C. W. VOLLMANN.

ROTARY PUMP.

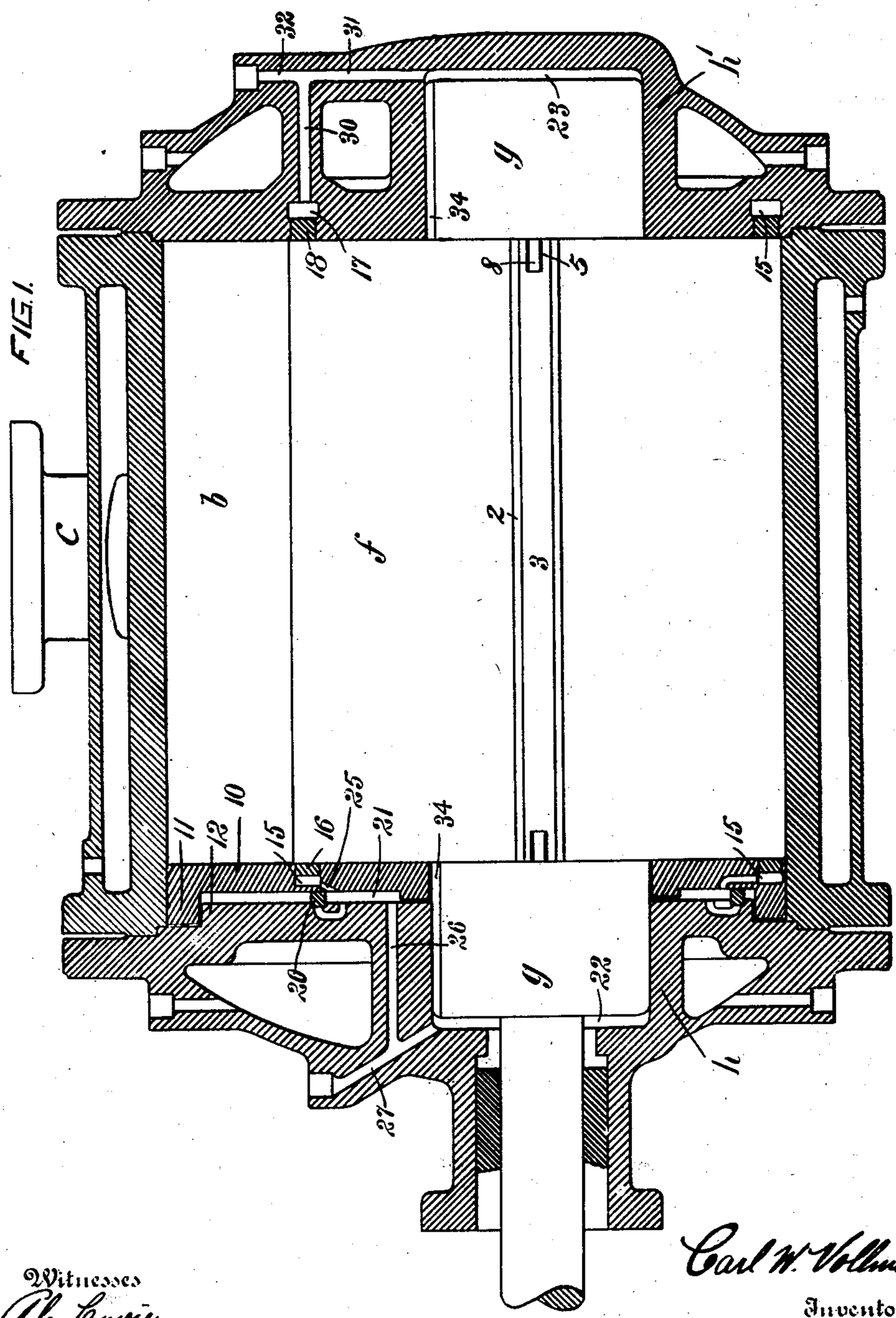
APPLICATION FILED APR. 18, 1904.

944,708.

Patented Dec. 28, 1909.

3 SHEETS—SHEET 1.

FIG. 1.



