FIP7905 OR 436,567

(No Model.) 2 Sheets—Sheet 1.

G. H. REYNOLDS.

RADIAL CYLINDER PUMP.

No. 436,567. Patented Sept. 16, 1890.

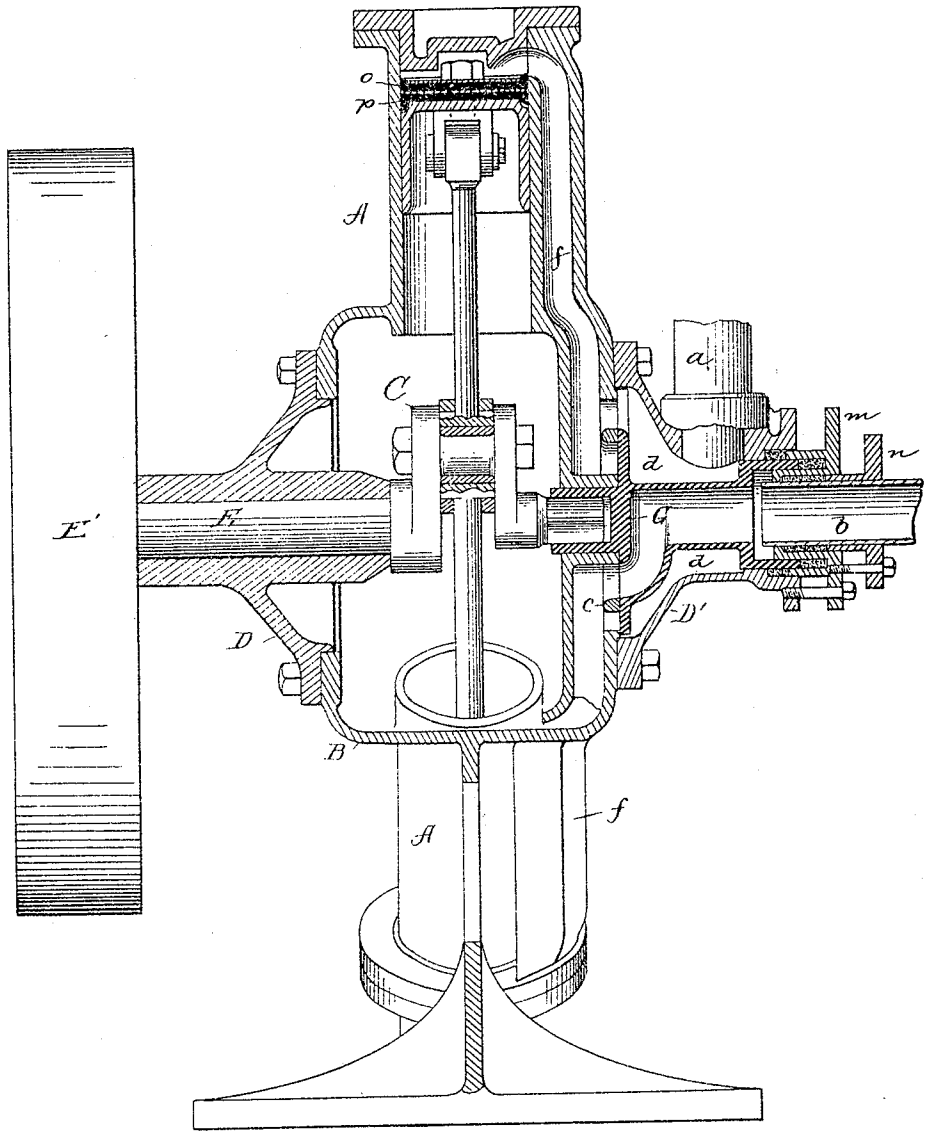


Fig. 1.

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103. PUMPS.

