No. 690,798. Patented Jan. 7, 1902.

H. W. VAN AUKEN.

ROTARY ENGINE.

(Application filed May 31, 1901.)

(No Model.)

Fig. 1.

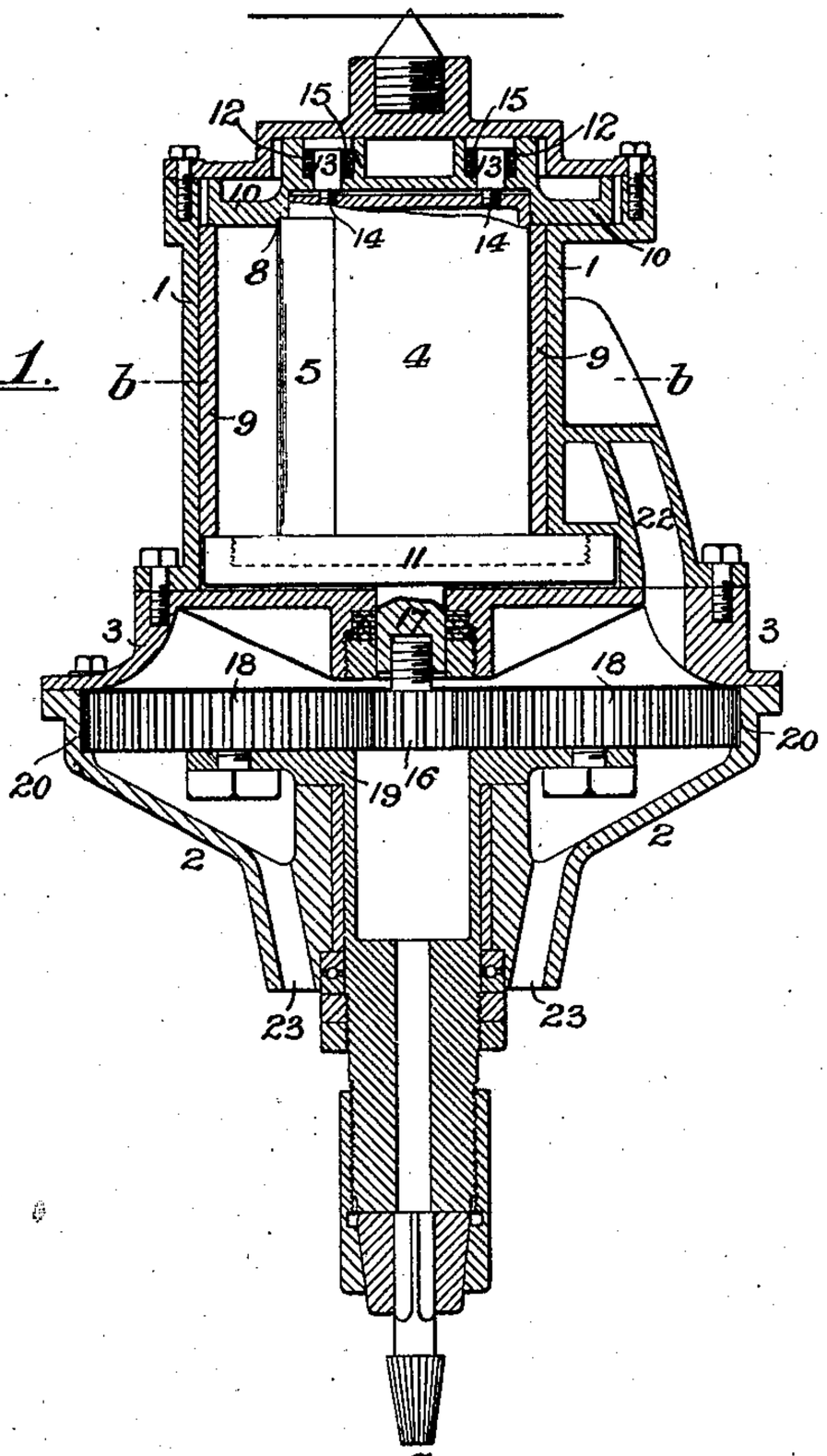
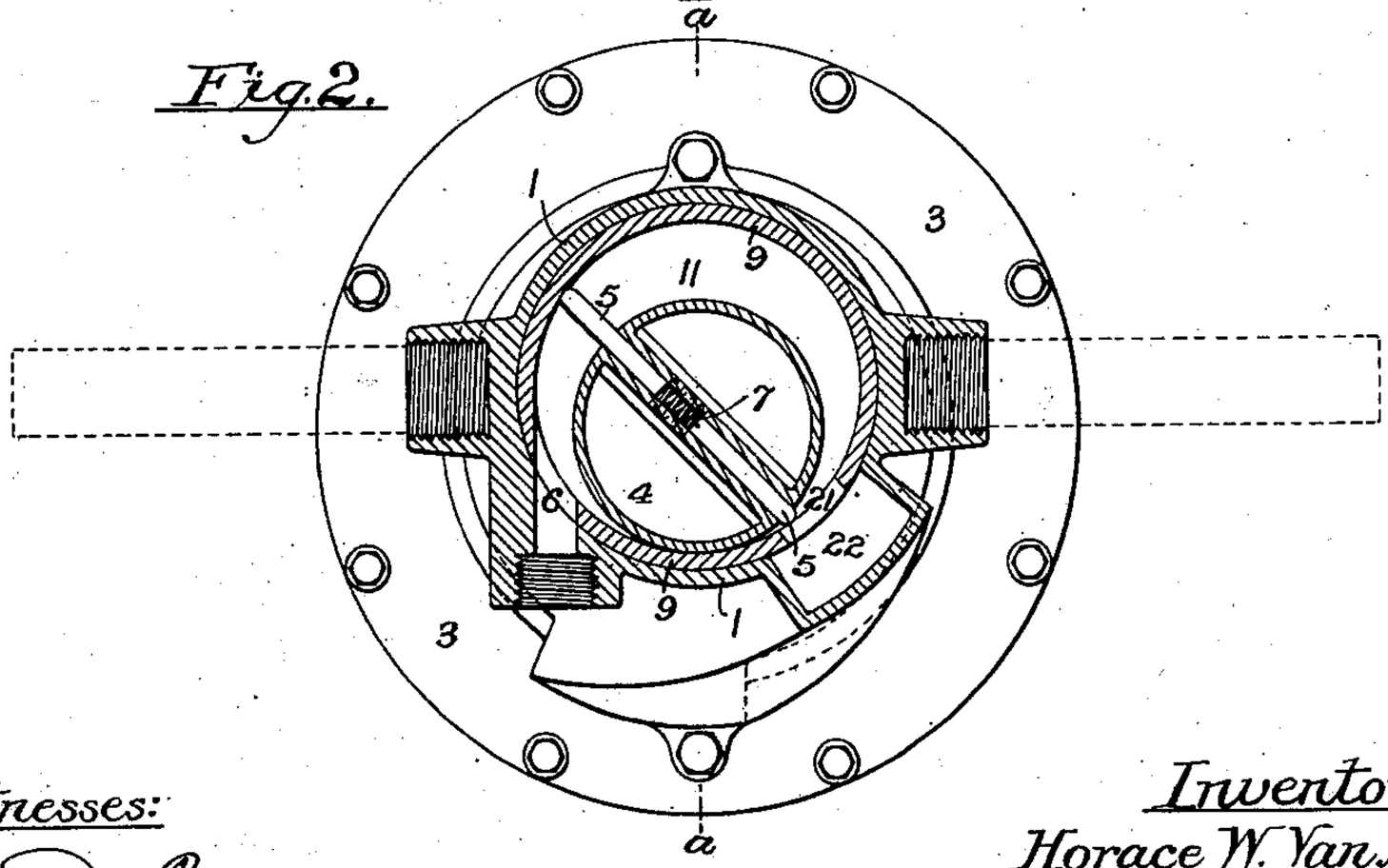


