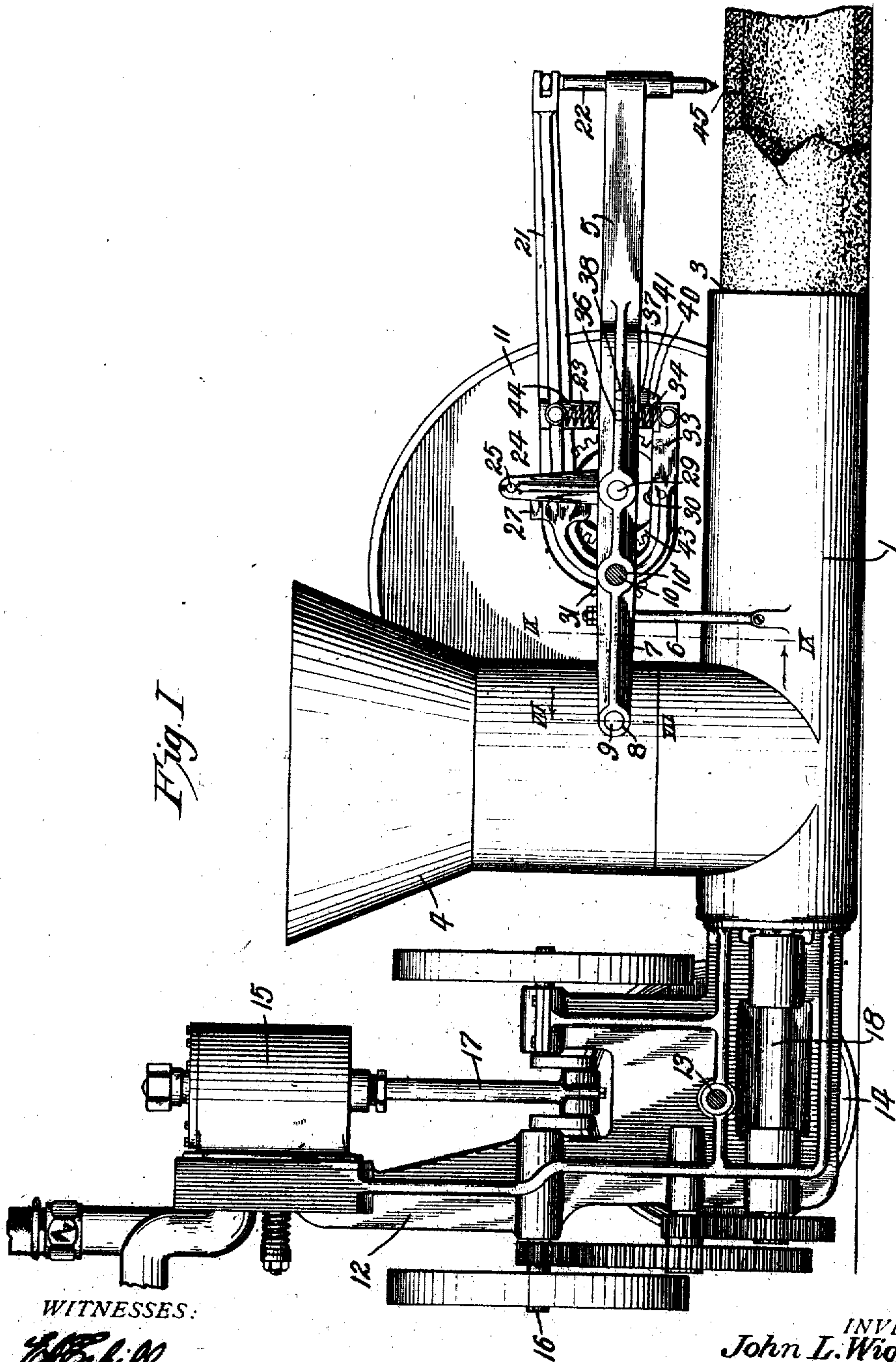


952,489.

J. L. WIGGINS.
MACHINE FOR FORMING CONTINUOUS PIPE.
APPLICATION FILED MAY 6, 1909.

Patented Mar. 22, 1910.

6 SHEETS—SHEET 1.



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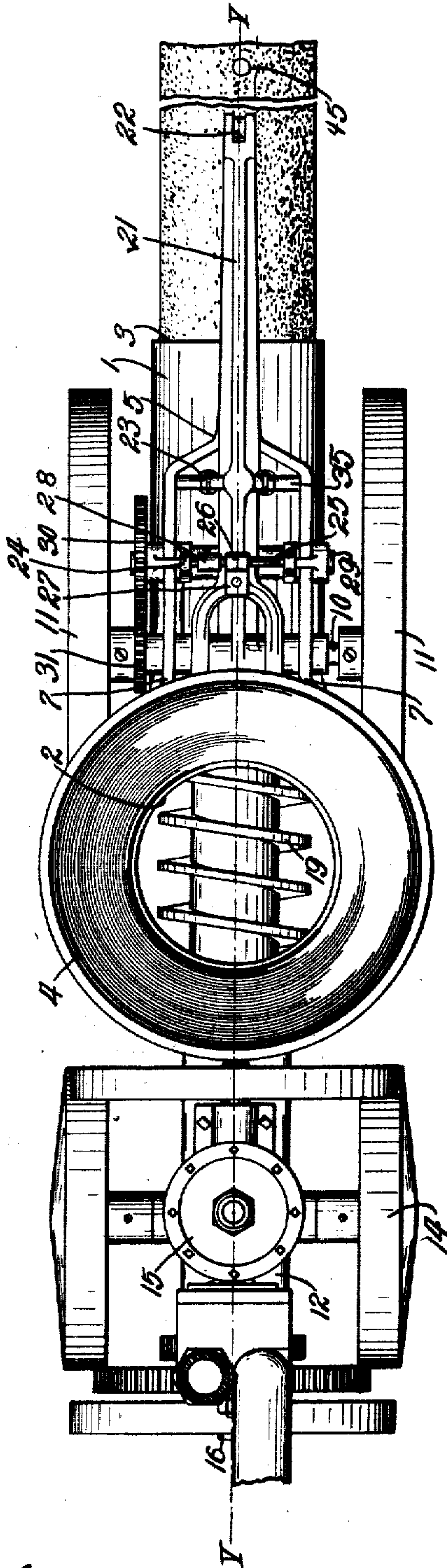
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6 SHEETS—SHEET 2.

