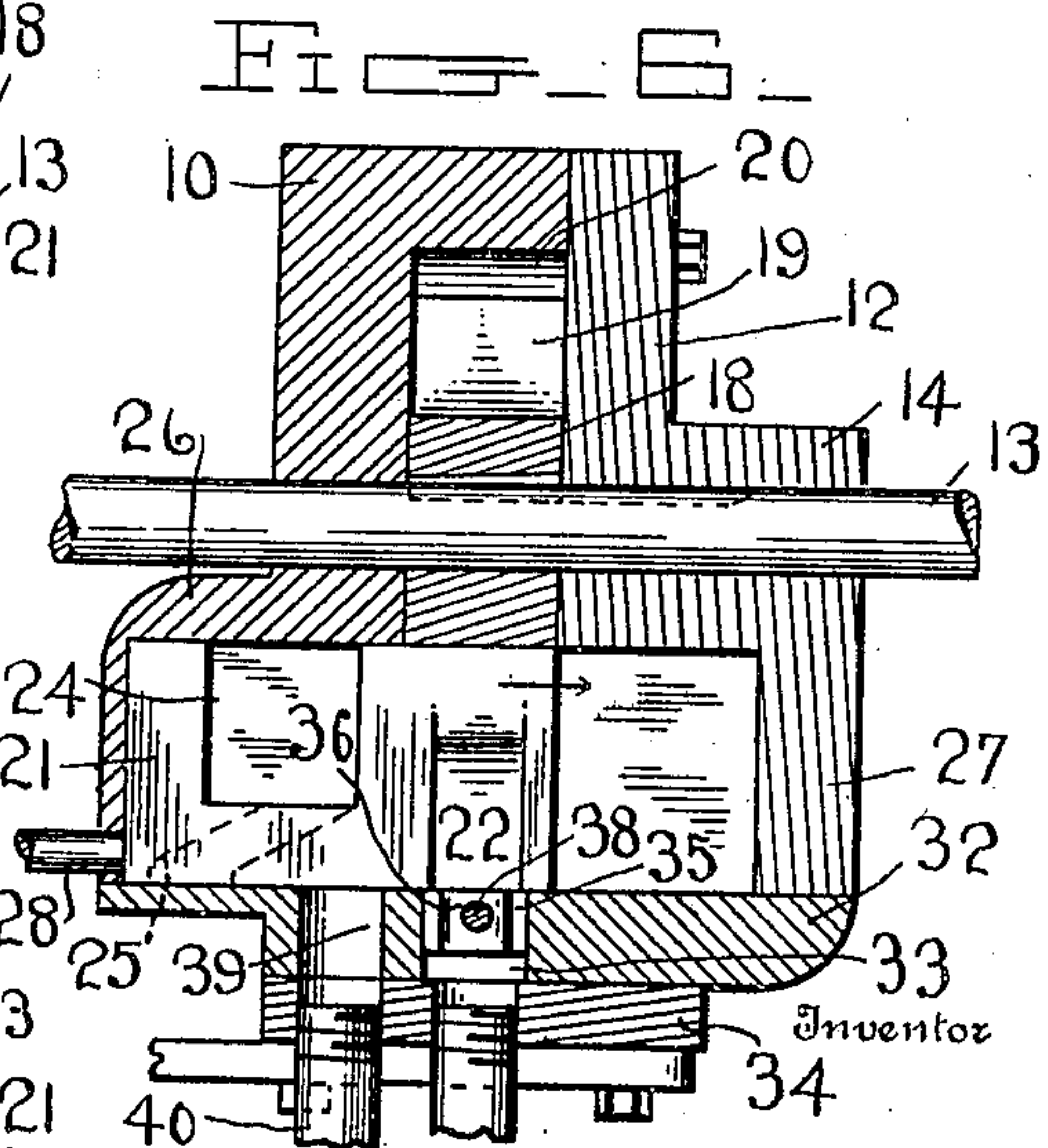
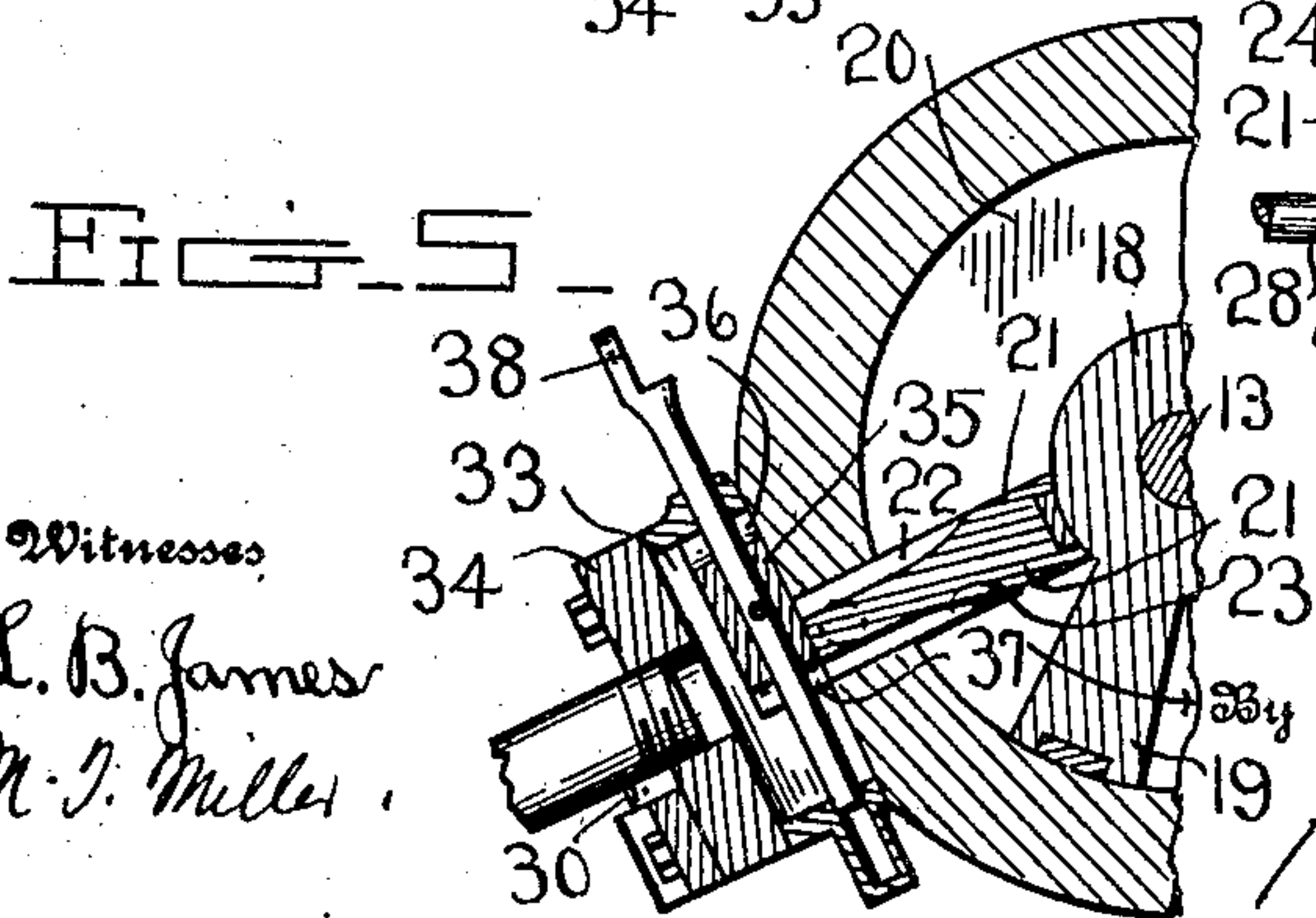