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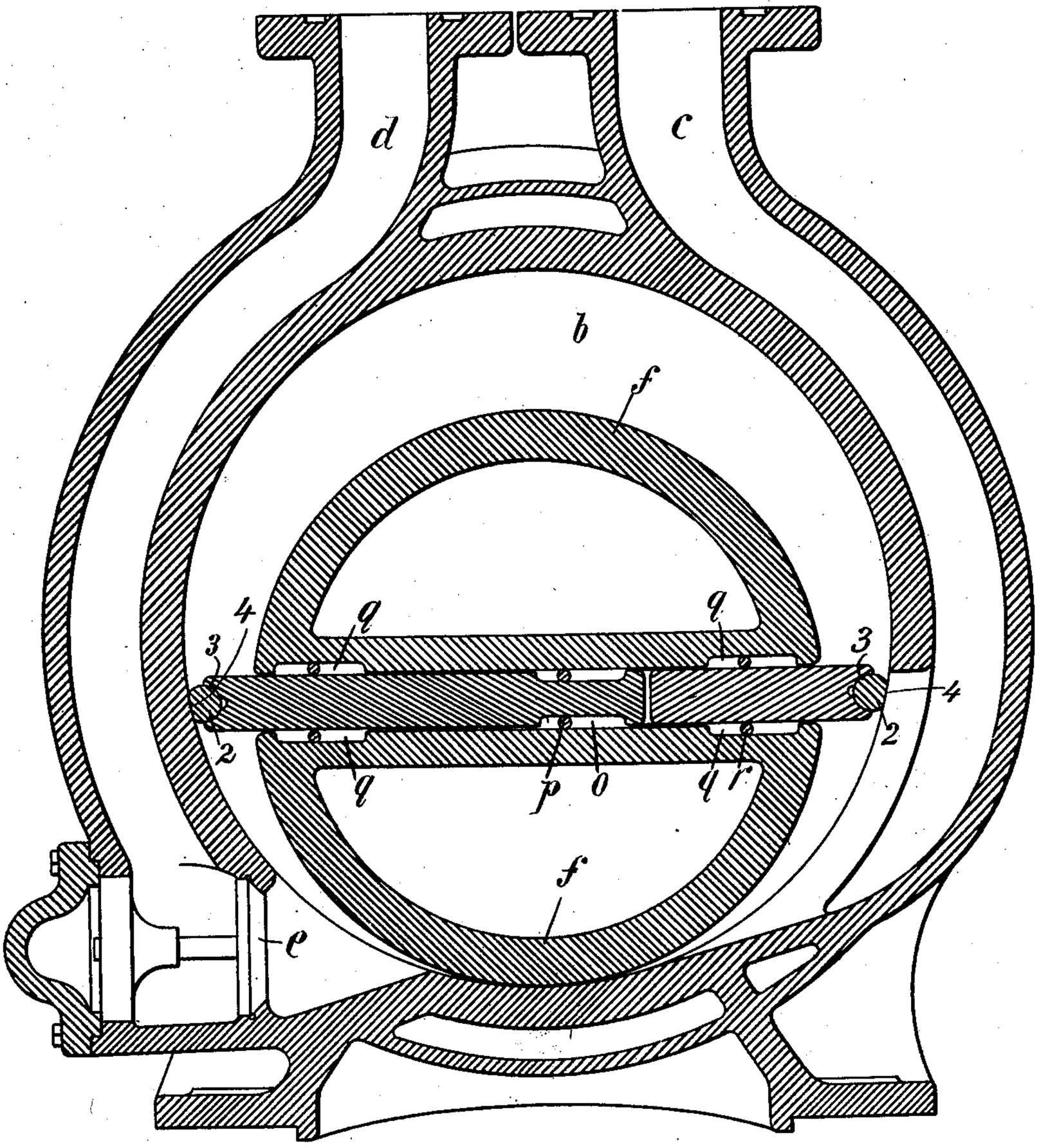
3 SHEETS—SHEET 2.

FIG. 2.



