

No. 630,589.

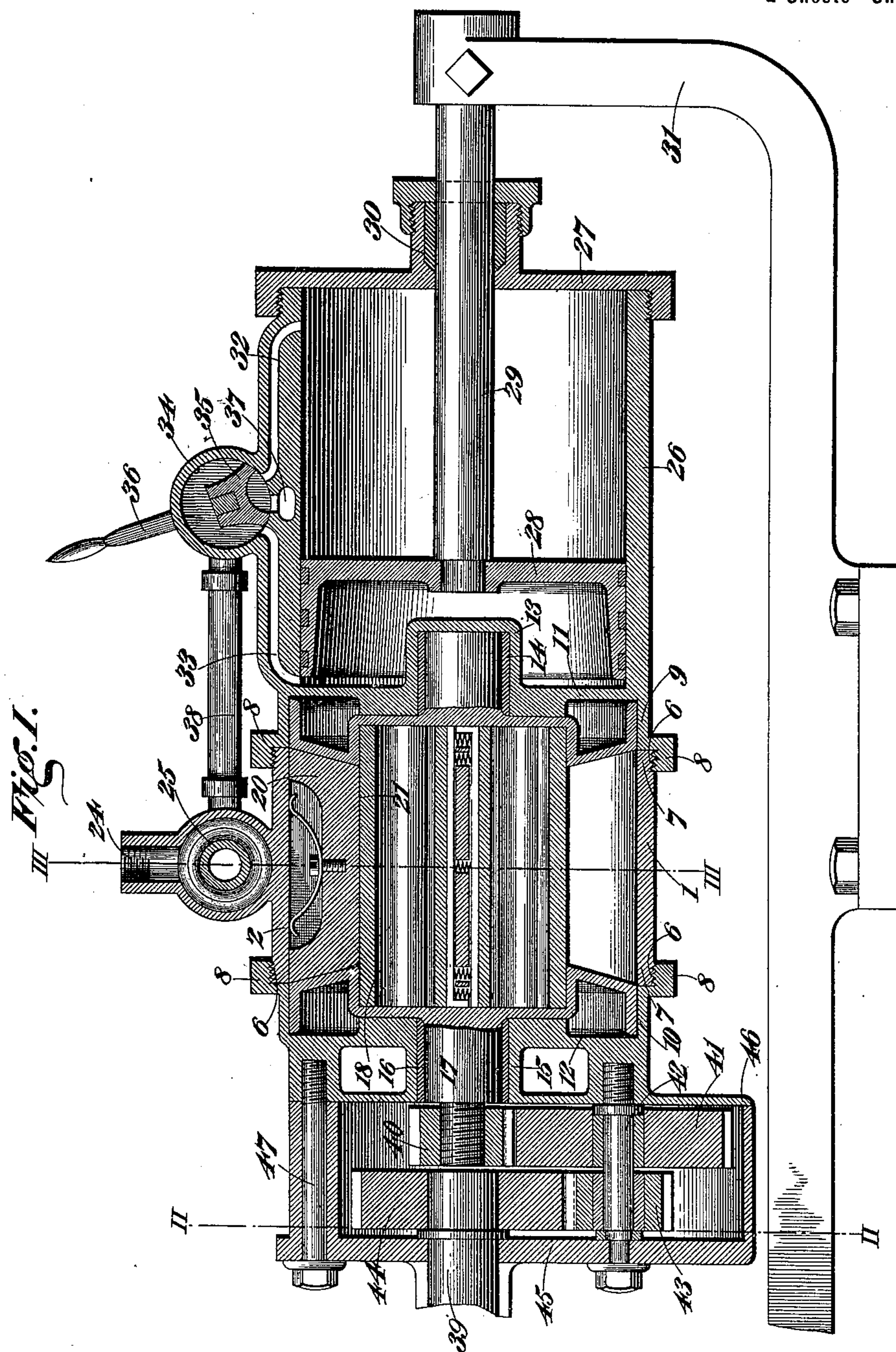
Patented Aug. 8, 1899.

F. H. CATHCART.  
POWER DRIVEN TOOL.

(Application filed July 8, 1897. Renewed July 3, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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Attorney.



