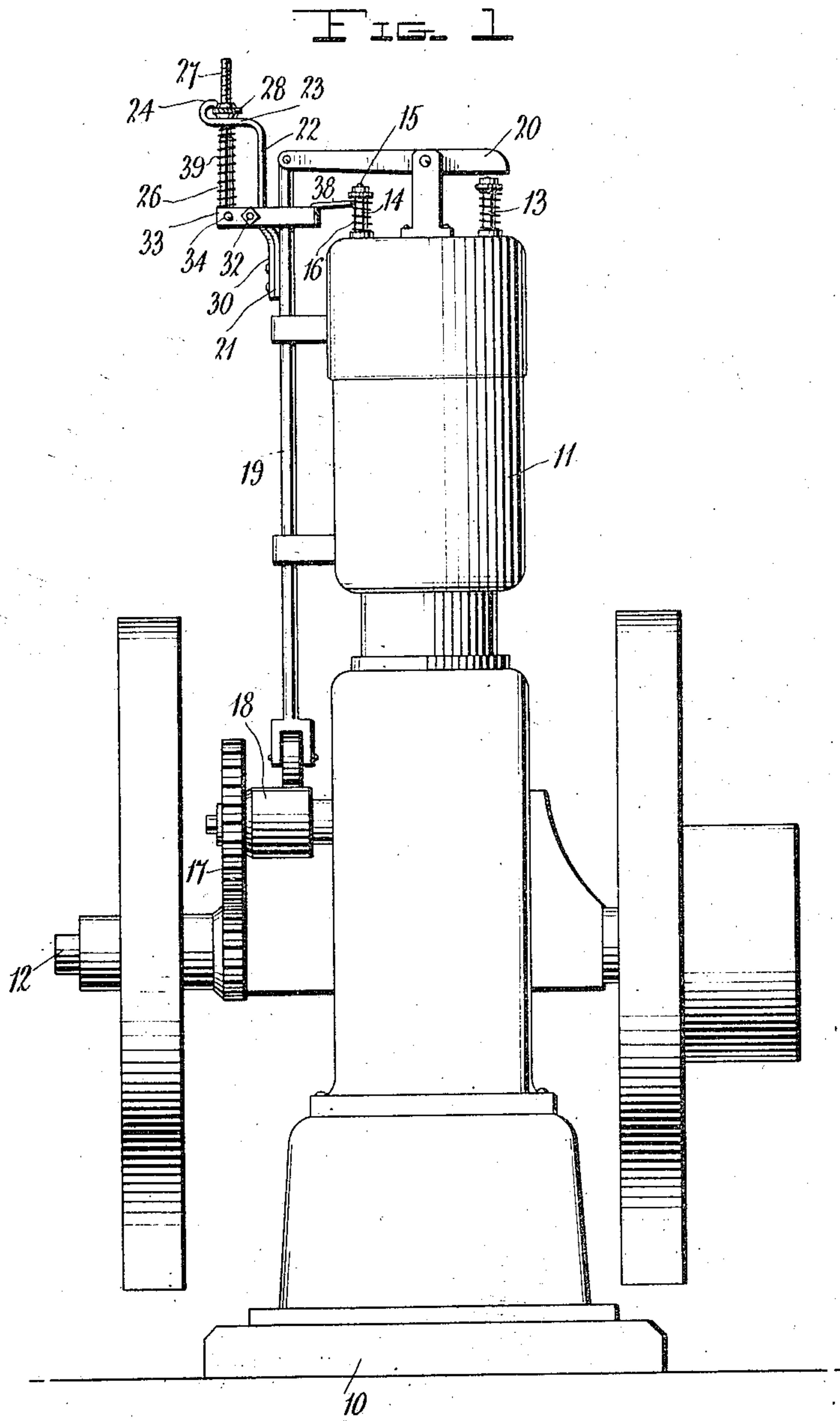


E. J. BALKE.
GASOLENE ENGINE ATTACHMENT.
APPLICATION FILED NOV. 4, 1910.

990,330.

Patented Apr. 25, 1911.

2 SHEETS—SHEET 1.



Witnesses

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2 SHEETS—SHEET 2.

