

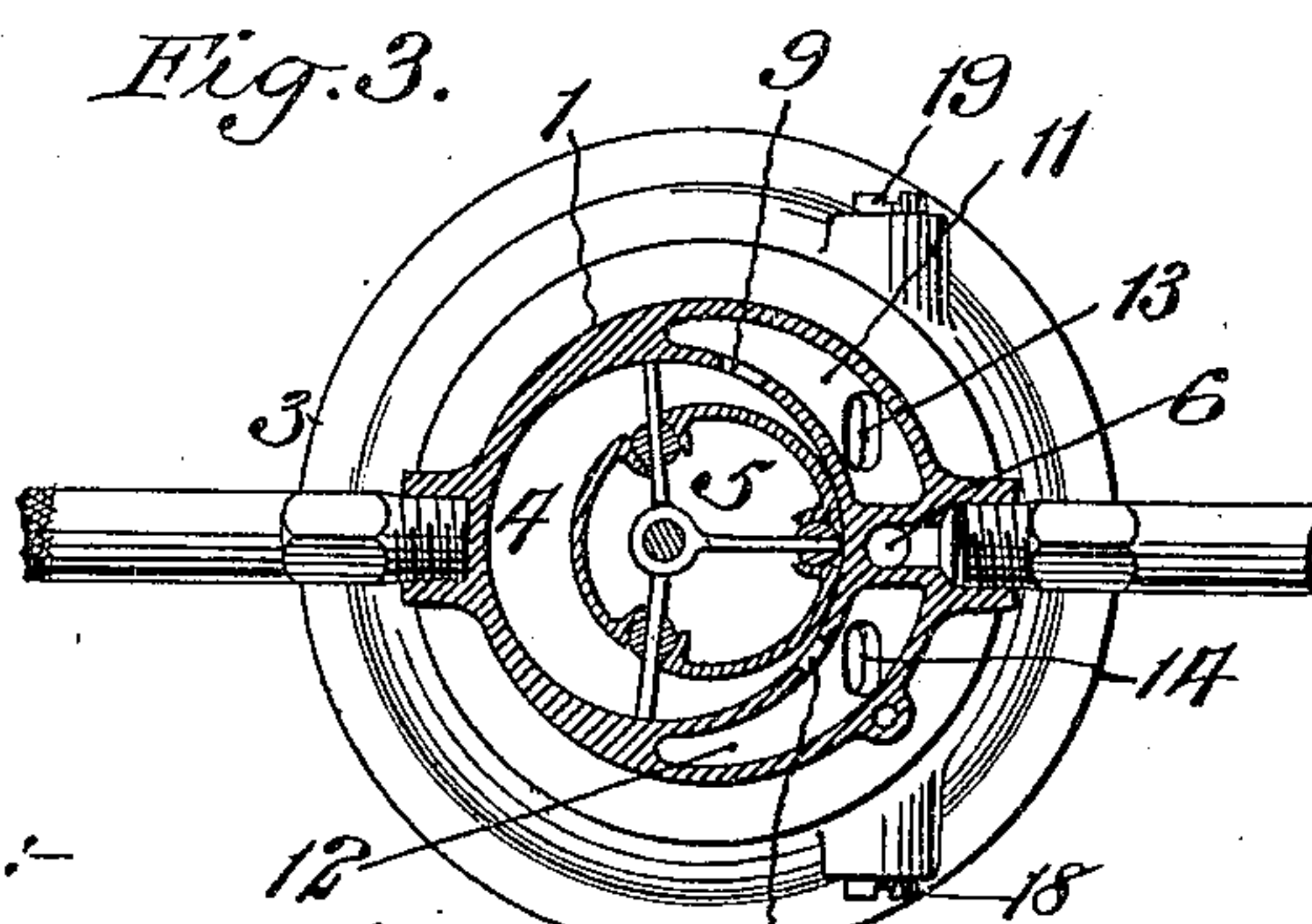