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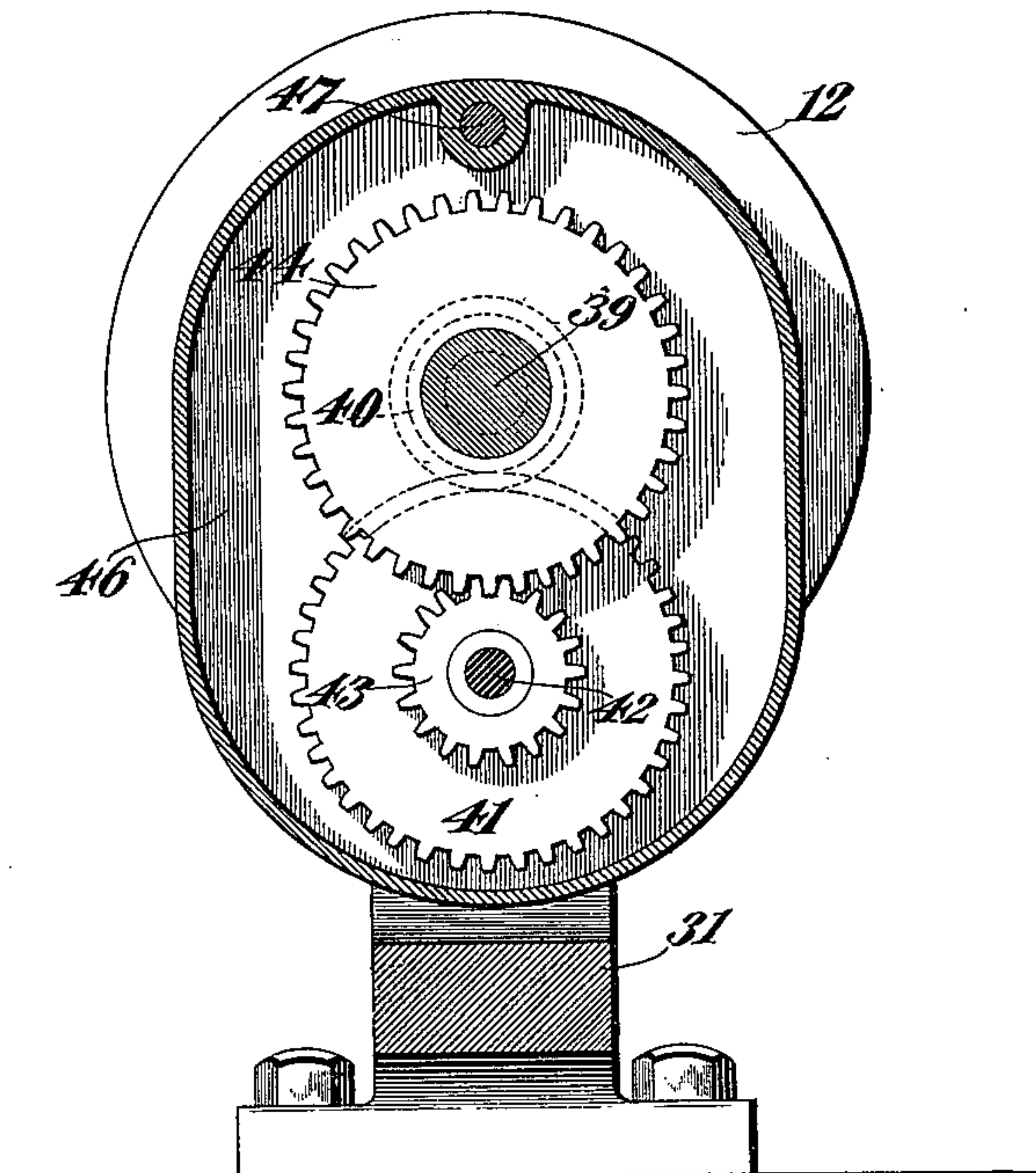
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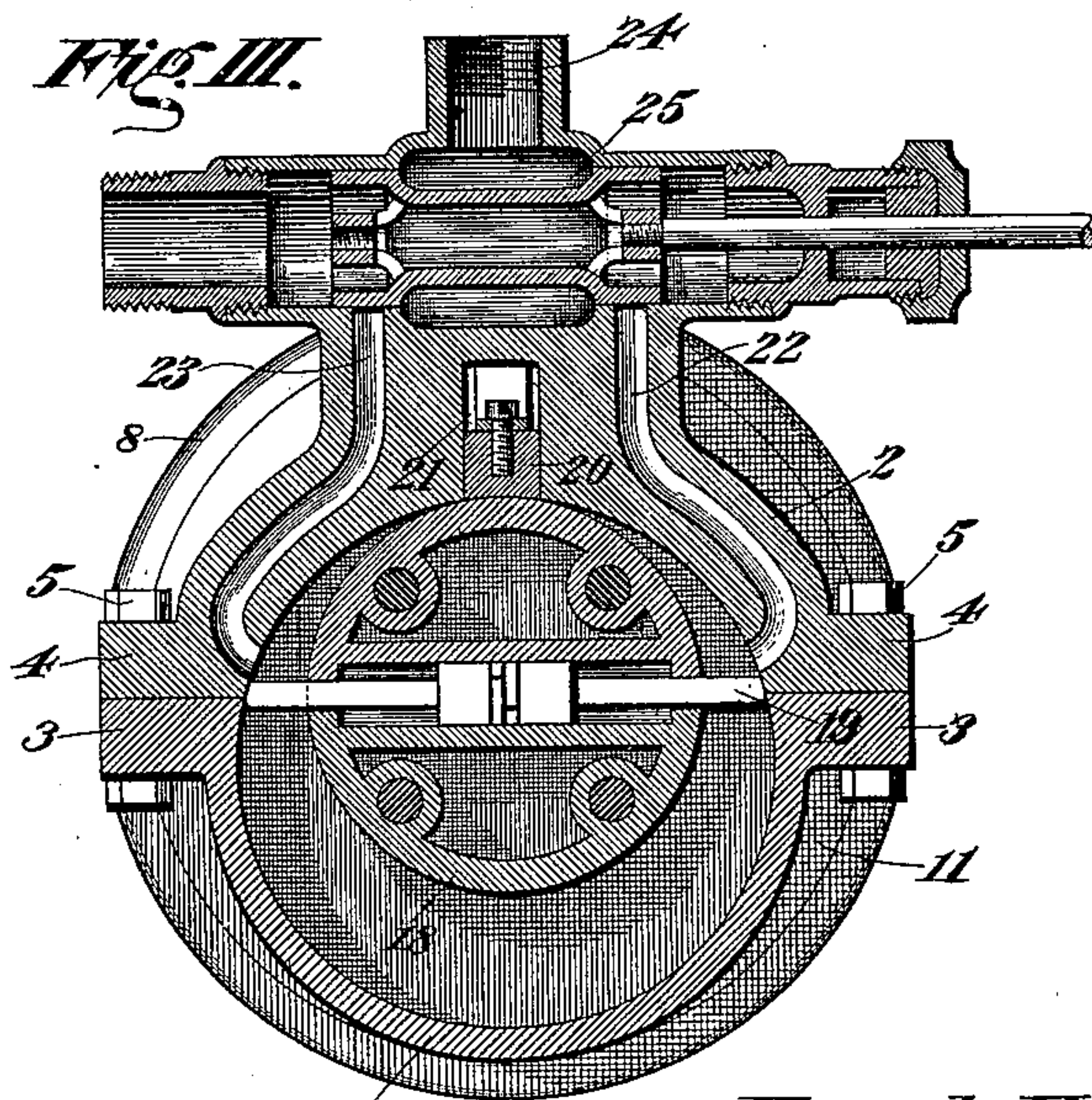
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*Fig. II.*



