

No. 664,374.

Patented Dec. 25, 1900.

J. F. BARKSTROM.

WIND MOTOR.

(Application filed June 25, 1900.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.

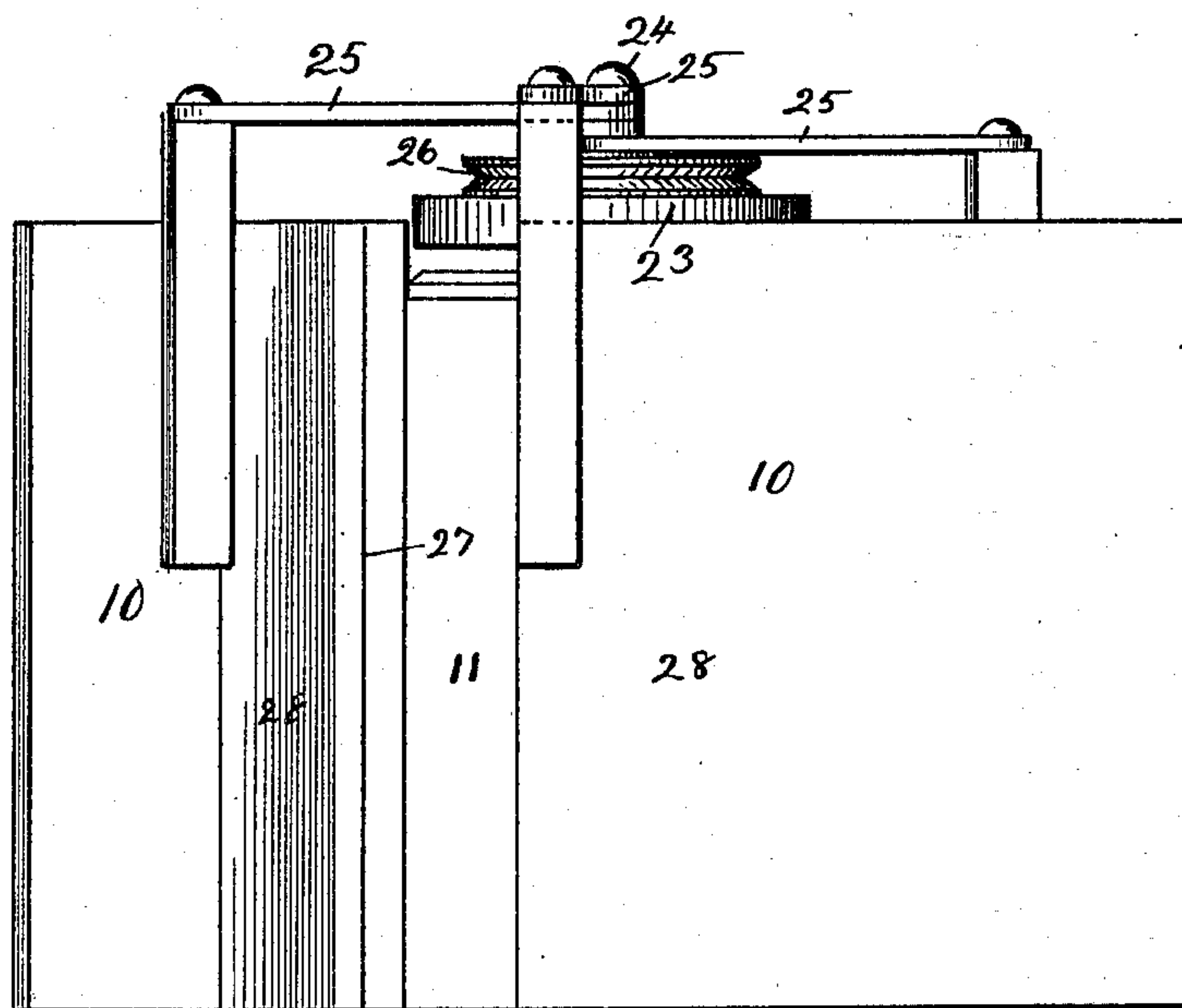
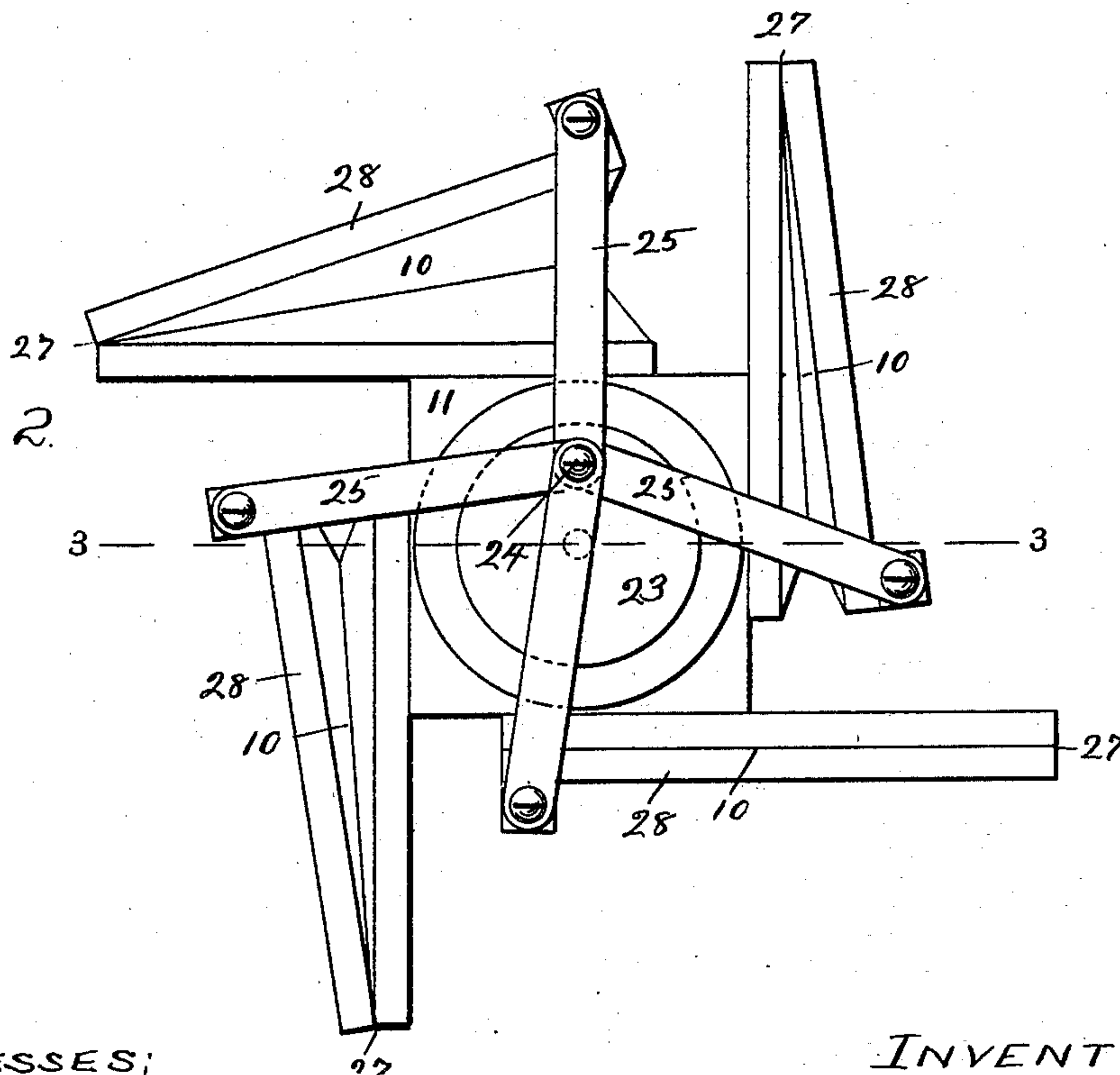