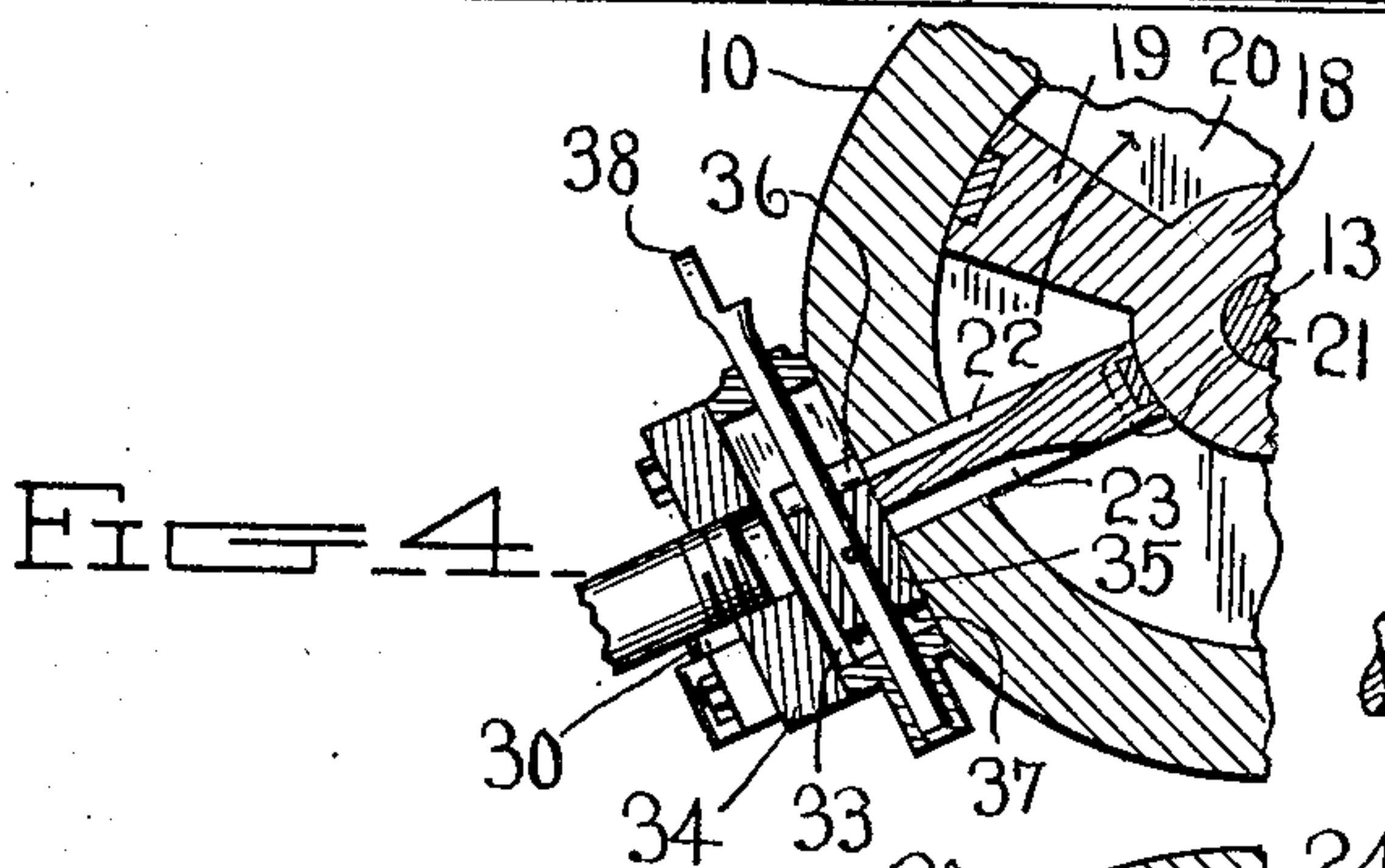