*Fig. III.*



Witnesses

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# UNITED STATES PATENT OFFICE.

FRANK H. CATHCART, OF ALEXANDRIA, VIRGINIA, ASSIGNOR TO THE  
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## POWER-DRIVEN TOOL.

SPECIFICATION forming part of Letters Patent No. 630,589, dated August 8, 1899.

Application filed July 8, 1897. Renewed July 3, 1899. Serial No. 722,697. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK H. CATHCART, of Alexandria, in the county of Alexandria and State of Virginia, have invented certain  
5 new and useful Improvements in Power-Driven Tools, of which the following is a complete specification, reference being had to the accompanying drawings.

The object of my invention is to produce an  
10 improved tool operated by a self-contained fluid motor or engine whereby the compactness, durability, and general efficiency are materially increased.

In the accompanying drawings, Figure I is  
15 a longitudinal central vertical section, with parts in elevation, of my machine. Fig. II is a section on the line II II of Fig. I. Fig. III is a section on the line III III of Fig. I.

Referring to the figures on the drawings, 1  
20 indicates one portion of a two-part cylinder, and 2 the other portion thereof. Each portion is provided with opposite longitudinal flanges 3 and 4, respectively, which are constructed to make close joints one with the  
25 other and when united, as by screw-bolts 5, to complete the cylinder.

The two-part cylinder above described is that form which I prefer to employ; but I do not limit myself to that particular construction. I prefer also to make the flanges 3 and  
30 4 shorter than the length of the cylinder-sections in order to provide spaces upon the opposite ends for exterior screw-threads 6. (See Fig. I.)