Fig II.



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5 SHEETS—SHEET 3.

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Fig. IV

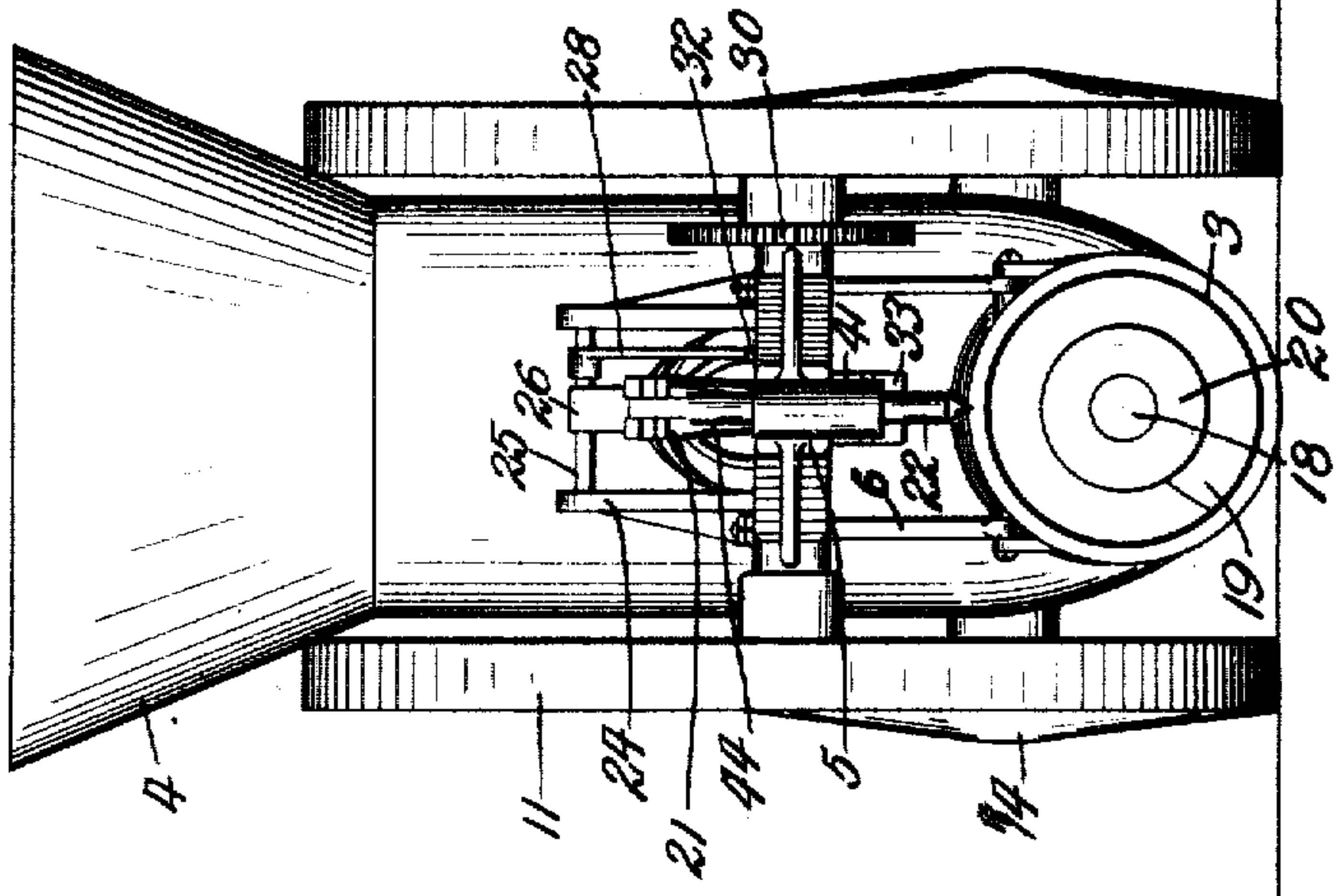
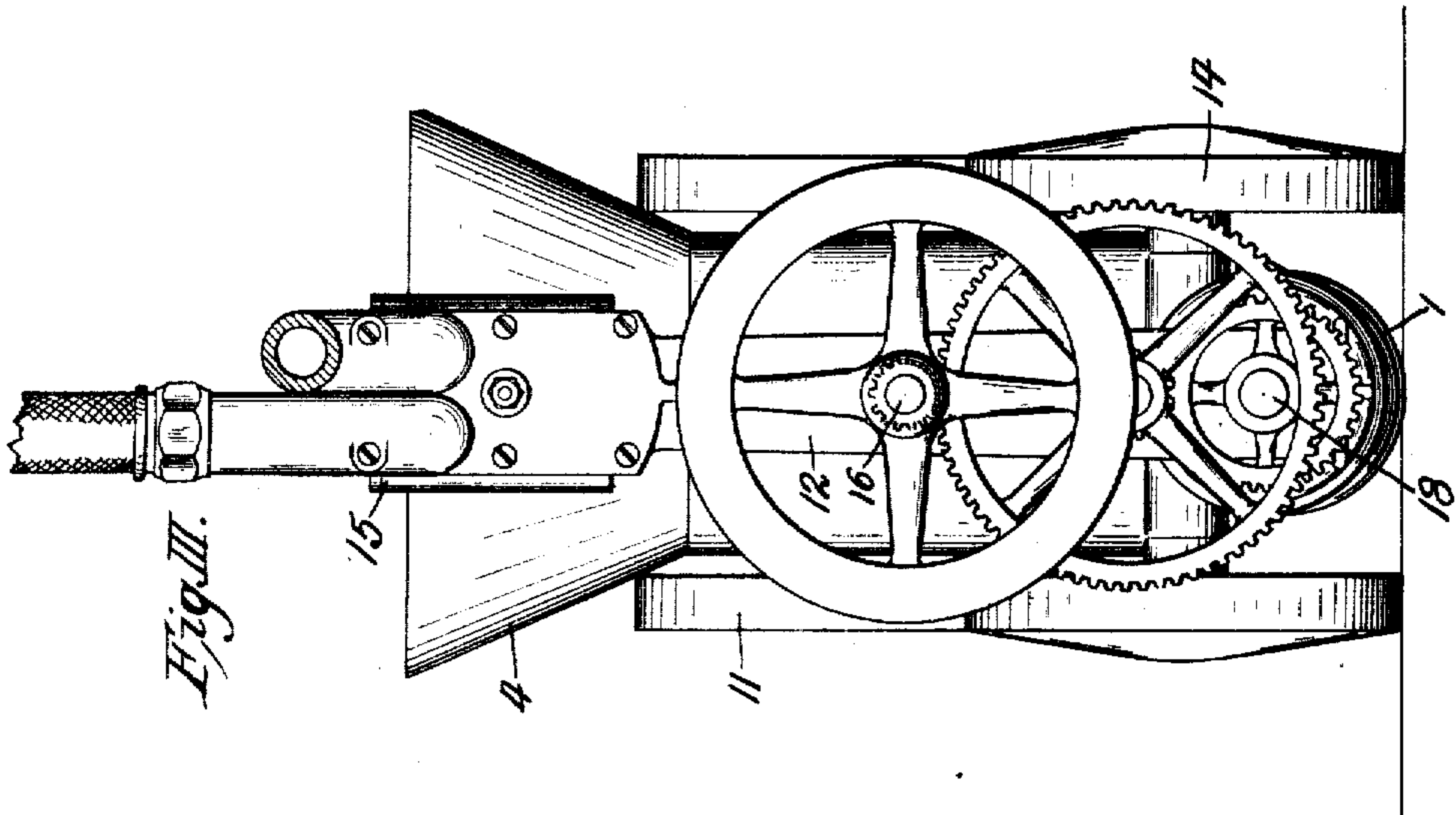