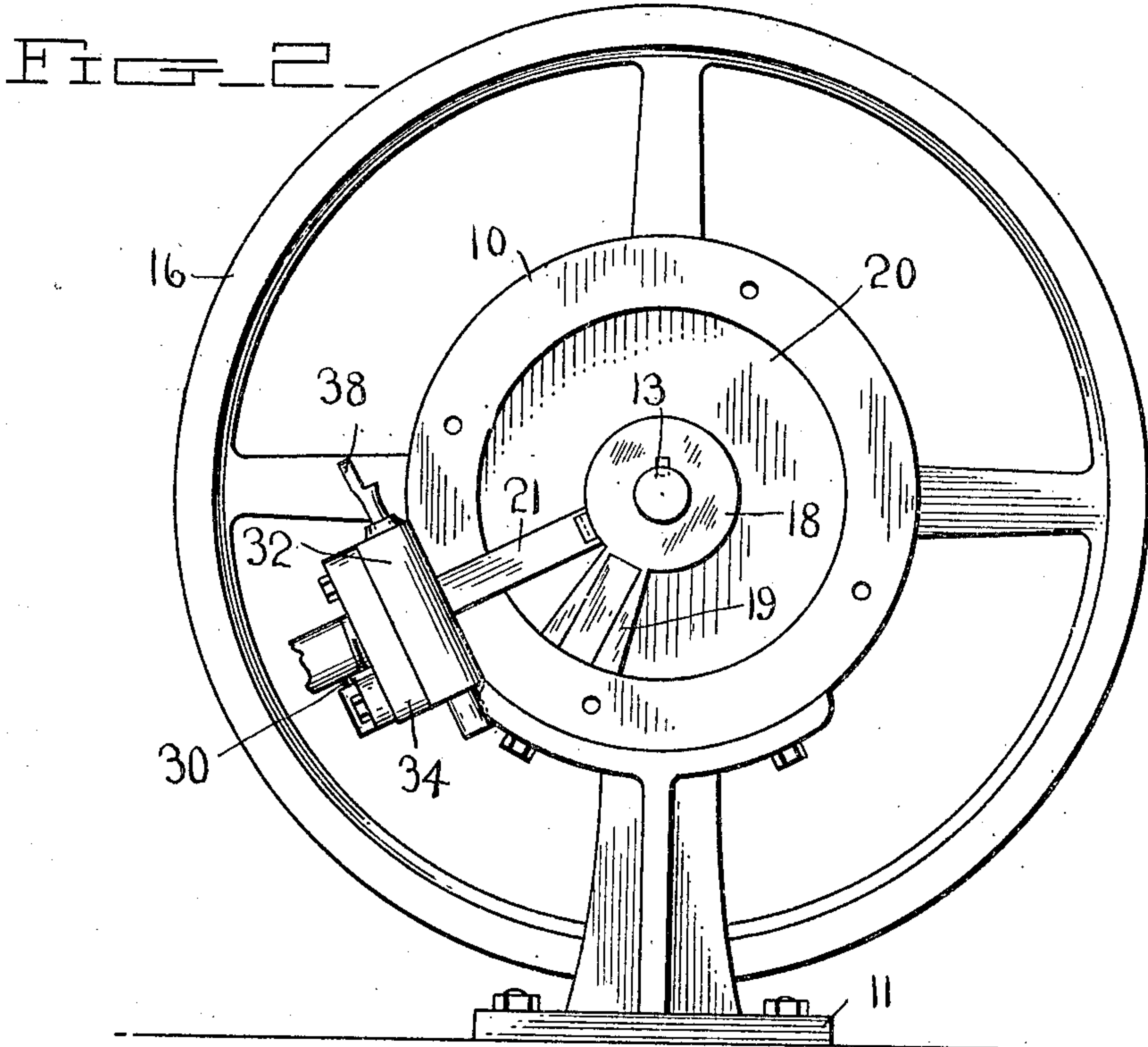
Witnesses
 L. B. James
 M. J. Miller.