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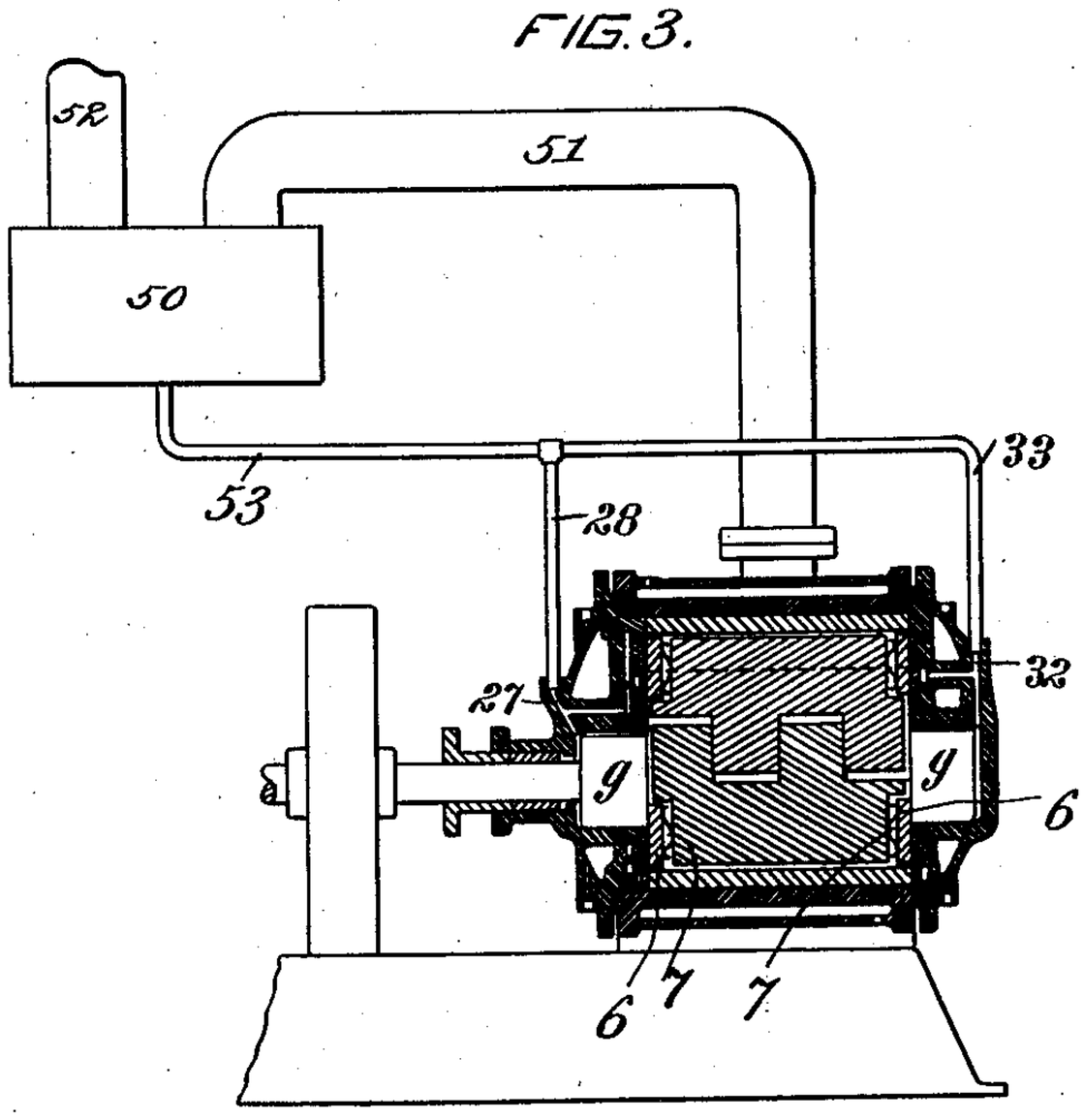
3 SHEETS—SHEET 3.

FIG. 3.



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UNITED STATES PATENT OFFICE.

CARL WILHELM VOLLMANN, OF MONTREAL, QUEBEC, CANADA.

ROTARY PUMP.

944,708. Specification of Letters Patent. Patented Dec. 28, 1909.

Application filed April 18, 1904. Serial No. 203,692.

To all whom it may concern:

Be it known that I, CARL WILHELM VOLLMANN, of the city of Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements in Rotary Pumps; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates particularly to rotary compressing or pumping engines of the type in which sliding blades are utilized, and it has for its object to improve the packing and lubrication thereof.

The invention may be said briefly to consist of a particular construction of an antifriction packing together with a lubricating system used in conjunction therewith. For full comprehension, however, of my invention reference must be had to the accompanying drawings forming a part of this specification wherein like symbols indicate corresponding parts and in which,

Figure 1 is a longitudinal vertical sectional view of a rotary pumping engine provided with my invention; Fig. 2 is a transverse vertical sectional view thereof; and Fig. 3 is a diagrammatical view illustrating the connection of my improved lubricating means to the delivery end of a compressor.

The cylinder is indicated at *b* and has suction and delivery ports *c* and *d* respectively and a check valve *e* separating the interior of the cylinder from the delivery port, while a hub *f* which carries the blades is provided with trunnions *g* supported in bearing caps *h h'* constituting cylinder heads. All of these parts are, in the main, of the construction usually employed in this type of engine, and they will not, therefore be described in detail, but the location of the check valve in a rotary compressing engine, is a feature of the invention.

In order to reduce the friction between the radially outer edge of each blade and the interior of the cylinder wall I insert in a recess 2 in such edge a round bar 3 having one side sheared off as at 4 on a curved line concentric to said cylinder wall and its ends transversely recessed as at 5. This bar also serves as a packing, and the side edges of the blades, toward the cylinder heads are provided with packing, 6, bearing yieldingly toward the said cylinder heads under the influence of bow springs 7. These packing strips have their ends nearest the cylindrical wall diminished and extended a short distance beyond the end of the blades as at 8 to bear in the recessed ends of the bars 3.