FIG. 2.



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FIG. 3.

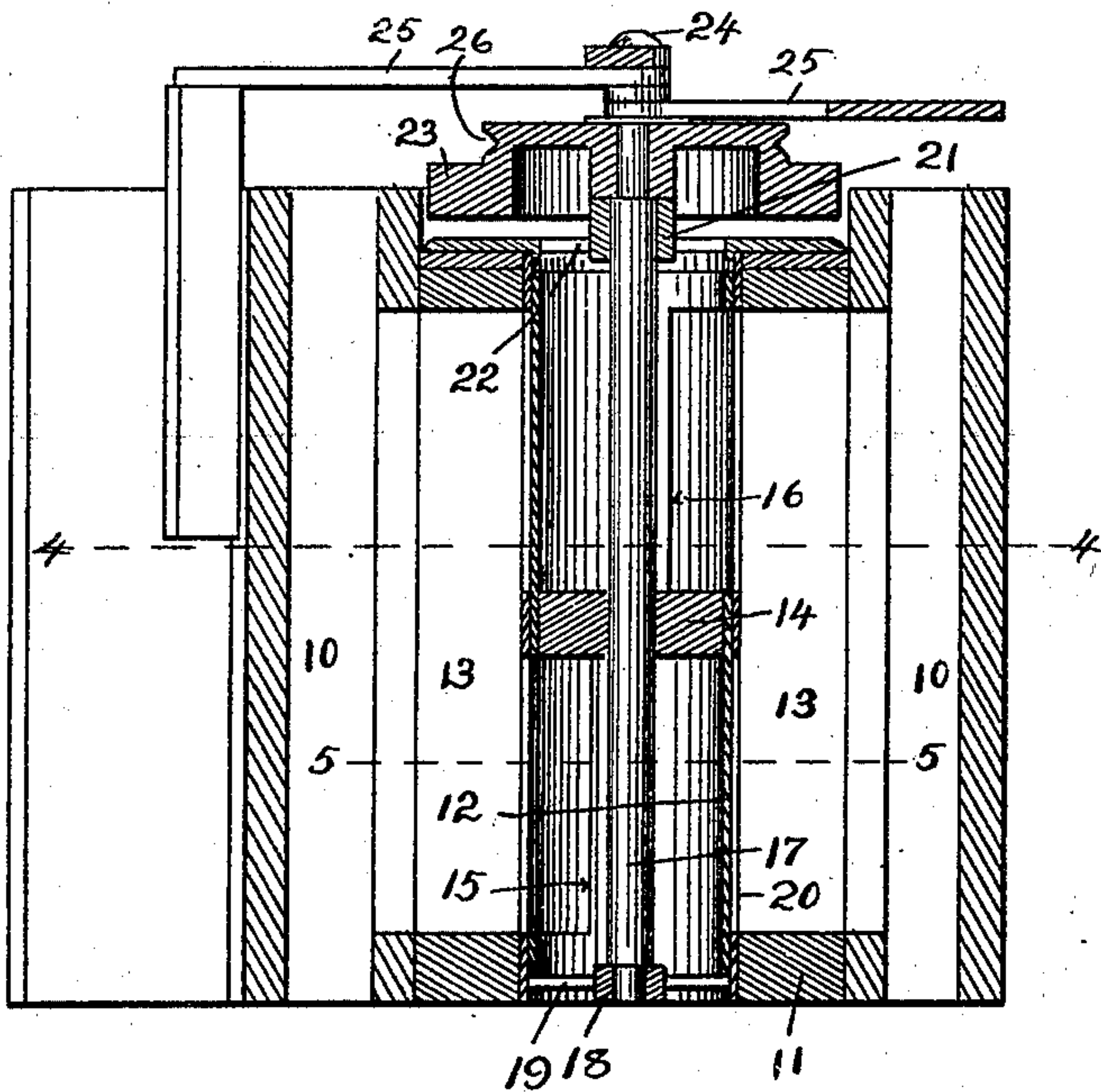


FIG. 5.