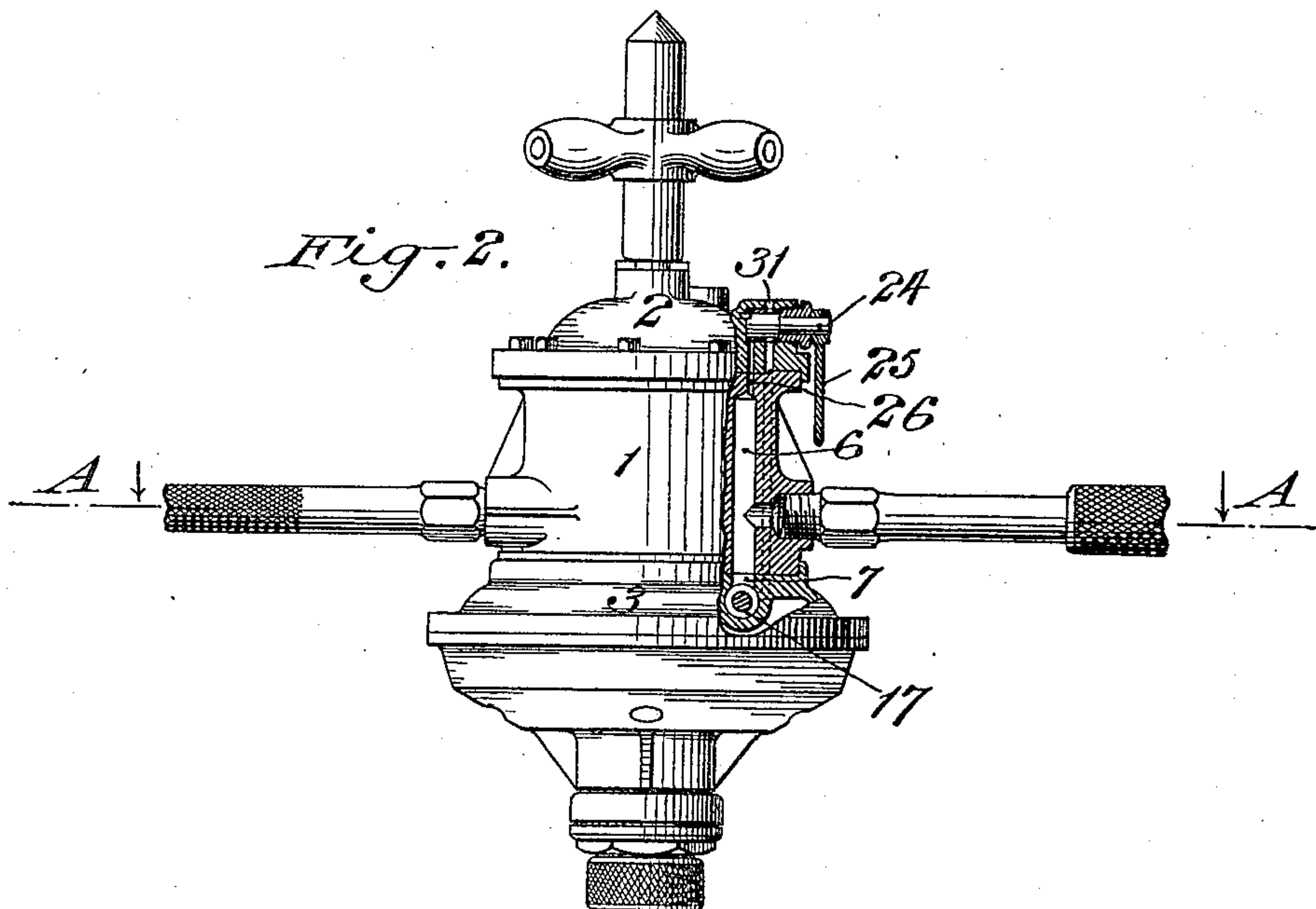