Fig. III



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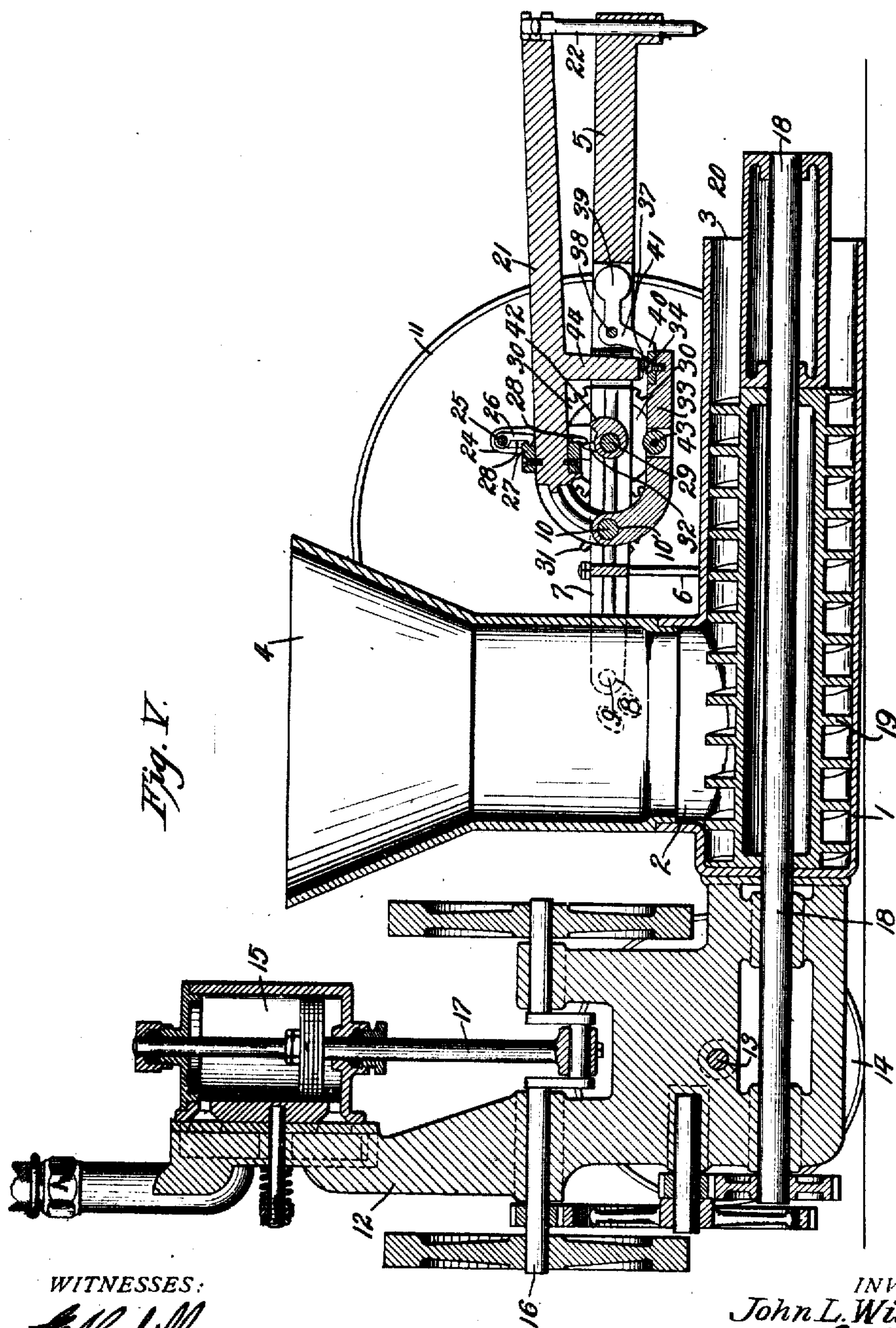
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5 SHEETS—SHEET 5.