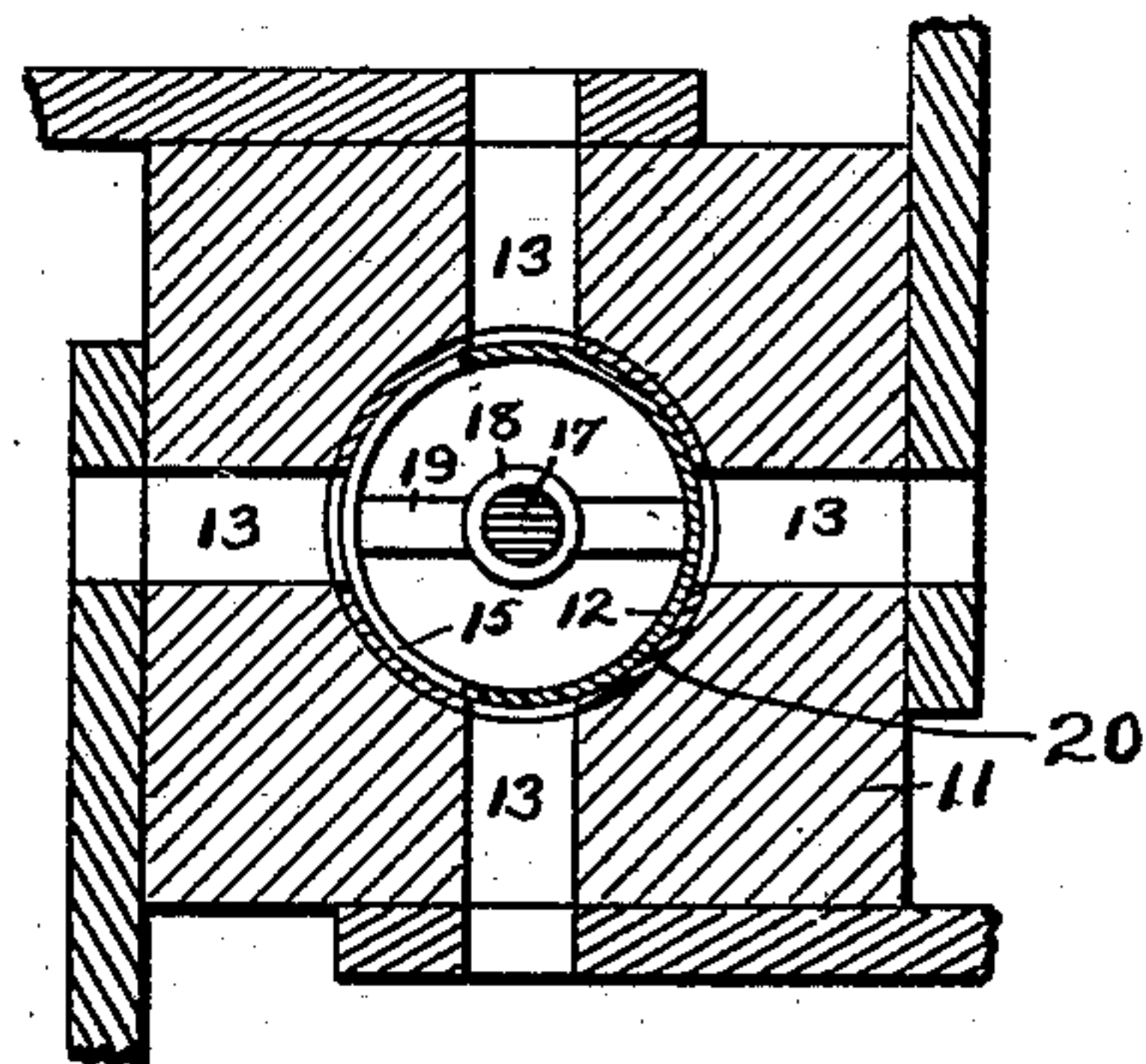
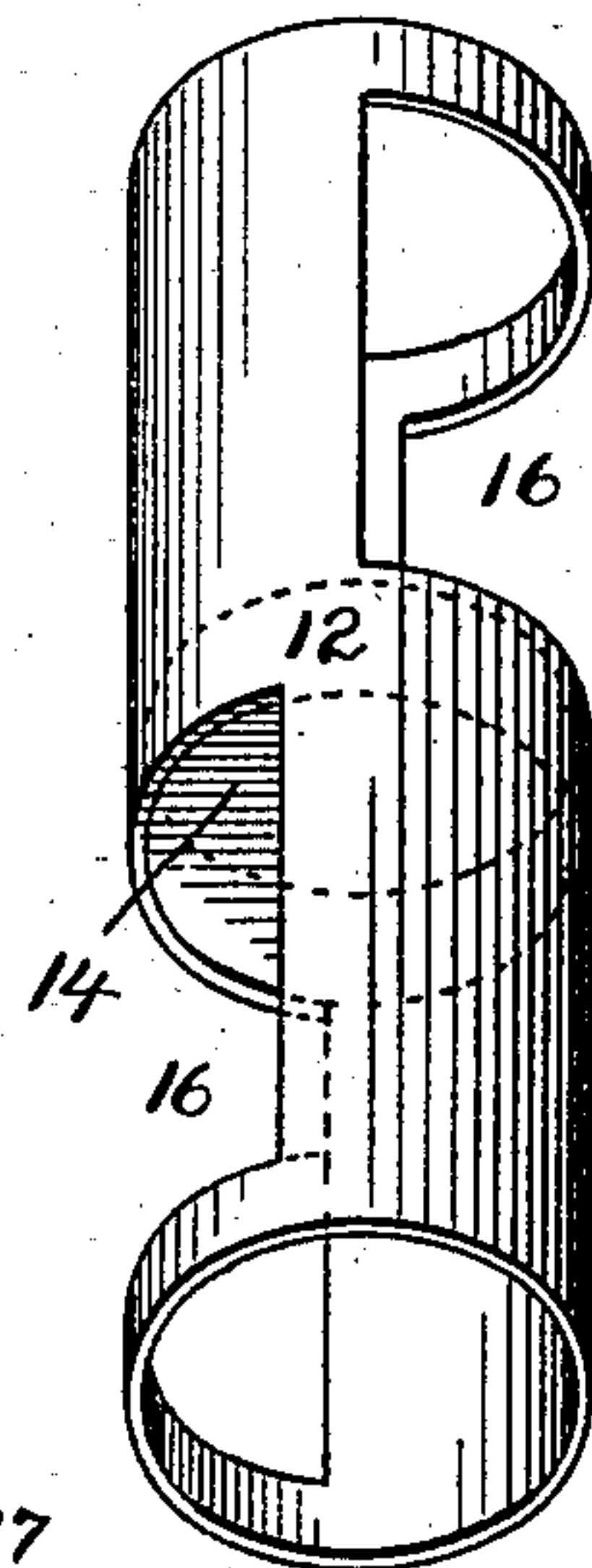