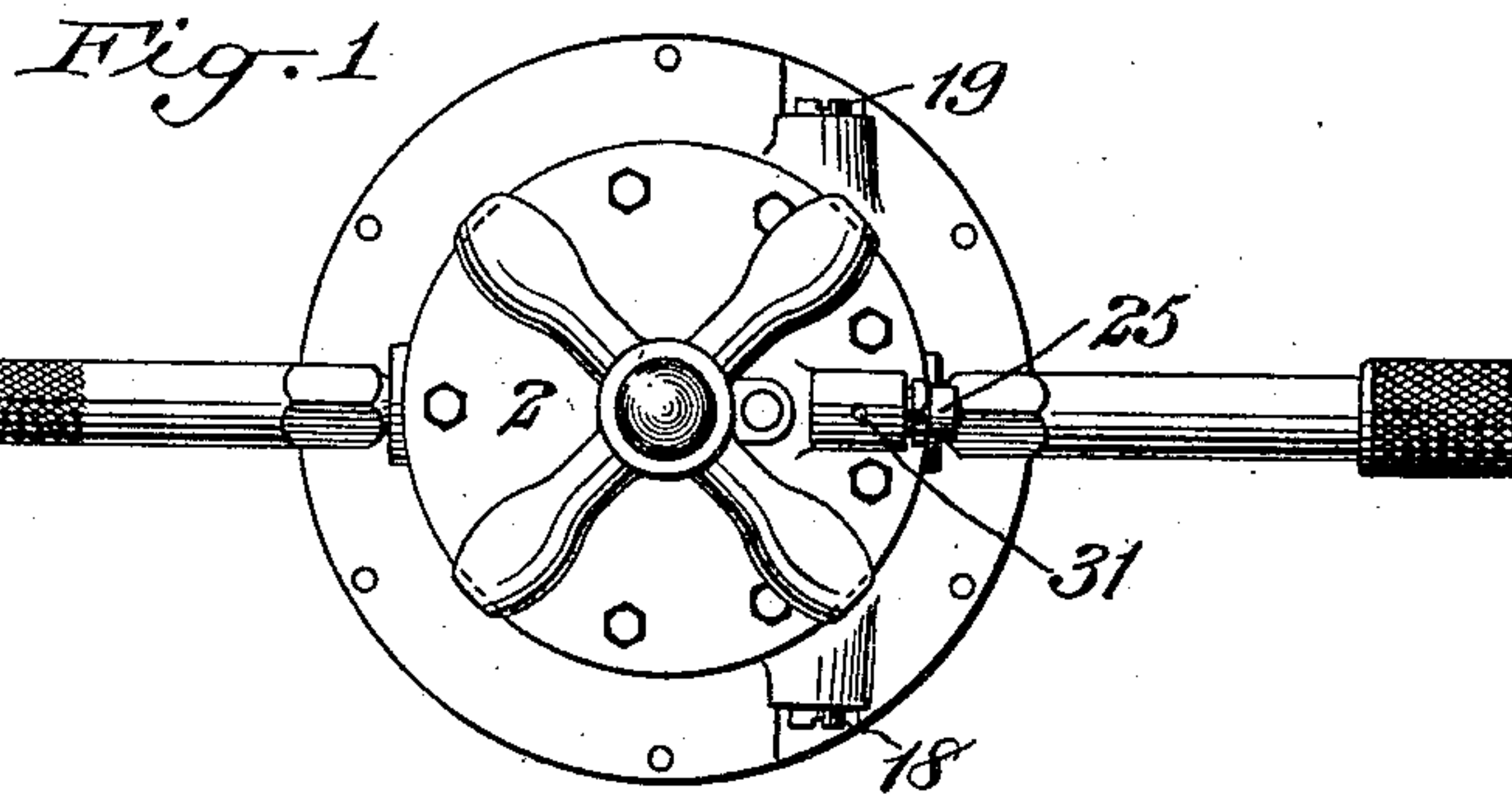
No. 810,890.