Fig. VI.

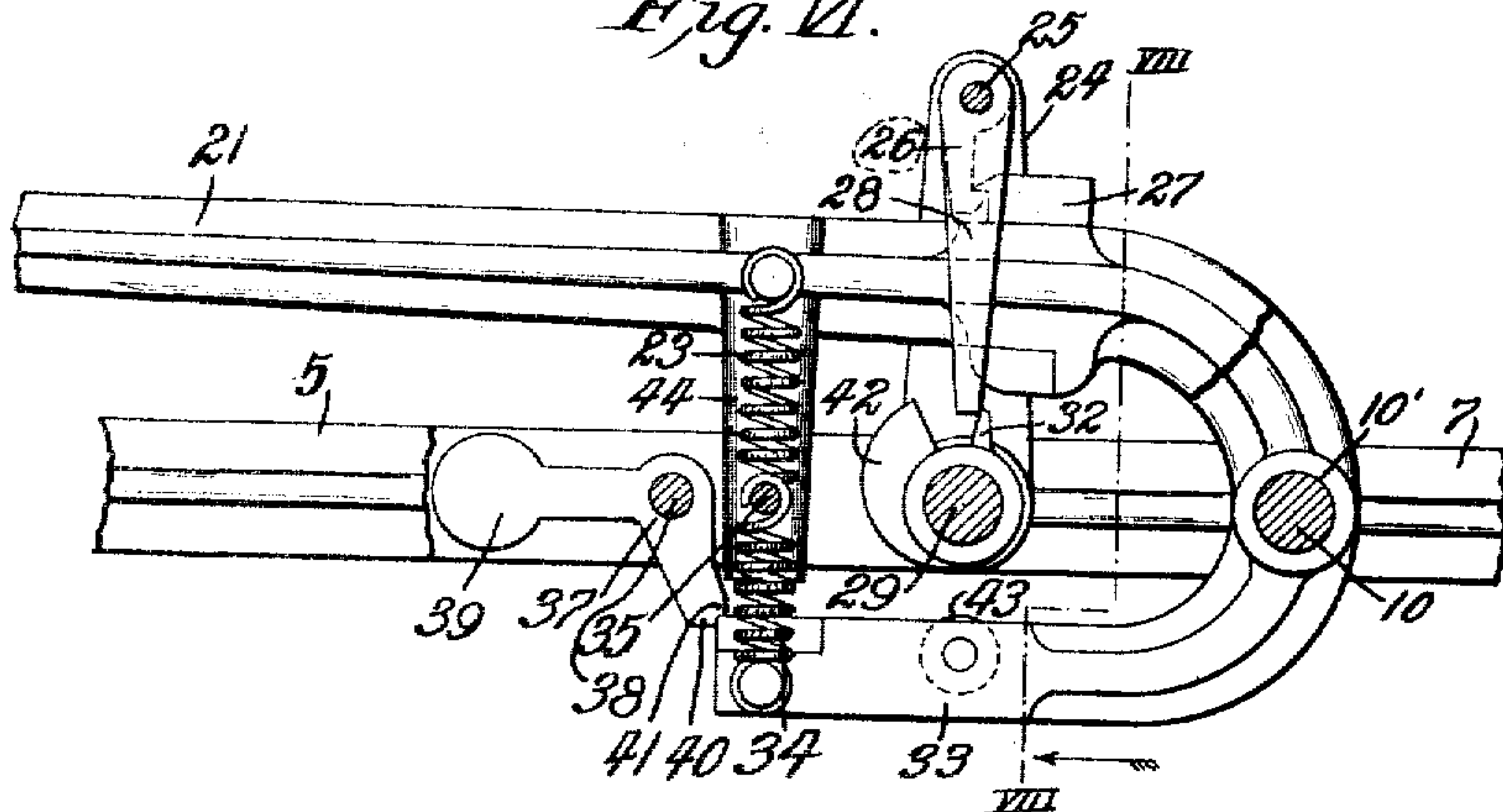


Fig. VII.