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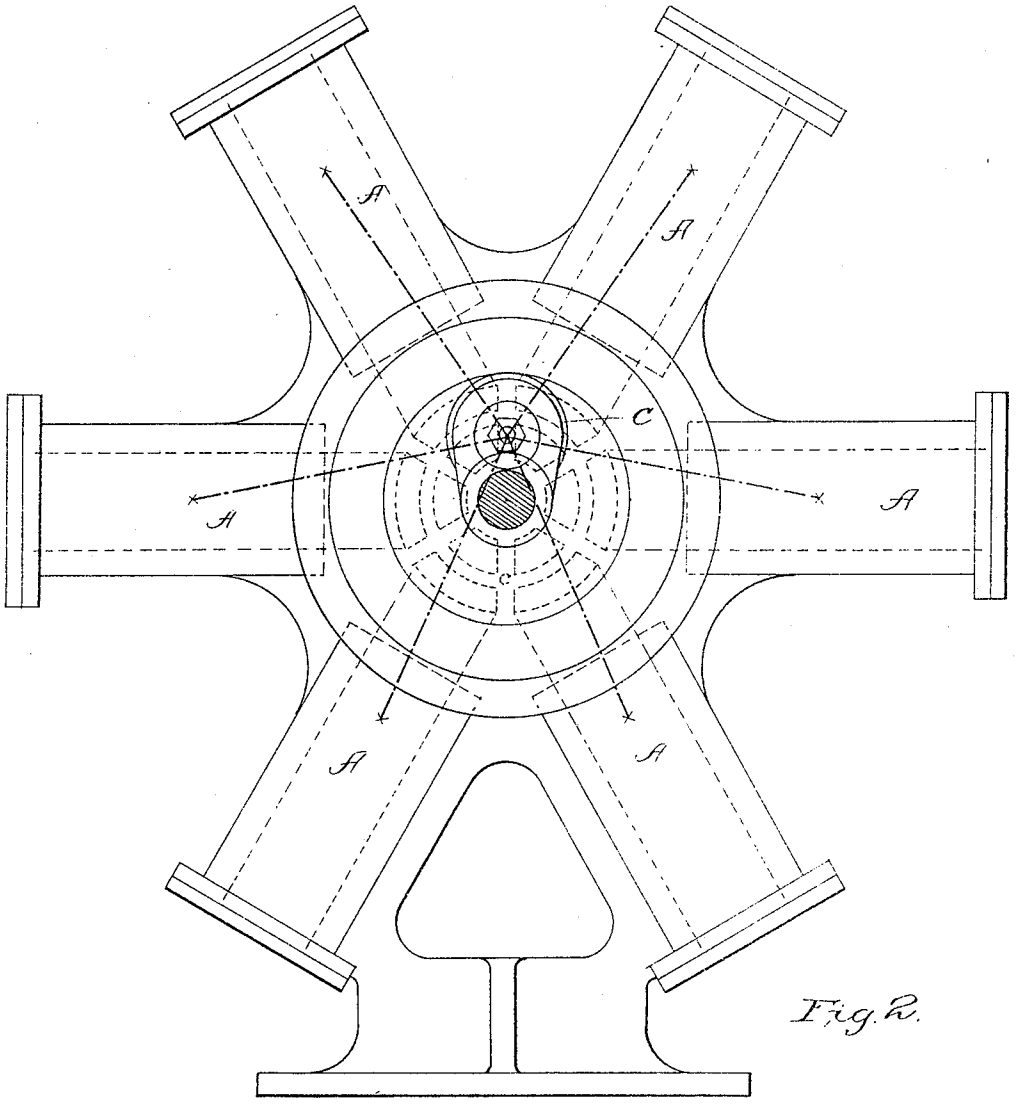


Fig. 2.

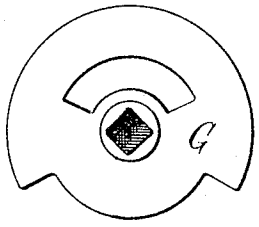


Fig. 3.