PATENTED JAN. 23, 1906.

A. H. TAYLOR.  
REVERSING MECHANISM FOR ROTARY MOTORS.

APPLICATION FILED JULY 14, 1905.

2 SHEETS—SHEET 1.



Witnesses:-  
J. George Barry,  
Henry Thieme.



Inventor:-  
Albert H. Taylor  
by attorney  
Morrat Seward

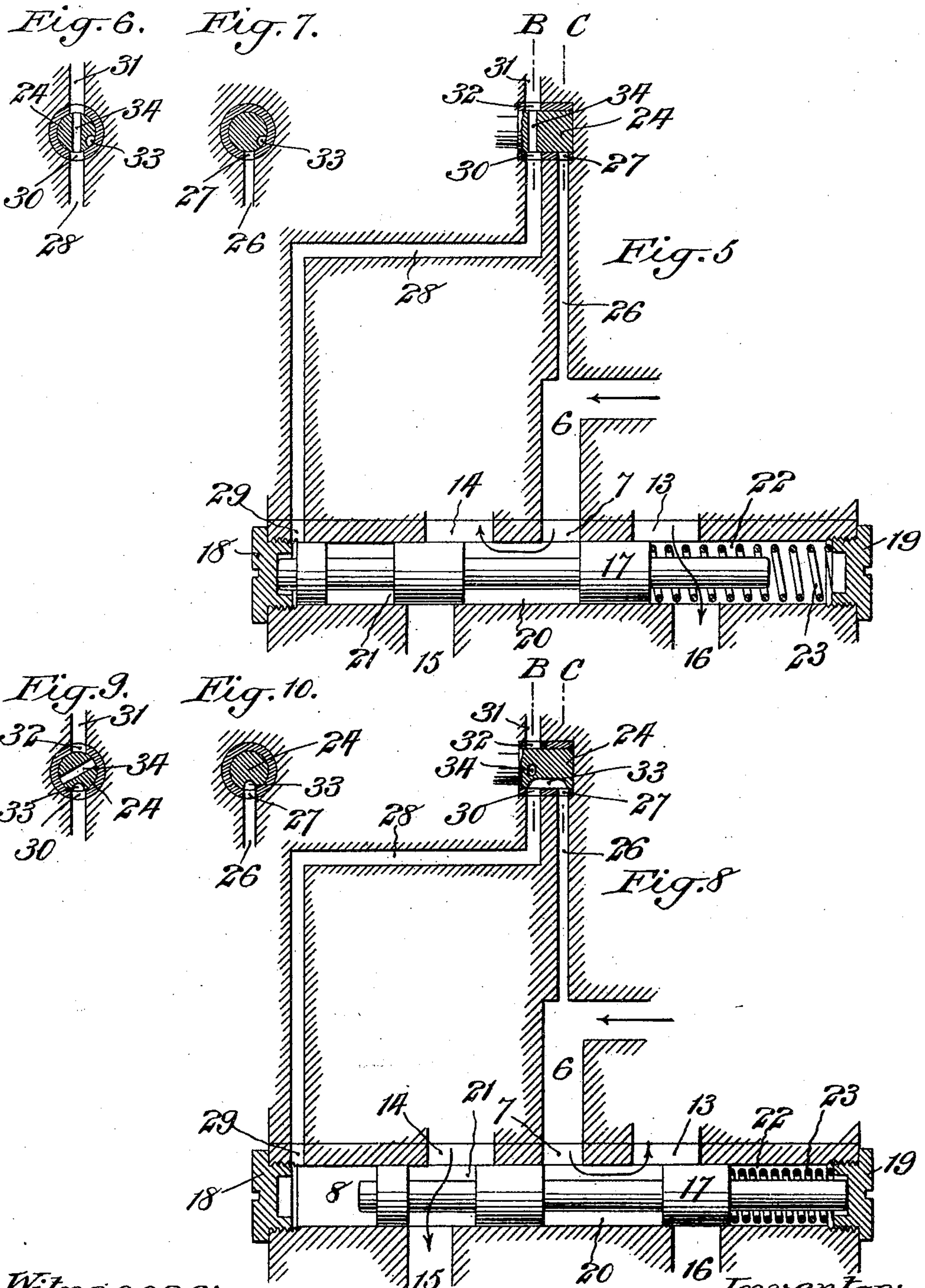
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J. George Barry  
Newry Thiele.

Inventor:  
Albert H. Taylor  
by attorneys  
Brown & Leonard



# UNITED STATES PATENT OFFICE.

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## REVERSING MECHANISM FOR ROTARY MOTORS.

No. 810,890.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Application filed July 14, 1905. Serial No. 269,607.

*To all whom it may concern:*

Be it known that I, ALBERT H. TAYLOR, a citizen of the United States, and a resident of Easton, in the county of Northampton and State of Pennsylvania, have invented a new and useful Reversing Mechanism for Rotary Motors, of which the following is a specification.