35 The screw-threaded ends 7 of the complete cylinder are adapted to accommodate internally-screw-threaded flanges or rims 8, that extend, respectively, in opposite directions from the cylinder-head cylinder-sections 9 and 10,  
40 respectively. The sections 9 and 10 are preferably formed integrally with end walls 11 and 12, respectively, which constitute, in effect, cylinder-heads. The wall 11 is provided with a closed bearing 13 or box, having an internal bushing 14. The wall 12 is provided  
45 with a cylindrical bearing 15, provided with a bushing 16. The bushings 14 and 16, being in concentric alinement, are adapted to accommodate a piston-shaft 17, which carries any  
50 preferred form of rotatory piston 18, provided with transverse blades or piston-heads 19.

20 indicates the fixed abutment-piece, which works in the peripheral depression 21 of the piston and operatively separates the  
55 ports 22 and 23.

24 indicates a fluid-supply-pipe connection adapted, by the aid of suitable valve mechanism, (indicated at 25,) to supply the actuating fluid—as, for example, steam or air—  
60 alternately to the ports 22 and 23 as required.

The mechanism above described does not constitute a part of my present invention herein described and claimed, but is illustrated by way of example of one form of embodiment of a rotary engine.  
65

Coming now to a description of that mechanism which constitutes the embodiment of my present invention, 26 indicates an extension-cylinder, which preferably constitutes a continuation of the section 9 and which preferably terminates in a cylinder-head 27,  
70 screwed or otherwise secured to the end of the extension-cylinder. The extension-cylinder accommodates a piston-head 28, to which is secured a piston-rod 29, which, working  
75 through a packing-box 30 in the cylinder-head, is connected with a suitable supporting-frame 31. In a thickened portion of the wall of the extension-cylinder I provide steam-supply passages 32 and 33, communicating with the  
80 valve-chamber 34, within which works a suitable valve—as, for example, the valve 35—controllable by means of a lever 36.

37 indicates an exhaust-port, and 38 a fluid-pressure supply-pipe communicating with the  
85 interior of the valve-chamber, included in the mechanism indicated at 25.

Through manipulation of the lever 36 steam may be admitted to one side or the other of the piston 28, thereby feeding the motor to or  
90 from its work, as required.

It is frequently desirable in adapting machines of the class to which my invention belongs to special uses to provide within the machine a form of reducing or multiplying  
95 gear which will not materially increase the size or weight of the machine or disfigure the symmetry of its exterior form. For this purpose I provide a spindle 39, which is revolvably carried in coaxial alinement with the  
100 shaft 17, and upon the contiguous end of the shaft a pinion 40, secured thereto. Meshing



with the pinion 40 I provide a gear 41 rotatably mounted, as upon a stud 42, the gear 41 being provided with or laterally secured to a second pinion 43. The second pinion meshes  
5 with a gear 44, that is secured to the spindle 39.

45 indicates a case which, in connection with the plate 46, made integral with the part 12, to which it is secured, as by bolts 47, in connection with the stud 42, protects the train of  
10 gear above described from the intrusion of dust or other deleterious substance.

By the arrangement above described I provide a compact and self-contained system of  
15 reducing-gear that may be concealed by the case 45 and which constitutes but a slight enlargement of the cylinder-head wall 12. Multiplying-gear could of course be substituted for that illustrated by substitution in the ordinary manner of proper gears and pinions.  
20

Through the employment of the sections 9 and 10, respectively, in the manner described I am not only able to increase the compactness and adaptability of my machine, but in  
25 that manner I am enabled to render the section 9, carrying the cylinder extension 26, and the section 10, carrying the reducing-gear, interchangeable with ordinary cylinder-heads, so that any engine of the ordinary type may  
30 be converted into a self-contained feeding-engine, or vice versa, simply through the interchange of the parts specified.

What I claim is—

1. The combination with a rotary-engine

cylinder and piston-shaft, of a cylinder-head 35 upon the cylinder, provided with a wall or diaphragm, and a closed shaft-box in the diaphragm for the piston-shaft, of a cylinder extension upon the cylinder-head coaxial with the shaft-box in the diaphragm, a piston work- 40 ing within the cylinder extension, a head upon the end of the cylinder extension, a piston-rod connected with the cylinder and passing through the head of the cylinder extension, a supporting-frame connected with the piston-rod, and means for supplying power alternately to the opposite sides of the piston, substantially as and for the purpose specified.

2. The combination with a terminally-screw-threaded cylinder, piston, and piston-shaft of 50 a rotary engine, of a terminally-threaded movable cylinder extension adapted to screw upon the end of the cylinder, a fixed piston within the movable cylinder coöperating therewith and a diaphragm within the cylinder extension provided with a closed shaft- 55 box to accommodate the piston-shaft, whereby interchange between the cylinder extension and an ordinary cylinder-head may be conveniently effected, as required, substantially as and for the purpose specified. 60

In testimony of all which I have hereunto subscribed my name.

FRANK H. CATHCART.

Witnesses:

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