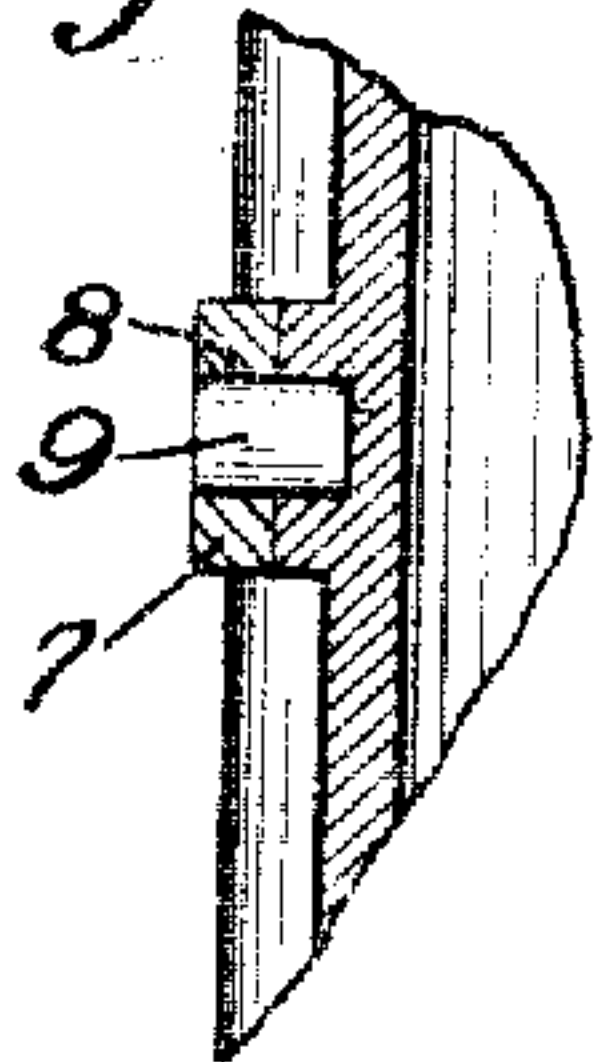


Fig. VIII.