FIG. 2

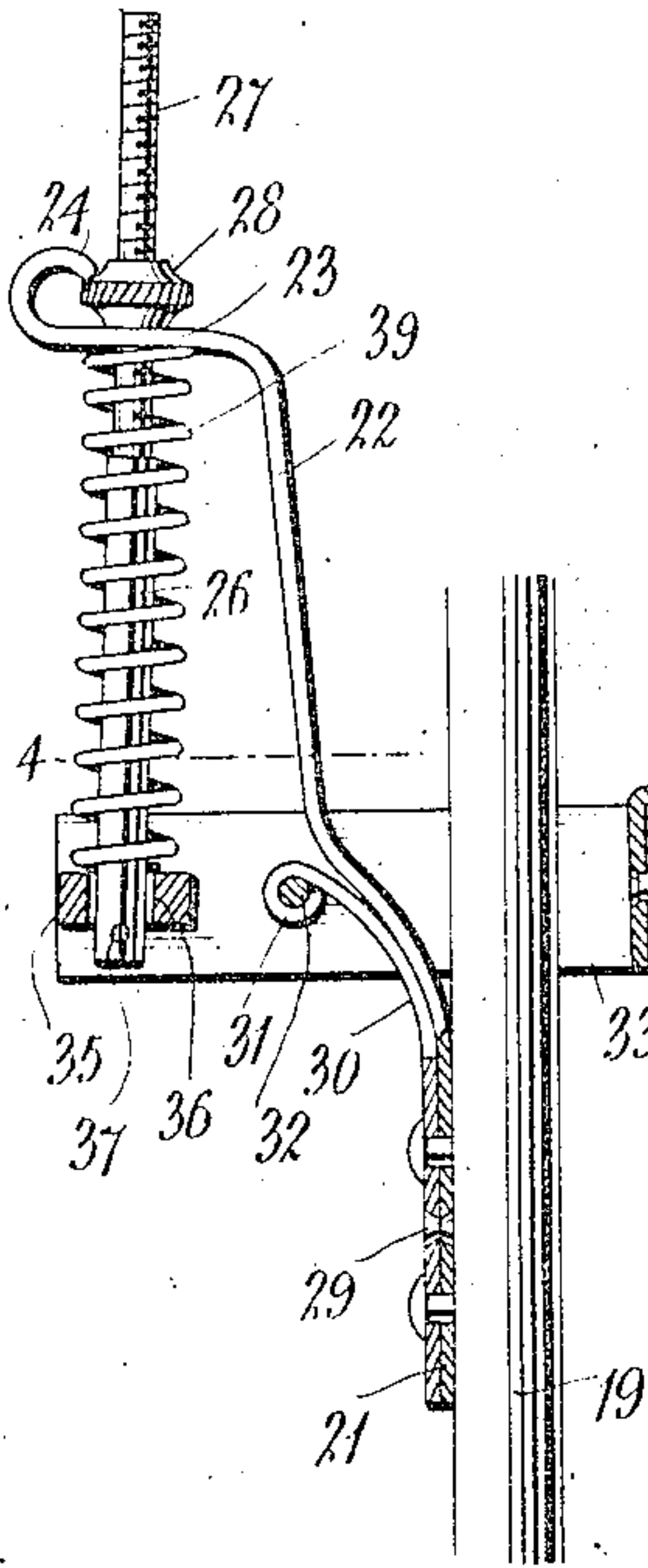


FIG. 3

