April 1, 1924. 1,488,528

L. CARDINI

PNEUMATIC ROTARY MOTOR

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Fig. 2.

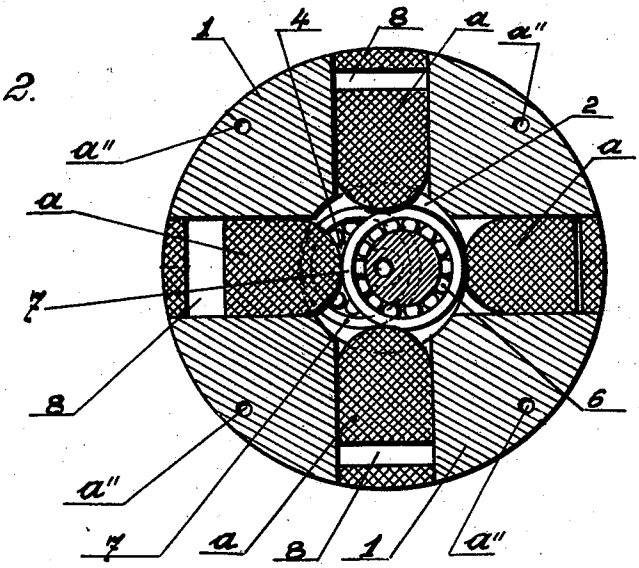
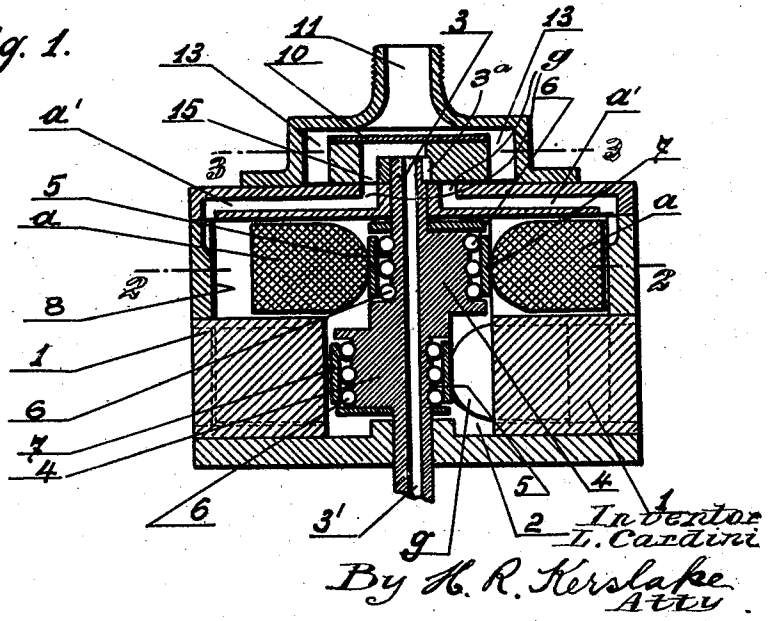


Fig. 1.



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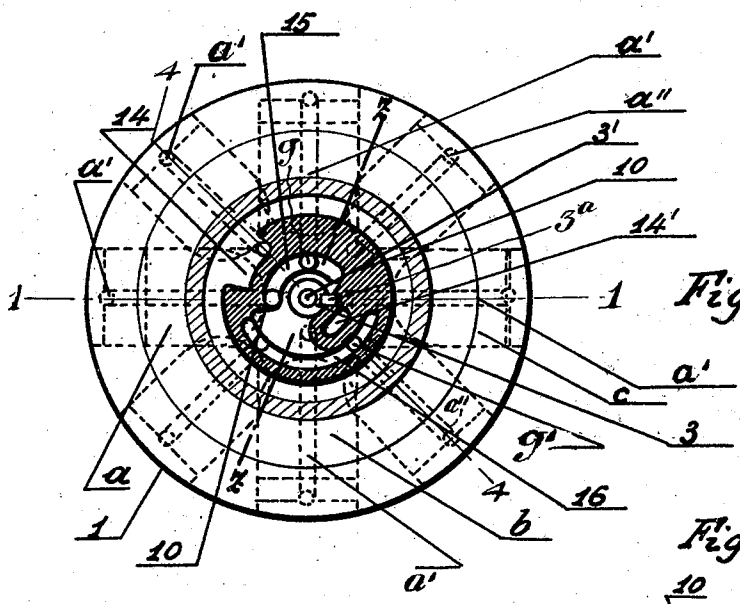


Fig. 3.

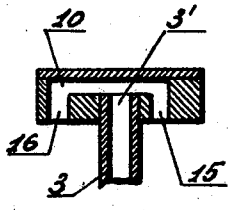


Fig. 5.

Fig. 4.

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Patented Apr. 1, 1924. 1,488,528

UNITED STATES PATENT OFFICE.

LUIGI CARDINI, OF MILAN, ITALY.

PNEUMATIC ROTARY MOTOR.