The object of my invention is to provide certain improvements in reversing mechanism for rotary motors in which the movements of the reversing-valve are controlled by a manually-operated auxiliary valve, the reversing-valve being located in one cylinder-head and the auxiliary valve in the other cylinder-head of the motor.

This invention is shown herein as applied to a pneumatic motor of the rotary-piston type adapted for use as a drill.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 represents in top plan a rotary pneumatic motor embodying my invention. Fig. 2 is a side view of the same, portions of the motor being broken away to more clearly show the positions of the valves therein. Fig. 3 is a horizontal section taken in the plane of the line A A of Fig. 2 looking in the direction of the arrows. Fig. 4 is a section taken through the lower cylinder-head in the plane of the reversing-valve. Fig. 5 is a diagrammatic view showing the positions which the parts assume when the motor is running in one direction. Figs. 6 and 7 are detail sections taken in the planes of the lines B and C, respectively, of Fig. 5. Fig. 8 is a diagrammatic view showing the positions which the parts assume when the motor is running in the reverse direction, and Figs. 9 and 10 are detail sections taken in the planes of the lines B and C, respectively, of Fig. 8.

The body of the pneumatic motor of the rotary-piston type in connection with which this invention is shown is denoted by 1, its upper cylinder-head by 2, and its lower cylinder-head by 3.

The piston-chamber is denoted by 4, and a piston 5 of any well-known or approved form is mounted eccentrically therein.

The passage for admitting the supply of

motive fluid to the motor is denoted by 6.

This passage is shown as disposed vertically in the wall of the body of the motor and is provided with a port 7, opening into the reversing-valve chamber 8 in the lower cylinder-head 3 of the motor. Communication is established between the reversing-valve chamber 8 and the piston-chamber 4 upon opposite sides of the contact-point of the piston with the wall of the chamber by means of ports 9 and 10 through the walls of the piston-chamber, which open into separated passages 11 and 12 in the body of the motor, and ports 13 and 14, which open from the said separated passages into the reversing-valve chamber 8. Exhaust-ports 15 and 16 also open from the reversing-valve chamber to the exterior.

The reversing-valve which is mounted in the chamber is denoted by 17. It is preferably confined in the chamber between two removable screw-caps 18 and 19, which close the opposite ends of the chamber 8. This valve 17 is provided with three ports 20 21 22, which are formed in the present instance by providing the valve with reduced diameters. The port 20 is arranged to open the port 7 to the port 13, leading to one side of the piston-chamber 4 when the valve is at the limit of its movement in one direction and arranged to open communication from the port 7 to the port 14, leading to the other side of the piston-chamber when the valve is at the limit of its movement in the other direction. When the ports 7 and 13 are opened, the port 14 is opened to the exhaust 15 through the valve-port 21. When the port 7 is open to the port 14, the port 13 is open to the exhaust 16 through the valve - port 22. A spring 23 is arranged to yieldingly hold the valve 17 at the limit of its movement in one direction for opening the ports in position to run the motor in a forward direction.

The means which I have shown for moving the valve in a direction to reverse the motor is constructed and arranged as follows: A manually - operated auxiliary valve 24 is mounted in the upper head 2 of the motor, which valve is provided with a handle 25 exterior to the motor for use in operating the same. In the present instance this valve is shown as a rocking plug-valve. A passage



26 leads from the fluid-pressure-inlet passage 6 to a port 27 opening to the face of the auxiliary valve 24. A second passage 28 leads to a port 29, which opens into the end of the reversing-valve chamber 8 to a port 30, which opens onto the face of the auxiliary valve 24. A third passage 31 leads to the atmosphere from a port 32, opening onto the face of the said auxiliary valve 24. This auxiliary valve 24 is provided with a bridge-port 33, arranged to open and close communication from the passage 26 to the passage 28, and a through-port 34, arranged to open and close communication from the passage 28 to the exhaust-passage 31. These ports are so arranged that when the passages 26 and 28 are in communication the passages 28 and 31 are closed, and vice versa.