Inventor
 Alonzo Crull
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Attorneys

UNITED STATES PATENT OFFICE.

ALONZO CRULL, OF ANDREWS, INDIANA.

ROTARY ENGINE.

No. 919,698.

Specification of Letters Patent.

Patented April 27, 1909.

Application filed September 28, 1908. Serial No. 454,958.

To all whom it may concern:

Be it known that I, ALONZO CRULL, a citizen of the United States, residing at Andrews, in the county of Huntington, State of Indiana, have invented certain new and useful Improvements in Rotary Engines; and I do hereby 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.

This invention relates to that type of rotary engines characterized by a rotary piston working in an annular steam chamber, and a sliding abutment extending across the chamber, and adapted to be periodically withdrawn to permit the piston to pass.

The object of the present invention is to provide an engine of this kind which is simple in structure, its parts being few and uncomplicated, in order that the engine may be run without being liable to mishaps.

The invention also has for its object to provide improved means for operating the abutment, as well as the valve controlling the inlet and exhaust of steam, together with other novel features of construction to be hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of the engine. Fig. 2 is an end view with the face plate of the cylinder removed. Fig. 3 is a plan view of the valve chest with the cover removed. Fig. 4 is a section on the line 4—4 of Fig. 3. Fig. 5 is a similar view showing the parts in another position. Fig. 6 is a section on the line 6—6 of Fig. 3. Fig. 7 is a perspective view of the abutment.