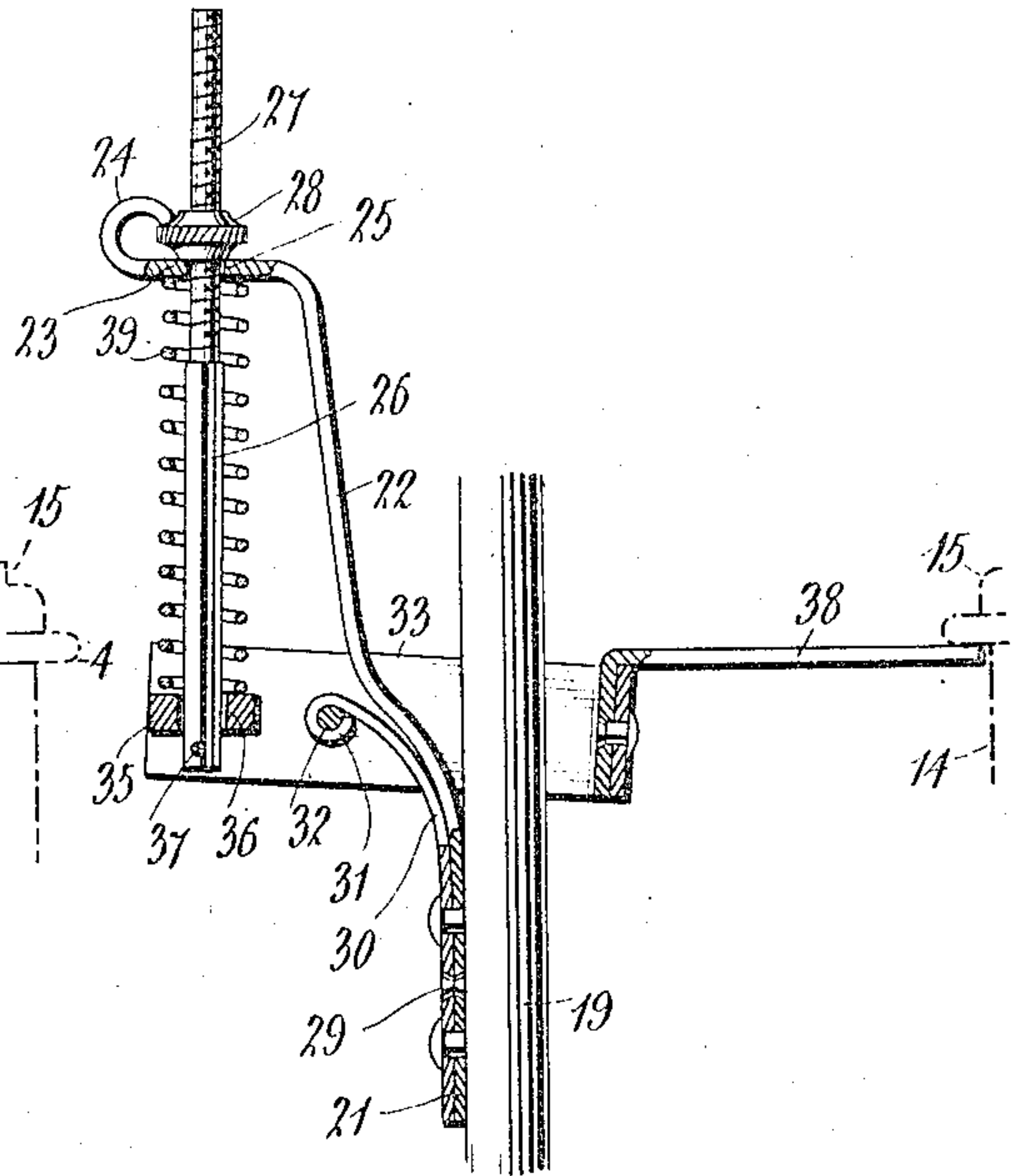


FIG. 4