In operation, supposing the parts to be in the positions in which they are shown in diagram in Fig. 5, with the reversing-valve held in its normal position by the spring 23, the motive fluid is open to the inlet side of the motor through the ports 7 and 14 and reversing-valve port 20. At the same time the exhaust side of the motor is open to the exhaust through the ports 13 and 16 and valve-port 22. The auxiliary valve 24 is in a position to close communication from the passage 26 to the passage 28. When it is desired to reverse the motor, the auxiliary valve 24 is turned to bring the passage 26 into communication with the passage 28. This will feed pressure into the reversing-valve chamber 8 in front of the valve and slide it back against the tension of its spring 23 until the port 7 is open to the port 13 and the port 14 is open to the port 15. It will be seen that the opening of these ports reverses the direction of the motor. When it is desired to again rotate the motor in a forward direction, the valve 24 is turned to close communication from the passage 26 to the passage 28 and to open communication from the passage 28 to the exhaust-passage 31. This will relieve the pressure on the reversing-valve and permit the spring 23 to move it into its original position.

It will be seen that by mounting the parts of the reversing mechanism in the cylinder-heads of the motor I am enabled to provide a very simple and convenient arrangement without the necessity of producing a complicated motor-cylinder. It will also be seen that the operation of the mechanism is extremely simple and positive and that the mechanism itself is readily accessible.

While I have shown this mechanism in connection with a pneumatic motor of the rotary-piston type adapted for use as a drill, it is to be understood that I do not wish to limit myself strictly to this construction; but

What I claim is—

1. A motor, means for supplying motive fluid thereto, a reversing-valve, a spring for

holding the valve at the limit of its movement in one direction and a manually-operated auxiliary valve for controlling the movements of the reversing-valve.

2. A motor, means for supplying motive fluid thereto, a reversing-valve, a spring for yieldingly holding the valve at the limit of its movement in one direction, means for supplying the motive fluid to the reversing-valve for moving it in the opposite direction and a manually-operated auxiliary valve for controlling the supply of motive fluid to the reversing-valve.

3. The combination with the cylinder and cylinder-heads of a rotary motor and means for supplying motive fluid thereto, of a reversing-valve located in one head and a manually-operated auxiliary valve located in the other head arranged to control the movements of the reversing-valve.

4. A motor, means for supplying motive fluid thereto, a reversing-valve, passages leading from the motive-fluid supply and the opposite sides of the motor piston-chamber to the face of the valve, a port in the valve for alternately opening communication from the fluid-supply passage to the one or the other of the motor piston-supply passages, exhaust-ports opening to the face of the said valve and ports in the valve for alternately opening communication from the one or the other of the motor piston-supply passages to the one or the other of the said exhaust-passages, a spring for moving the reversing-valve in one direction and means for controlling the supply of motive fluid for moving the valve in the opposite direction.

5. A motor, means for supplying motive fluid thereto, a reversing-valve, a spring for yieldingly holding the valve at the limit of its movement in one direction, a manually-operated valve, passages leading from the reversing-valve chamber and the motive-fluid-inlet passage to the face of the said auxiliary valve and ports in the said valve for alternately opening the passage from the motive-fluid supply to the reversing-valve passage and the reversing-valve passage to the atmosphere.

6. The combination with the cylinder and cylinder-heads of a rotary motor and means for supplying motive fluid thereto, of a reversing-valve located in a horizontal direction in one cylinder-head, a spring for holding the valve at the limit of its movement in one direction and a manually-operated auxiliary valve located in the other cylinder-head for controlling the movements of the reversing-valve.

7. The combination with the cylinder and cylinder-heads of a rotary motor and means for supplying motive fluid thereto, of a reversing-valve located in a horizontal direction in one cylinder-head, means for permitting the removal of the valve from the cylinder-

der-head, a spring for holding the valve at the limit of its movement in one direction and a manually-operated auxiliary valve located in the other cylinder-head for controlling the  
5 movements of the reversing-valve.

In testimony that I claim the foregoing as my invention I have signed my name, in pres-

ence of two witnesses, this 12th day of July, 1905.

ALBERT H. TAYLOR.

Witnesses:

C. S. SUNDGREN,  
FREDK. HAYNES.