Referring specifically to the drawings, 10 denotes a cylinder which is mounted on a suitable base 11, and has a circular chamber closed by a face plate 12. A horizontal shaft 13 extends loosely through the cylinder concentric therewith, and is supported at one end in a bearing 14 formed on the face plate, and at the other end said shaft is supported by a bearing standard 15. On the shaft is a fly wheel 16, and a cam disk 17, the latter being for a purpose to be presently described.

Fastened to that portion of the shaft within the circular chamber of the cylinder, is a rotary piston comprising a hub 18, and a wing 19 radiating therefrom. The end and sides of the wing are in sliding contact with the walls of the cylinder, and are provided with a suitable packing as shown. By the

hub 18 an annular steam space 20 is formed in the chamber of the cylinder in which space the wing travels.

Across the steam space works an abutment 21 which is periodically withdrawn to let the wing 19 pass. This abutment is a plate having adjacent one of its ends grooves 22 and 23 respectively on opposite sides. Near the other end of the plate a recess 24 is made in one edge of the plate which recess corresponds in width to the width of the steam space 20. From the inner edge of the recess a groove 25 extends obliquely to the other edge of the plate, said groove being made in the face of the plate. The movement of the abutment is parallel to the axis of the shaft 13, and it works in a slot made in the wall of the cylinder 10. The cylinder is also formed with an enlargement 26, and the face plate is also formed with an enlargement 27. In these enlargements are recesses in which the abutment also works. One end of the abutment is fitted with a stem 28 which extends through the wall of the enlargement 26 to the outside thereof, and is connected to a block 29 slidably mounted in a guide 30. The block has a recess 31 in which the edge of the cam disk 17 works, whereby the abutment is reciprocated.

The steam chest of the engine is composed of a plate 32 bolted or otherwise secured to the cylinder 10, and having an opening 33 which is so located with respect to the abutment that the latter slides back and forth in front of the same. The opening is covered by a plate 34 through which a steam supply pipe extends to said opening. In the opening works a slide valve for stopping or reversing the engine. The valve is a block fitting snugly between the side walls of the opening and having in its ends grooves 36 and 37 respectively. To the valve is connected a stem 38 for manually operating the same.

The plate 32 also has an opening 39 which is the exhaust and is adapted to communicate with the groove 25 as will be presently described. An exhaust pipe 40 leads to this opening.

The operation of the engine is as follows:—The direction in which the piston travels depends on the position of the block 35. When it is positioned in the steam chest so that its groove 36 communicates with the groove 22 as shown in Fig. 4, the piston rotates in the direction of the arrow. To reverse the en-

gine the position of the valve is reversed as shown in Fig. 5, the groove 22 being covered and the groove 23 being in communication with the groove 37. To stop the engine the valve is positioned so that it will cover both grooves 22 and 23. The cam disk 17 is so designed that when the wing 19 reaches the abutment, the latter is slid forwardly as indicated by the arrow in Fig. 6, out of the way into the recess of the enlargement 27 to permit the wing to pass through the recess 24. When the abutment is in this position the groove 25 is in communication with the steam space 20 so that the exhaust will take place when the wing passes said groove. Immediately after the wing has passed the abutment, the latter slides back to extend across the steam space and steam again enters behind the wing through the grooves 22 and 36 as before, or through the grooves 23 and 37 if the valve 33 is in the position shown in Fig. 5.

What is claimed, is:—

1. A rotary engine comprising a cylinder having an annular steam space, a rotary piston working in said space, an abutment having inlet and exhaust ports, and a recess to permit the piston to pass, and means for reciprocating said abutment in a plane parallel to the axis of the piston.

2. A rotary engine comprising a cylinder having an annular steam space, a rotary piston working therein, an abutment having inlet ports on opposite sides thereof and an exhaust port, and a recess to permit passage of the piston, the exhaust port communicating with said recess, means for operating the abutment, and a valve controlling the inlet ports.

3. A rotary engine comprising a cylinder having an annular steam space, a rotary piston working in said space, an abutment having inlet and outlet ports and an exhaust port, and a recess to permit passage of the piston, said exhaust port communicating with the recess, a steam chest comprising a plate formed with an opening across one end of which the abutment works, and a valve slidably mounted in said opening, said valve comprising a block having grooves in its ends adapted to register respectively with the grooves of the abutment, and a supply connection to the valve chest.

In testimony whereof, I affix my signature, in presence of two witnesses.

ALONZO CRULL.

Witnesses:

M. WOODBECK,
PH. WILLETS.