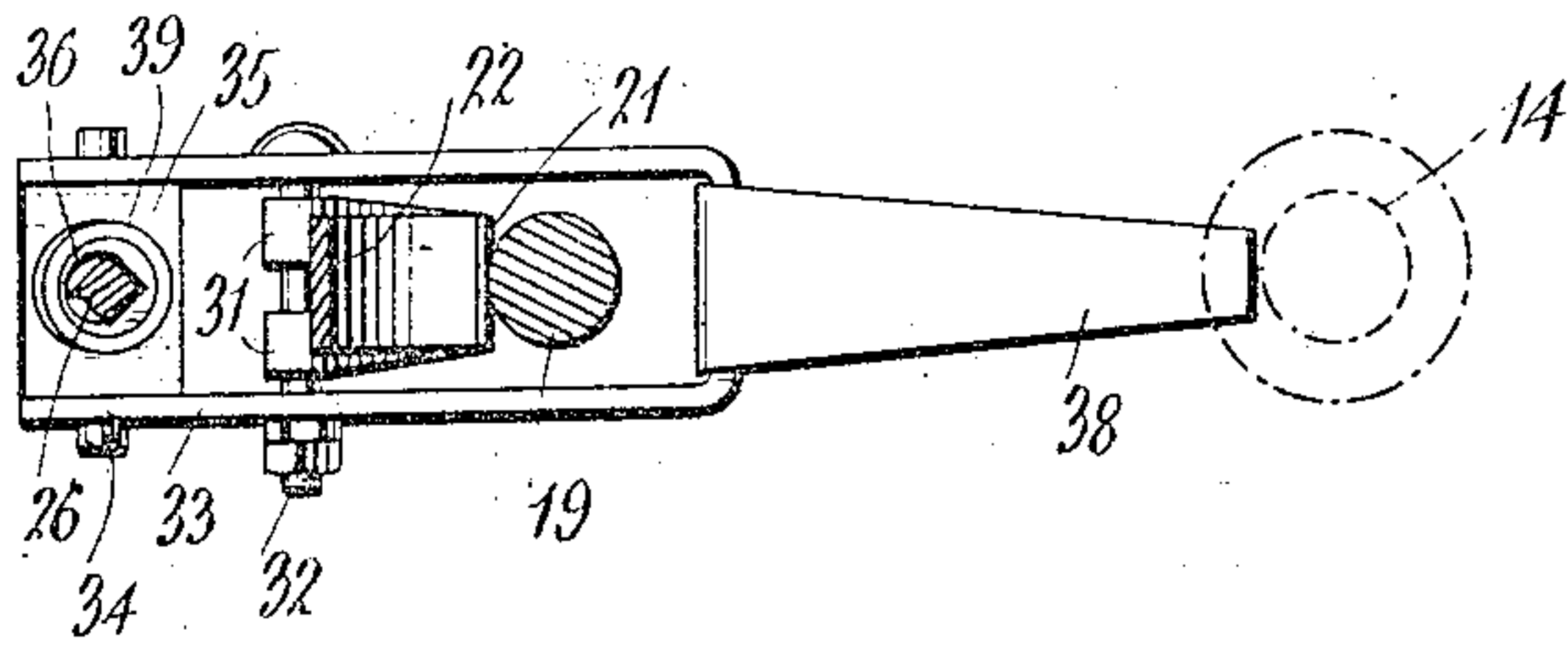
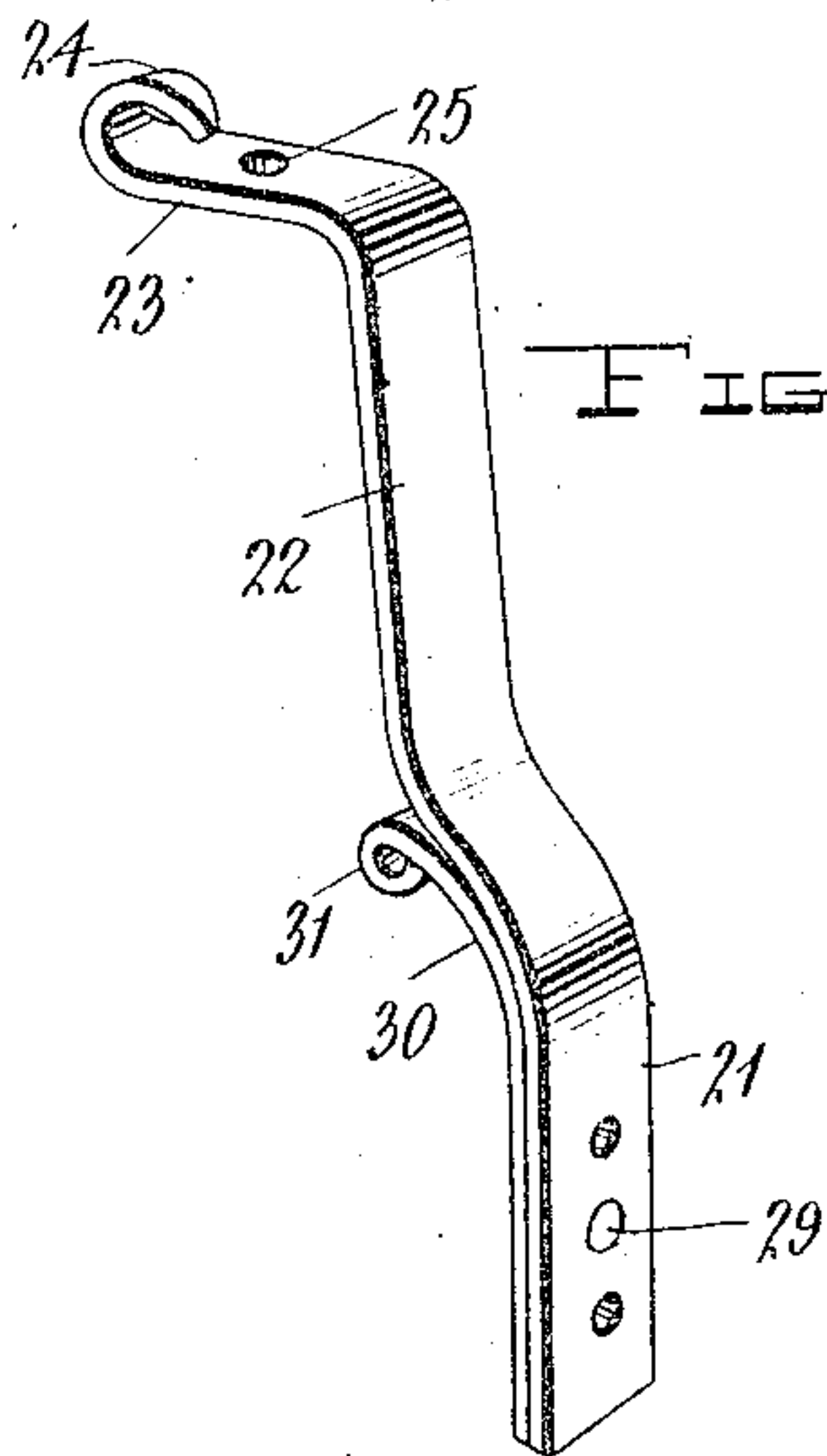