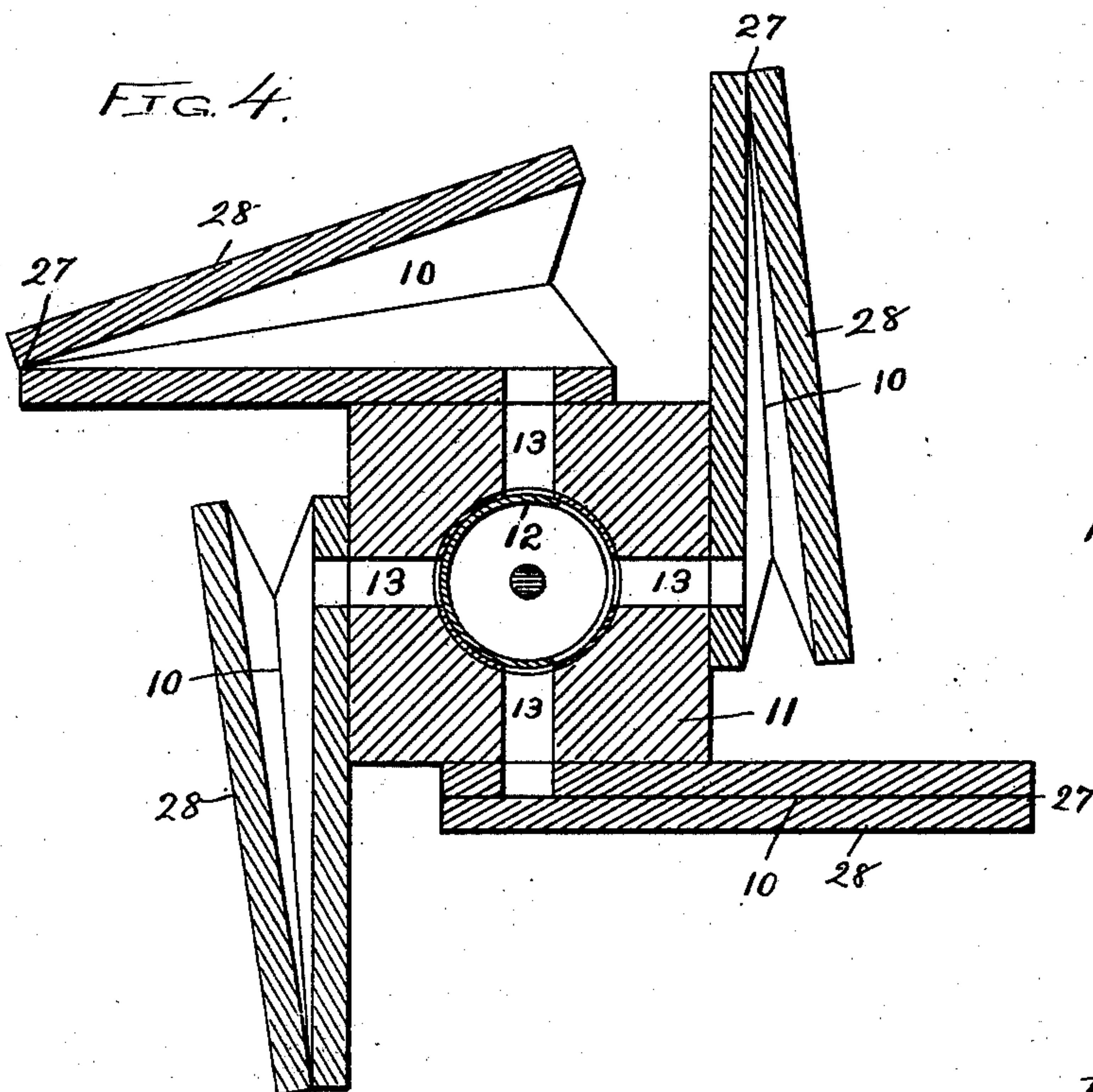