Application filed August 7, 1920. Serial No. 401,841.

To all whom it may concern:

Be it known that LUIGI CARDINI, a subject of the Kingdom of Italy, residing at Milano, Corso Buenos Ayres 10, Italy, has invented certain new and useful Improvements in Pneumatic Rotary Motors, of which the following is a specification.

This invention relates to improvements in rotary pneumatic motors and the primary object of the invention is to provide a motor of simple and inexpensive construction which may be driven at high speed without liability of injuring any of the parts.

With the foregoing object outlined and with other objects in view which will appear as the description proceeds, the invention consists of the novel features hereinafter described in detail, illustrated in the accompanying drawings and more particularly pointed out in the appended claim.

Referring to the drawings:

Figure 1 is a vertical sectional view of the improved motor taken on the line 1—1 of Fig. 3;

Fig. 2 is a horizontal sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a vertical sectional view taken on line 4—4 of Fig. 3; and,

Fig. 5 is a detail sectional view of the distributing valve employed in connection with the motor.

In the drawings 1 designates a block or casing provided with an internal cylindrical bore 2 having its ends closed by portions of the casing 1. Mounted in the casing 1 and extending through the bore 2 is a rotatable shaft 3 provided with an internal fluid passageway 3′ that functions as the exhaust pipe of the motor. The shaft is provided with a plurality of eccentrics 4 around which are arranged collars 7, and ball bearings 5 and 6 are arranged between the eccentrics and the collars so as to prevent friction.

The casing 1 is provided with two series of radially arranged bores 8 in which are slidably mounted pistons *a*. It is to be noted that the bores 8 of the upper series are arranged at 45° relatively to the bores of the lower series.

The outer ends of the bores of the lower series communicate with air passageways *a″*, the upper ends of which terminate in ports *g′* which are arranged at 90° apart around the axis of the shaft 3. The outer ends of the bores 8 of the upper series communicate with similar air passageways *a′* which terminate in ports *g* which are also arranged at 90° apart around the axis of the shaft 3 and are located nearer to the shaft than the ports *g′*. Attention is called to the fact that each port *g* is arranged between two of the ports *g′*.

Arranged at the head of the casing is a valve casing having an internal annular chamber 13 and an inlet passageway 11. A disk valve 10 is arranged within the chamber 13 and fixed to the shaft 3 by means of a key 3ª. As best shown in Fig. 3 the valve is provided with a peripheral notch 14 and a conduit 14′, the notch and conduit as best shown in Fig. 4 extending from the top to the bottom surface of the valve. The valve is also provided with a curved passageway 15 that is arranged close to the axis of the shaft 3. Another curved passageway 16 is arranged further away from the axis of the shaft 3 and communicates with the passageway 15. Both passageways 15 and 16 communicate at all times with the exhaust passageway 3′.

In operation, air or other motive fluid enters the chamber 13 and flows through the notch 14 or port 14′ into one or the other of the passageways *a′* and *a″* and thus enters the outer end of one of the bores 8 and acts on the piston contained therein. The piston forces the eccentric 4 with which it cooperates to move and thus results in an angular rotation of the shaft 3.

This rotation causes the valve 10 to uncover a succeeding port *g* or *g′* and the motive fluid then enters another bore 8 through the port last uncovered, while the valve covers the port first opened and one of the passageways 15 or 16 communicates with the port first opened to permit the fluid to exhaust from the bore to which the fluid was first admitted.

From the foregoing I believe that the construction, arrangement and advantages of the invention may be readily understood by those skilled in the art, and I am aware that various changes may be made in the construction illustrated without departing from the spirit of the invention as expressed in the following claim.

What I claim and desire to secure by Letters Patent is:

A fluid power motor comprising a casing provided with a central bore and series of

radially arranged bores communicating therewith, the bores of one series being arranged at 45° relatively to the bores of the other series and the series being in parallel planes perpendicular to the axis of the central bore, a rotatable shaft extending through said casing, oppositely arranged eccentrics mounted on said shaft, rings surrounding said eccentrics, anti-friction rolling elements between the eccentrics and rings, pistons slidably mounted in said bores and engaging said rings, said pistons being unsecured to one another or to said rings, a passageway connected to the outer end of each of the radial bores and extending to one end of the casing, the passageways of the bores of one series terminating nearer to the axis of the central bore than the passageways of the bores of the other series, a valve casing mounted on one end of the first mentioned casing and having an inlet, a disk valve fixed to said shaft and rotating within the valve casing, said shaft being hollow and the valve being provided with arc-shaped exhaust passageways in constant communication with the hollow interior of said shaft, one of said arc-shaped exhaust passageways having a shorter radius than the other arc-shaped exhaust passageway and adapted to cooperate with the passageways of the radial bores which terminate nearest the axis of the central bore, said valve being also provided with a peripheral notch and a port for admitting motive fluid to the passageways which communicate with said radial bores.

In testimony whereof I affix my signature.

LUIGI CARDINI.