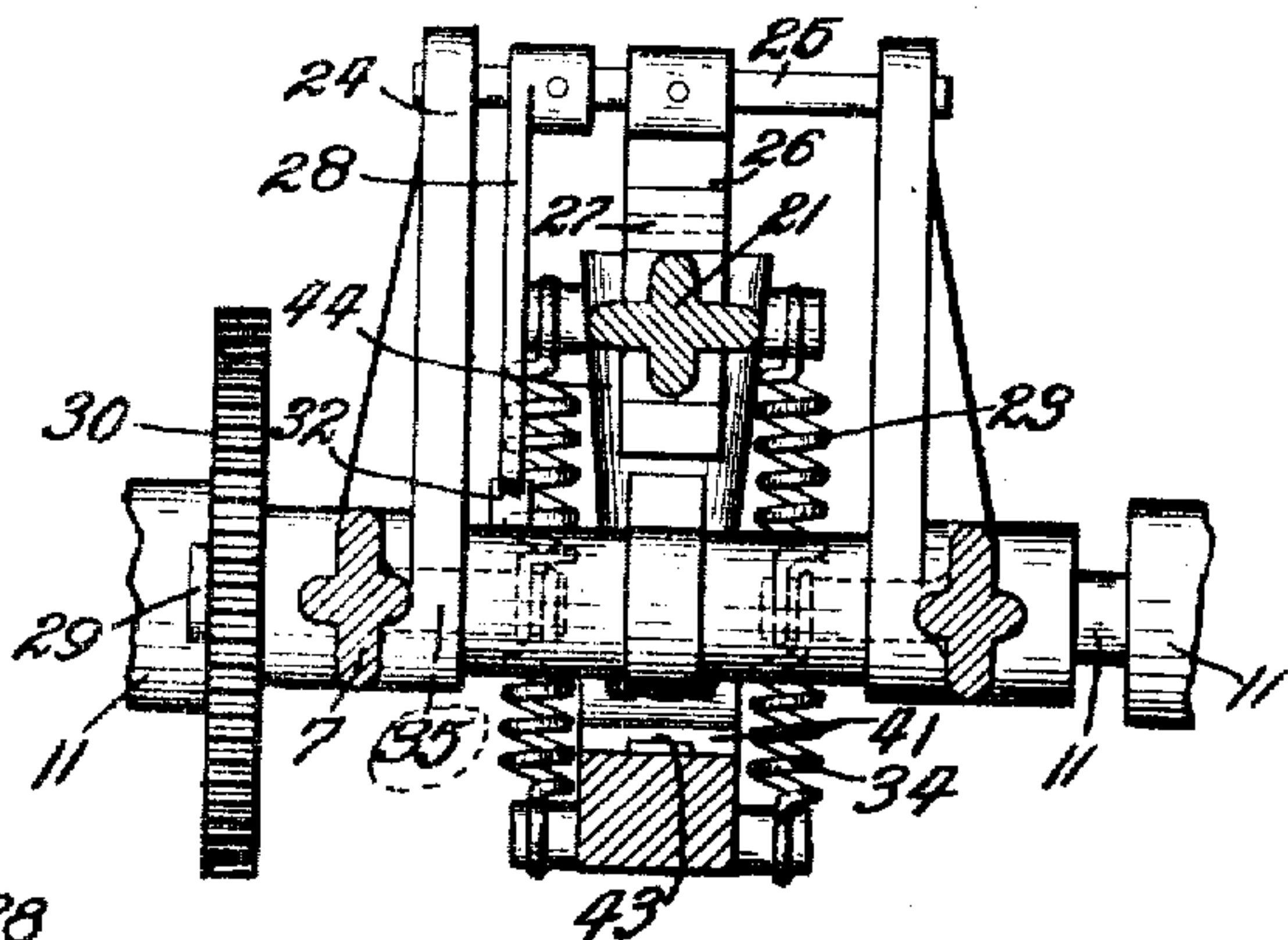
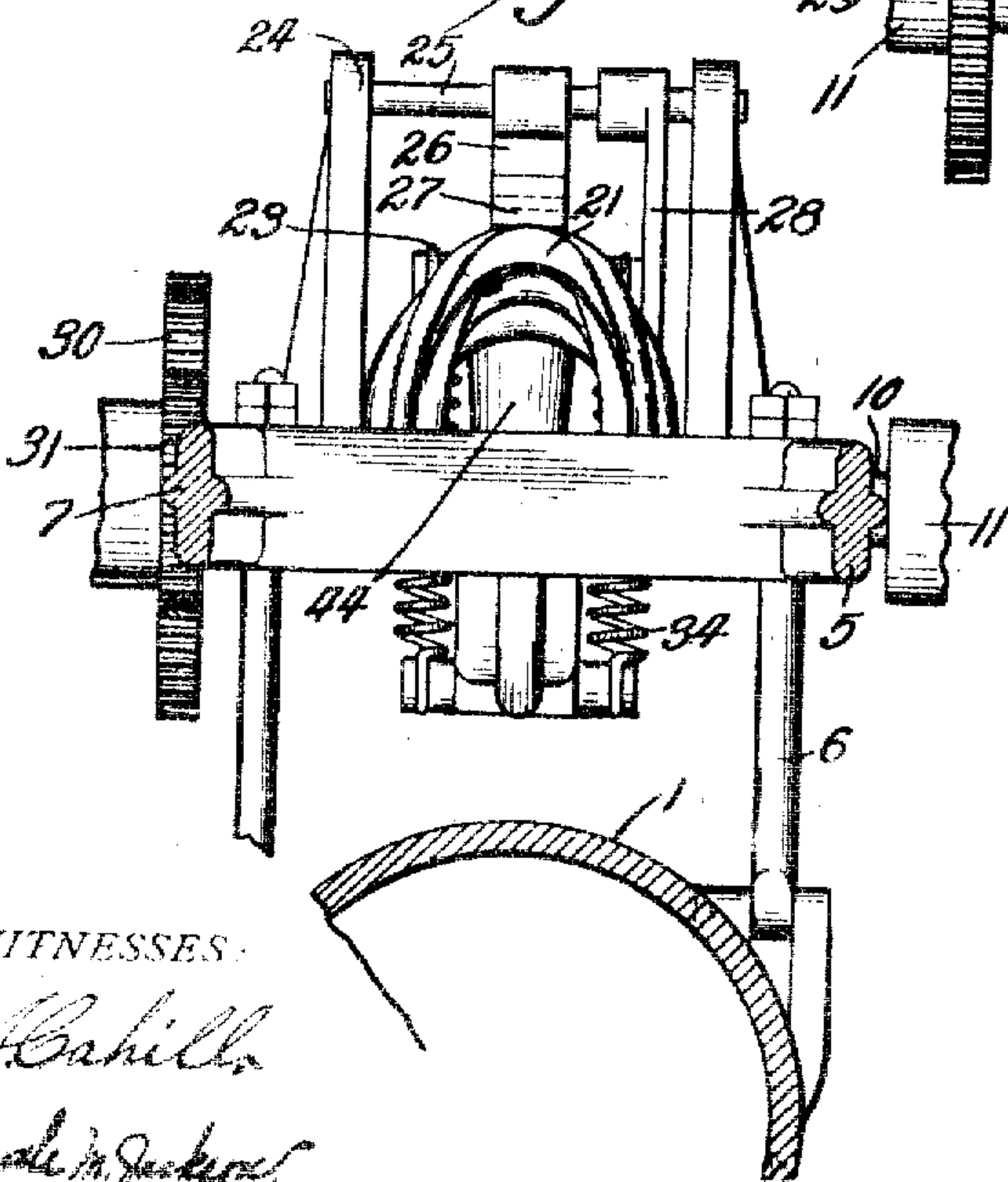


Fig. IX.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR FORMING CONTINUOUS PIPE.

952,489.

Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed May 6, 1909. Serial No. 494,503.

To all whom it may concern:

Be it known that I, JOHN L. WIGGINS, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Machines for Forming Continuous Pipe; 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to a machine for forming continuous pipe and has for its object to provide a device of that character which is self contained and propelling, and which comprises parts for perforating the pipe at regular intervals, during the machine travel.

It is a further object of my invention to provide the improved details of structure presently described and pointed out in the claims, reference being had to the accompanying drawings, in which:—

Figure I is a side elevation of a machine constructed according to my invention and showing a portion of formed pipe. Fig. II is a plan view of the machine. Fig. III is an end view of same. Fig. IV is a rear end view of same. Fig. V is a central longitudinal section of same. Fig. VI is an enlarged detail view of the punching lever. Fig. VII is a sectional view on the line VII—VII, Fig. I, showing the anchoring socket for the punch guide bar. Fig. VIII is a sectional view on the line VIII—VIII, Fig. VI, showing the punch lever and its guide and operating parts. Fig. IX is a sectional view on the line IX—IX, Fig. I.