A tight joint is effected according to this invention between the side edges of the hub and the blades, and the inner faces of the cylinder heads by packing devices held in bearing relation with the side edges of said hub and blades under a pressure proportional to the pressure of the motive fluid the leakage whereof it is desired to prevent. To this end I form the cylinder of slightly greater length than the hub and blades and place a packing disk 10 between one end of these parts and the adjacent cylinder head. As an instance I show this disk between the hub and blades and the cylinder head *h*. This disk has an axially extending peripheral steadying flange 11 which encircles and is steadied upon an annular shoulder 12 upon the inner side of cylinder head *h* and formed by inwardly increasing the thickness of the middle portion of such head. When it is necessary to prevent the leakage of a fluid being acted upon of abnormally high penetrative power, or a motive fluid of abnormally high pressure, the disk is annularly recessed, as at 15, concentric to and in line with the periphery of the hub, and a ring 16 is comparatively loosely set therein, while the opposite cylinder head, *h'*, is correspondingly recessed as at 17 and has a ring 18 similarly set therein.

In order to maintain the disk and the rings 16 and 18 in bearing relation with the blades and hub, and charge the bearings with a lubricant, all under a pressure commensurate with that of the fluid within the cylinder, I form a rigid collar 20 upon the disk thus establishing a space 21 between the latter and cylinder head *h* while I construct the cylinder heads *h* and *h'* of such depth as to provide shallow spaces 22 and 23 at the outside ends of the trunnions *g*. The recess 15 is made to communicate with the space 21 by a duct 25, and such space is in turn, made to communicate with the top of a pressure chamber or reservoir 50, containing the lubricant and to which the delivery pipe 51 from the compressor leads and from which the lubricant is taken by pipe 53 while a pipe 52 conducts the discharged compressed fluid from the chamber or reservoir to any desired point of distribution or consumption. A branch 28 leads from this pipe 53 to a duct 27 formed in the frame of the com-

pressor and having a series of branches one of which communicates with the space 22 another, 26, communicates with the space 21 and if applied to a rotary engine, the pipe 51 will be connected to the steam chest thereof or other point of supply. The recess 17 and space 23 are connected to the source of pressure by branch ducts 30 and 31 of a main duct 32 and a pipe 33, the latter constituting a branch of the pipe 53 while each of the spaces 22 and 23 are caused to communicate with and lubricate the contact faces of the blades, the packing strips and bars, and the disk, by axial channels 34 in the perimeter of the trunnions *g*.

It is obvious that an engine, whether a pumping engine or other type, provided with my invention will have its parts thoroughly lubricated, and that the lubricant employed will be held constantly upon the said parts by a pressure commensurate with the pressure under which the engine works.

I do not claim the specific construction of the blades disclosed as the same forms the subject matter of an application filed by me on July 8, 1904, under No. 215,819 and is a divisional part hereof.

What I claim is as follows:—

1. The combination with a cylinder, and a revoluble piston therein of a packing member effecting a tight joint between one side of the piston and the wall of the cylinder, and means whereby a lubricant in a fluid state and under pressure maintains the packing member in bearing position.

2. The combination with a cylinder, and a revoluble piston therein, of a packing disk carried by the cylinder and effecting a tight joint between one side of the piston and the wall of the cylinder and means whereby a lubricant in a fluid state and under pressure maintains the packing disk in bearing relation with one side of the said piston.

3. The combination with a cylinder, and a revoluble piston therein, of a packing disk carried by the cylinder and effecting a tight joint between one side of the piston and the wall of the cylinder, such disk being located a short distance from one end of the cylinder, a chamber constructed to contain a lubricant, a conductor communicating with the cylinder and adapted to conduct a high pressure fluid, the chamber communicating with the conductor, and a communicating duct adapted to conduct a high pressure fluid and leading from the chamber to the space between the disk and the adjacent end of the cylinder.

4. A rotary engine comprising a cylinder. cylinder heads closing the ends of said cylinder and having bearings formed in one therewith, a rotary hub within the cylinder and having trunnions projecting into such bearings, the trunnions having axial grooves in the perimeters thereof and being sufficiently less in length than the bearings to provide spaces at the ends thereof, and means for supplying oil under pressure to such spaces, for the purpose set forth.

In testimony whereof, I have affixed my signature, in presence of two witnesses.

CARL WILHELM VOLLMANN.

Witnesses:
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