FIG. 5



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UNITED STATES PATENT OFFICE.

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GASOLENE-ENGINE ATTACHMENT.

990,330.

Specification of Letters Patent.

Patented Apr. 25, 1911.

Application filed November 4, 1910. Serial No. 590,732.

To all whom it may concern:

Be it known that I, EDWARD J. BALKE, a citizen of the United States, residing at Pella, in the county of Shawano, State of Wisconsin, have invented certain new and useful Improvements in Gasolene-Engine Attachments; 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 gasolene engines and has special reference to a novel controlling device for the intake valve of such engines.

It is well understood that in many gasolene engines the intake valve is a species of check valve which is operated solely by the pressure on the outer side of the valve being in excess of the pressure within the cylinder during the suction stroke of the engine. It is also common in such engines to provide spring means for normally holding such valves closed. Now it sometimes happens that if this spring means be sufficiently weak to permit the free action of the valve the valve will open slightly just at the end of the exhaust stroke and before the suction stroke begins. This is especially true in engines having crank case compression prior to the introduction of the explosive charge.

The principal object of the present invention is to provide a novel means for reinforcing the action of the retaining spring in such a valve, the means being so arranged that the degree of reinforcement will vary during the operation of the device so that it is greatest at the time when the exhaust valve is opening, this being the time when it is more needed.

With the above and other objects in view the invention consists in general of a novel and improved arrangement adapted to be attached to the valve rod of a gasolene engine and which will reinforce the inlet valve spring during a certain portion of the movement of the engine.

The invention further consists in certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawings, and specifically set forth in the claims.

In the accompanying drawings like characters of reference indicate like parts in the several views, and; Figure 1 is an elevation

of the gasolene engine equipped with this invention, Fig. 2 is an enlarged detail sectional view showing a portion of the inlet valve stem and exhaust valve rod of the engine with the improved device applied thereto, the positions of the parts being those assumed when the exhaust valve is closed, Fig. 3 is a view similar to Fig. 2 with the parts shown in the position taken while the exhaust valve is open, Fig. 4 is a detail section on the line 4-4 of Fig. 2, Fig. 5 is a detail perspective view of a certain spring used in connection with this invention.

In the embodiment of the invention herein shown there is disclosed an engine provided with a base 10, a cylinder 11, a crank shaft 12, an exhaust valve the stem of which is indicated at 13 and an inlet valve having a stem 14 provided with a head 15 and a spring 16 surrounding the stem between the head and the cylinder 11. The engine is also provided with the usual gearing 17 for the actuation of a cam 18 which in turn serves to reciprocate an exhaust valve rod 19, the latter being connected to one end of an exhaust valve lever 20, the opposite end of which is arranged to press down upon and open the exhaust valve at the proper time.