Referring more in detail to the parts;—1 designates the machine cylinder, the forward end of which is closed and the chamber of which extends from a hopper opening 2 to an open rear end 3. Supported on cylinder 1 is a hopper 4 which is rigidly secured to the cylinder body and has a chamber communicating with the cylinder hopper opening.

5 designates a bar which is supported on the cylinder body by standards 6 and has the yoke arms 7 which embrace a portion of

the hopper and are provided with the pin 55 sockets 8 and journal openings 10'.

9 designates pins which are carried by the hopper body and project into the sockets 8 in the yoke arms, and 10, an axle which is journaled in the opening 10' in such arms.

11 designates wheels carried by axle 10 and adapted for supporting the cylinder 1 in such a manner that the forward end of the cylinder will be slightly above the ground, while the rear end of the cylinder 65 rests thereon.

On the forward end of cylinder 1 is an engine frame 12, through the body of which an axle 13 projects. Carried on axle 13 are the wheels 14 which support the engine 70 frame and the forward end of the cylinder so that the frame and the parts carried thereby are at a sufficient height from the ground to obviate contact therewith.

15 designates an engine of a suitable type 75 which is carried by a frame 12 and is adapted to operate the crank shaft 16 through the rod 17. Revolvably mounted in the frame 12 and the forward closed end of the cylinder 1 and extending rearwardly through 80 said cylinder is a shaft 18, the forward end of which is operatively connected with the crank shaft 16 through a system of gear wheels which are constructed and arranged to materially reduce the speed from the 85 crank to the cylinder shaft.

Rigidly mounted on the shaft 18, within the cylinder chamber, is a worm 19, which fits close against the cylinder sides and is adapted to move material, delivered to the 90 cylinder chamber from the hopper, toward the rear open end of the cylinder.

Rigidly mounted on shaft 18 and projected through and beyond the open end of the cylinder 1 is a core 20, around which 95 the material is formed during the construction of the pipe, the worm 19 being terminated within the cylinder some distance from the open end thereof and the core 20 being extended directly from the worm body 100 in order that the pipe may be formed within the cylinder, before delivery therefrom.

21 designates a punching lever which is pivotally mounted on the rear wheel axle 10 and extends backwardly a short distance 105 beyond the termination of the cylinder core 20.

22 designates a punch which has a rocking

mounting on the free end of lever 21 and extends through a channel in the rear end of the guide bar 5.

23 designates a spring which is connected with the guide bar 5 and punch lever 21 and is adapted for tensioning such lever downwardly toward the guide bar and the punch 22 toward the freshly formed pipe, when the machine is in operation.

Supported on the guide bar 5 are the standards 24, in the upper ends of which a cross shaft 25 is revolvably mounted. Fixed to the shaft 25 is a pawl 26, the latch end of which is adapted for holding engagement with a toothed bracket 27, rigidly mounted on the punch lever, so that when such parts are in engagement the lever will be held in elevated position against the tension of the spring 23; also rigidly fixed to and depending from shaft 25 is a trip arm 28.

Revolvably mounted in the guide bar 5 is a shaft 29. Rigidly mounted on shaft 29 is a gear wheel 30 which meshes with a gear wheel 31, on the rear wheel axle 10, so that the shaft 29 is revolved upon the revolution of said axle.

Fixed on shaft 29 is a dog 32 which is adapted to engage a trip arm 28 and rock the shaft 25 to release the punch lever to the action of its spring 23, so that the punch 22 may be moved into contact with the formed pipe and form an aperture therein. Also revolvably mounted on the rear wheel axle 10 is an arm 33 which projects rearwardly beneath the punch lever and is connected with the guide bar 5 by a spring 34 of substantially twice the strength of the spring 23 connecting the guide bar with the punch lever, each of said springs being preferably mounted at one end on a pin 35 which extends through a slot 36 in the guide bar.

37 designates a bell crank lever which is pivoted at 38, in the bar slot, and has a weight arm 39 which tensions a catch arm 40 toward the free end of the arm 33, the catch arm being provided with a lug 41 which is adapted to engage the free end of the arm 33 and hold same against the tension of the spring 34.

42 designates a cam which is rigidly mounted on the shaft 29 and is adapted for engagement with a roller 43, on the arm 33, so that when the shaft 29 is revolved the arm may be moved downwardly against the tension of spring 34 to such position that its free end may be engaged and held by the bell crank lever 37.

44 designates a post on the punch lever 21 which depends into position for engagement with the catch arm of the bell crank lever 37, so that when the lever is moved downwardly by its spring, the lever 37 will be rocked to release the arm 33.

When the machine is in use, material is

delivered to the cylinder 1 through the hopper and engaged by the worm 19, the material being forced back into the forming section of the cylinder under pressure. The pressure on the material forms same into a compact mass around the core 20, so that the material is forced from the open end of the cylinder in a hollow pipe form, the pipe being delivered onto the ground immediately upon its release from the cylinder in the proper position for irrigating or like purposes. After a portion of the pipe has been laid, in the manner described, a continued operation of the worm will force material against the previously formed pipe and cause a forward travel of the machine, thereby obviating the necessity for an independent driving gear and insuring a proper machine travel relative to the pipe formation.