FIG. 6.



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UNITED STATES PATENT OFFICE.

JOHN F. BARKSTROM, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE W. W. KIMBALL COMPANY, OF SAME PLACE.

WIND-MOTOR.

SPECIFICATION forming part of Letters Patent No. 664,374, dated December 25, 1900.

Application filed June 25, 1900. Serial No. 21,460. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. BARKSTROM, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Wind-Motors, of which the following is a specification.

This invention relates to the construction of wind-motors, and has been devised more especially for use in operating the music-sheets of self-playing instruments.

The object of the invention has been not only to improve the construction of the motors generally, but specially to render them steady and free from jerkiness in operation, so that the music-sheet may be given a perfectly even and uniform movement.

The nature of the invention is fully set forth below and will also be understood from the accompanying drawings, in which—

Figure 1 is an elevation, and Fig. 2 a plan, of my improved motor. Fig. 3 is a vertical section on the line 3 3 of Fig. 2. Figs. 4 and 5 are sections on the lines 4 4 and 5 5, respectively, of Fig. 3. Fig. 6 is a perspective of the tubular valve employed.

In said drawings, 10 10 represent a series of pneumatics or power-bellows arranged around a valve-block 11, in the center of which is a vertical rotating tubular valve 12, communicating with each pneumatic by a separate passage 13. The valve is open at its ends and is also divided at the center by a close or imperforate partition 14, so that one end becomes the inlet end and the other the discharge end of the valve. The valve is cut away at opposite sides, so as to form a large inlet-port at 15 and a similar outlet-port at 16. The valve is supported upon a central vertical shaft 17, stepped at its bottom in a bearing 18, supported by the arms 19 from a surrounding metal cylinder 20, inserted in the block 11 and having slots registering with the passages 13. The shaft is made fast in partition 14, so that the valve and shaft necessarily rotate together, and the shaft is also provided with a top bearing 21, supported by the spider 22. At its upper end the shaft carries a combined crank, pulley, and balance-wheel 23, having a crank-pin 24, to which all the pneumatics are united by con-

necting-bars 25 25, so that each pneumatic contributes its share of power to the operating of the wheel. The power is taken from the wheel by a belt (not shown) running in the groove 26 of the wheel. I prefer to make this wheel of sufficient weight and size, as shown, so that it will impart steadiness to the motion.