In the present instance the exhaust valve rod 19 is preferably located on the same side of the engine as the inlet valve stem 14. The invention itself embodies an attachment for the valve rod 19. This attachment comprises a bar having a flat portion 21 adapted to be secured to the side of the valve stem 19 and this flat portion extends upward in an offset portion 22 provided at its upper end with an angled portion 23 having an inward turned guard finger 24 at its extremity. This angular portion 23 is provided with an opening 25 through which passes a bar 26 having a threaded upper end 27. On this threaded upper end is screwed a thumb nut 28 which is so arranged that a portion of the nut projects beneath the guard finger 24 so that the thumb nut is held between the portions 23 and 24 of the previously described bar. Secured to the portion 21 of the bar by means of a rivet 29 is a spring plate 30 having a forked extremity forming a pair of spaced ears 31 the arms of the fork being bent to a substantially circular form for this purpose. Through these ears 31 extends a pivot pin 32 whereon is journaled a U-shaped member 33. The legs of this

member are perforated adjacent their extremities for the purpose of receiving the journals 34 of a block 35 which is provided with an opening 36 through which passes the lower end of the rod 26, the same being prevented from upward movement through the opening by means of a pin 37 extending transversely through the lower end of the member 26. Secured to the bight of the U-shaped member 33 is a finger 38 and this finger is of such length and so positioned as to normally extend beneath the head 15 of the inlet valve stem. Surrounding the member 26 is a coil spring 39. Now it will be observed that by means of the nut 28 the tension of this coil spring may be adjusted and it will also be observed that by provision of the spring 30 the pivot pin 32 can move under certain conditions to and from the valve rod 19.

In the operation of the device the inlet valve is so adjusted that the tension of the spring 16 is sufficiently light to permit the free opening of said valve during the suction stroke of the engine. The tension of the spring 39 is also adjusted so that when the valve rod 19 is in its lowest position, as will be the case during the suction stroke of the engine, the opening of the inlet valve is permitted to the required extent, it being understood that the regulation of the amount of gasoline mixture admitted can be accomplished by the proper adjustment of said spring 39 since the greater the tension on the spring the less opening will there be to the valve. When the valve rod 19 is reciprocated in order to open the exhaust valve it will be seen that this will carry up with it the attachment and that the finger 38 engaging beneath the head 15 will push upward on the valve and that the upward push will increase during the upward movement of the rod 19 by reason of the tilting movement of the U-shaped member 33 about the pin 32, this movement effecting the compression of the spring 39. At the same time the spring 30 will permit the pin to move slightly outward so that there will be no tendency for the finger 38 to push laterally on the valve stem 16, while at the same time this finger may be so adjusted as to maintain the proper contact beneath the head at all times. It will be further noted that by the adjustment of the spring 39 by means of the nut 28 the angle between the valve rod and the member 33 may be varied so that the finger 38 will be engaged with the head 15 for different periods of time during

the reciprocation of the valve rod. In this manner the time of opening of the inlet valve may be regulated.

There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

It will be obvious that minor changes may be made in the form and construction of this invention without departing from the material principles thereof. It is not therefore desired to confine the invention to the exact form herein shown and described but it is wished to include all such as properly come within the scope of the appended claims.

What is claimed is:—

1. In a gasoline engine, the combination with a valve gear including an inlet valve having a stem, a reciprocating valve rod, and means to actuate the rod; of a pivot yieldingly mounted on said rod to move laterally to and from the rod, a member journaled on the pivot and having a finger engaging said valve stem, and means to yieldingly hold said member from movement about the pivot.

2. In a gasoline engine, the combination with a valve gear including an inlet valve having a stem provided with a head, a reciprocating valve rod, and means to actuate the rod; of a pivot carried by said rod, a member journaled on the pivot and having a finger contacting with the under side of the valve stem head during a portion of the reciprocation of the rod, means to yieldingly hold said member from movement about the pivot, and adjusting means to vary the angle between said member and the valve rod.

3. An attachment for gasoline engines comprising a bar adapted for attachment to a valve rod, a pivot carried by the bar, a lever journaled on the pivot and having an end adapted to engage beneath a valve stem head, an out-turned end on said bar, a threaded rod extending through said out-turned end, a nut on said rod above said end, a block carried by said lever and provided with an opening through which said rod passes, a stop on said rod below said block, and a spring surrounding the rod between the block and out-turned end.

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

EDWARD J. BALKE.

Witnesses:

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WM. BLUM.