In order that the pipe may be used for irrigating purposes, means must be provided for the escape of water at regular intervals, and for that purpose I have provided the punching apparatus, illustrated and described. During the forward travel of the machine the gears 30 and 31 cause a revolution of the shaft 29, upon which the trip dog 32 and cam 42 are mounted, the dog being adapted to rock the trip arm 28 and move the pawl 26 out of engagement with the bracket on the lever arm, so that such arm may be moved downwardly by the tension of the spring 23. Immediately upon the release of the lever arm the spring draws same downwardly and forces the punch 22 into and through the freshly formed pipe body, producing the aperture 45 therein. During the downward travel of the lever arm the post 44 engages the trip arm of the bell crank lever 37 and moves same out of engagement with the lever arm 33, so that such arm is released to the tension of the spring 34. Spring 34 being of greater strength than the spring on the lever arm, will, when the arm 33 is released, move same upwardly against the post 44 and raise said post and the lever arm 21 until the punch 22 has cleared the pipe. After the elevation of the lever arm, the cam 42 is moved into contact with the roller on the arm 33 and forces said arm downwardly against the tension of its spring until it has assumed its original position, when the trip arm on the bell crank lever will be rocked over the upper end of the arm and hold same for a succeeding operation.

With a compact arrangement of the cylinder and engine parts the width of the machine may be so limited that it may travel in the trench, within which the pipe is to be laid, and by taking advantage of the propelling tendency of the worm in its feeding action against the previously formed pipe, the use of independent propelling parts may

be obviated and the propelling pressure utilized in securing a compact pipe structure.

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

1. The combination with a pipe forming body and means for feeding material through said body, of a punching mechanism comprising a pivotally mounted arm, a spring for yieldingly tensioning said arm toward said pipe forming body, a trigger adapted for holding said arm against the tension of said spring, means for raising said arm to its trigger engaging position, a trip device adapted for working said trigger, and a punch carried by said arm.

2. The combination with a pipe forming body and means for feeding material through said body, of running gear, a pivoted punch lever, means for tensioning said lever toward the plane of said pipe forming body, a trigger adapted for holding said lever against the tension of said tensioning means, means, actuated by the running gear, for tripping said trigger, and means for setting said arm.

3. The combination with a pipe forming body, of means for forcing material through said body, running gear, a pivoted punch lever, a punch carried by said lever, a trigger adapted for holding said punch lever in set position, a revoluble shaft, means on said shaft for rocking said trigger, a transmission between said shaft and running gear, and means actuated from the running gear for returning said lever to set position.

4. The combination with a pipe forming body, of means for forcing material through said body, running gear, a punch lever adapted for movement toward and from said pipe forming body, a punch carried by said lever, a spring adapted for tensioning said punch lever toward said body, a trigger shaft, a trigger carried by said trigger shaft and adapted for holding said lever in set position, a trip arm carried by said trigger shaft, a revoluble shaft, having operative connection with the running gear, a dog on said shaft adapted for rocking said trip arm, and means for returning said lever to set position.

5. The combination with a pipe forming body, of means for forcing material through said body, a punch lever adapted for movement toward and from said pipe forming body, means for yieldingly tensioning said lever toward said body, a trigger adapted for holding said lever against the tension of said tensioning means, a lever returning arm adapted for movement toward and from said lever, means for tensioning said arm toward said lever, a trigger adapted for holding said arm against the tension of its tensioning means, and mechanism for tripping the lever holding trigger and returning said arm to set position.

6. The combination of a pipe forming body, means for forcing material through said body, running gear, a punch lever pivotally mounted and adapted for movement toward and from said pipe forming body, a spring adapted for yieldingly tensioning said lever toward said body, a trigger adapted for holding said lever against the tension of said spring, a lever returning arm pivotally mounted and adapted for movement toward and from said lever, a spring for tensioning said arm toward said lever, a trigger adapted for holding said arm against the tension of said spring, a revoluble shaft having operative connection with said running gear, means on said shaft for tripping said lever holding trigger, a cam on said shaft for moving said arm against the tension of its spring, and a post on said lever adapted for engagement with the arm trigger, substantially as set forth.

7. The combination of a pipe forming body having a mold chamber provided with a hopper opening and a discharge port, a shaft extending through said chamber, means for actuating said shaft, a core carried by said shaft, a worm carried by said shaft, running gear supporting said body and comprising ground wheels and an axle, a lever pivoted on said axle and provided with a depending post, a punch carried by said lever, a spring adapted for tensioning said lever and punch toward the plane of said pipe forming body, a guide bar having a channel within which said punch is adapted to travel, standards on said guide bar, a shaft revolubly mounted in said standards, a trigger rigidly mounted on said shaft and adapted for holding said lever against the tension of its spring, a trip arm rigidly mounted on said shaft, a cam shaft revolubly mounted in said guide bar and having operative connection with said running gear, a dog on said shaft adapted for engagement with said trip arm, a lever return arm pivotally mounted on said axle and adapted for engagement with the post on said lever, a spring adapted for tensioning said arm toward said lever, a trigger adapted for holding said arm against the tension of its spring and for automatic projection toward its arm engagement, and a cam on said cam shaft adapted for moving said arm against the tension of its spring, the arm holding trigger being adapted for actuation by the lever post during the travel of said lever under its spring tension, substantially as and for the purpose set forth.

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

JOHN L. WIGGINS.

Witnesses:

MYRTLE M. JACKSON,
ARTHUR C. BROWN.