The pneumatics are preferably arranged tangentially of and horizontally around the valve and with the hinges 27 of their movable sides 28 standing vertically and parallel with the axis of the valve. This arrangement is very desirable with the rotating valve shown, as it places all the pneumatics at the same distance from the valve, so that all work with the same quickness, and minimizes the effect of gravity on the moving sides.

In the operation of the device when the valve admits air to the passage 13 of any pneumatic it also closes the same passage against any discharge, and when it opens the passage to discharge it shuts off entrance of fresh air, the valve thus alternating in its action with each pneumatic, so that each is alternately inflated and deflated, and by acting thus upon the pneumatics in successive order the desired rotary motion of the valve, shaft, and wheel is caused. The valve opens and closes the ports gradually, and thereby avoids imparting sudden impulses to the wheel.

While the arrangement of the pneumatics around the valve and shaft 17 with the hinges parallel to the axis of the valve is a very desirable one, I do not wish to be limited thereto except in such of my claims as expressly call for that arrangement, nor do I wish to be limited to the vertical arrangement of the shaft and valve, nor to the use of four pneumatics, as obviously the number may be varied.

I claim—

1. The wind-motor, wherein are combined a series of pneumatics and a rotating valve located centrally of the pneumatics and controlling all of them, the moving side of the pneumatics swinging on hinges arranged parallel with the axis of the valve, substantially as specified.

2. The wind-motor, wherein are combined a series of pneumatics and a rotating valve located centrally of the pneumatics and controlling all of them, the pneumatics standing

tangentially of the valve-chamber and having the hinges of their moving sides arranged parallel with the axis of the valve, substantially as specified.

5 3. The wind-motor, wherein are combined a series of pneumatics and a rotating valve connected to and controlling them, the moving side of the pneumatics swinging on hinges arranged parallel with the axis of the valve,
10 substantially as specified.

4. The wind-motor, wherein are combined a series of pneumatics, a shaft driven by the motor and a tubular valve mounted on the shaft, and acting to control all the pneumat-
15 ics, said valve being transversely divided into inlet and exhaust portions, and both said portions communicating with the pneumatics by passages 13, substantially as specified.

5. The wind-motor, wherein are combined
20 a series of pneumatics, a rotating valve located centrally of the pneumatics and controlling all of them, and a crank-disk connected to said valve and operated by the pneumatics and acting as a fly-wheel to the motor, sub-
25 stantially as specified.

6. The wind-motor, wherein are combined a series of pneumatics and a rotating tubular valve arranged centrally of the pneumatics and controlling all of them, and divided by a
30 partition into an inlet portion and an outlet portion, substantially as specified.

7. The wind-motor, wherein are combined

a series of pneumatics and a rotating tubular valve arranged centrally of the pneumatics and controlling all of them, one end of said 35 valve controlling the admission and the other end controlling the exhaust of the air, and a valve block or casing having suitable air-passages 13 connecting the valve with the pneumatics, substantially as specified. 40

8. The wind-motor, wherein are combined a series of pneumatics and a rotating tubular valve arranged centrally of the pneumatics and controlling all of them, said valve having a central partition and having its ends cut 45 away at opposite sides, and a valve casing or block having air-passages 13 connecting the ends of said valve with the pneumatics, substantially as specified.

9. The wind-motor, wherein are combined 50 a series of pneumatics, a shaft driven by the motor, and a tubular valve mounted on the shaft and acting to control all the pneumatics, said valve being open at its ends, and divided transversely, into inlet and outlet por- 55 tions, and said portions having alternately-acting ports communicating with the passages leading to the pneumatics, substantially as specified.

JOHN F. BARKSTROM.

Witnesses:

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JOHN WILLIAMSON.