Fig. 2.



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UNITED STATES PATENT OFFICE.

HORACE W. VAN AUKEN, OF PHILADELPHIA, PENNSYLVANIA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 690,798, dated January 7, 1902.

Application filed May 31, 1901. Serial No. 62,600. (No model.)

To all whom it may concern:

Be it known that I, HORACE W. VAN AUKEN, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Rotary Air-Engines, of which the following is a specification.

My invention relates to that class of rotary air-engines employed for driving reaming or drilling tools.

My invention comprises certain improvements in such class of air-engines whereby I am enabled to take up the end thrust of the rotating piston and compensate for the wear of the same, increase the movement of the transmitting-gears, and provide means for directing the exhaust in such manner that it will clear the metal chips away at the cutting-point of the tool and at the same time cool such tool.

My invention is fully illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of my improved tool, taken on the line *a a*, Fig. 2; and Fig. 2 is a sectional plan view of said tool, taken on the line *b b*, Fig. 1.

In the drawings, 1 represents the upper portion of the casing, 2 the lower portion of the casing, and 3 an intermediate casing-section, to which the upper and lower portions are connected by means of suitable bolts and nuts. The upper portion of the casing forms the cylinder in which the drum 4 is adapted to rotate, said drum carrying the piston-blades 5, which engage the walls of said cylinder and against which blades the motive fluid entering at 6 may strike, and thereby rotate said drum. These piston-blades 5 are maintained in contact with the walls of the chamber by means of centrally-disposed springs 7, and I prefer to arrange said blades so as to be free to slide in grooves 8, cut in the flanges of said drum. I prefer to line the cylinder with a hardened-steel bushing 9, as the greatest amount of wear comes at this point. As the piston-blades are held out by means of the springs 7, they will always engage this bushing, no matter what the wear may be.

The drum 4 is provided with flanges 10 and 11, between which the hardened-steel bushing is arranged. As these flanges rotate with the drum, means must be provided for preventing leakage when any wear occurs between the bushing and said flanges. For this purpose I provide a series of apertured depressions 12 in the upper flange 10, and adapted to these depressions are headed pins 13, threaded at 14 into the drum 4. Between said flange and the head of these pins I arrange coiled springs 15, which always tend to hold these parts in close contact with each other, and as this tendency is maintained during the operation of the tool the parts will be kept practically air-tight at all times.

The mechanism for driving this tool is of the usual character employed for driving other tools of the same class and comprises simply a pinion 16, carried by the spindle 17 of the flange 11, which pinion meshes with the gear-wheels 18, journaled in a frame 19, which carries the tool-chuck, and these wheels 18 mesh with an internal rack 20, carried by the casing. These parts are always driven in one direction, and I have discovered that I can assist the rotation of the same by directing the air exhausting from the piston-chamber in the line of movement of the transmitting-gears. The air exhausts from said chamber at 21, and I arrange at the side of the casing 1 a passage 22, which leads from said exhaust-opening to the interior of the intermediate casing-section 3, just above the transmitting-gearing, and all exhausting air passes through this channel.

I have found it decidedly advantageous, both for the purpose of clearing away the chips and also to cool the working end of the tool, to provide means for directing the exhausting motive fluid at or near the working point of said tool. For this purpose I cut a series of inclined apertures 23 through the lower portion 2 of the casing, such apertures being inclined in such a direction that the exhausting air will be discharged directly at the cutting-point of the tool.

It is not new to provide the lower portion of the casing with the downwardly-discharging exhaust-openings; but so far as I know these openings have never been arranged in a fixed casing and inclined so that the exhausting motive fluid will clear away the chips and cool the cutting part of the tool.

I prefer to arrange the inlet and exhaust openings for the motive fluid as shown in the accompanying drawings, whereby such motive fluid will be directed tangentially, entering and leaving the cylinder along the line of least resistance.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination in a rotary air-engine, of the casing, a rotating drum within the same, flanges carried by said drum, a bushing forming the inner wall of the casing arranged between said flanges, and self-adjusting means between the upper flange and the drum whereby any wear between these parts may be compensated for during the operation of the tool.

2. The combination in a rotary air-engine of the character described, of the casing, a rotatable drum arranged therein, flanges carried by said drum, a hardened-metal bushing arranged between said flanges, headed pins carried by the drum and extending through one of the flanges and springs interposed between the heads of said pins and the flange whereby any wear between the parts may be taken up and an air-tight fit assured at all times.

3. In a rotary air-engine of the character described, the combination of the cylinder or casing, a rotating drum within said casing, movable vanes or blades carried by said drum by which the latter is driven by the aid of motive fluid under pressure, a driving-pinion carried by said drum and serving to actuate transmitting-gearing whereby the movement of the drum may be conveyed to a cutting instrument carried by the engine, said casing having a passage leading from the side of the same adjacent to the rotating drum, to the chamber containing the transmitting-gearing, whereby the exhausting motive fluid may be discharged upon said transmitting-gearing in the direction in which said gearing is moving.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HORACE W. VAN AUKEN.

Witnesses:
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