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UNITED STATES PATENT OFFICE.

GEORGE H. REYNOLDS, OF NEW YORK, N. Y., ASSIGNOR TO HENRY B. RICHARDSON AND EDWARD B. MARSH, OF AMHERST, MASSACHUSETTS.

RADIAL-CYLINDER PUMP.

SPECIFICATION forming part of Letters Patent No. 436,567, dated September 16, 1890.

Application filed March 26, 1888. Renewed March 11, 1890. Serial No. 343,548. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. REYNOLDS, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Radial-Cylinder Pumps; and I do hereby declare that the following is a full, clear, and exact description of my invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has reference to improvements in radial-cylinder pumps; and it consists in certain details of construction and combinations of parts, as will be hereinafter more fully set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents a sectional view of the pump, some parts being shown in elevation. Fig. 2 is a side elevation without detail, showing the arrangement of the cylinders and the ports (in dotted lines) through which the fluid has ingress and egress to the several pump-cylinders. Fig. 3 is a face view of the valve, showing the socket for the driving-shaft.

I have shown six radial cylinders A A, &c., cast with the pump-frame B. A space is left at the center of the frame to accommodate the crank C and the piston-rods connected therewith. This space is inclosed on one side by the frame D, and the opposite side is covered by a perforated wall *c*, forming part of the main frame, as shown in dotted lines in Fig. 2, the perforations being portions of the passages which lead to the different cylinders. This wall is covered by a frame D′. In the part D′ a water-chamber *d* is formed, and the inlet and exhaust conduits *a b*, respectively, are fitted. The frame D is made somewhat heavier, and forms the bearing of the driving-shaft E, on which the driving-pulley E′ is mounted. The water-passages *f* lead from the center to the outer end of the cylinders, and are cored out of enlargements of the casting on the outside of each cylinder. Each of these passages communicates with two perforations in the wall *c* of the frame. Through the outer perforation the incoming water passes to the cylinders, and through the inner perforation the outgoing water passes.

The valve itself is represented by the letter G. It is provided with a square socket centrally located on one face, into which the squared end of the driving-shaft fits. The valve has two bearings, one in a journal surrounding the squared socket and the other at the outer end of the frame D′. The construction of the valve is such that the exhausted fluid passes directly through it to the exhaust-conduit *b*, while the incoming water occupies the chamber around the outside of the valve. The surfaces of the valve exposed to the pressure of water are regulated so that the forces will balance each other and not cause the valve to bind when rotating.

At the point where the exhaust-conduit connects with the pump is placed a novel form of stuffing-box. It consists of two parts *m* and *n*, one of which *m* is provided with two flanges or sleeves, which press upon the packing on the inside and outside of the valve. The part *n* secures packing between the part *m* and the water-conduit. *m* is bolted to the end of the pump-frame, and *n* is similarly secured to *m*. This construction forms an effectual stuffing-box.

The pistons are packed with two layers of packing *o* and *p*, clamped together by means of plates and a bolt, as shown. The edges of the two layers of packing are turned outward in opposite directions, so that the packing will be effectual during both movements of the piston. When the cylinder is sucking, the lower layer does the better work, and while the piston is forcing the fluid out the upper layer is most effectual. The bolt which secures these parts of the piston also holds the clip in which the piston-rod is pivoted.

The pump operates as follows: Power applied to the pulley to turn the crank causes the pistons to successively reciprocate in their respective cylinders. The valve is adjusted so that an open passage is presented between chamber *d* and the passage leading to the cylinder, and when a piston recedes the water rushes in to fill the cylinder. With the revolution of the crank the valve is turned, so

that by the time the pistons begin their return-stroke to force the water out the valve has turned so that the exhaust-passage is open to allow the water to pass out. With a pump of six cylinders, three of them are always forcing the water out, while the other three are sucking it in, and they all act consecutively.

Having described my invention, I claim—

1. In a radial-cylinder pump, the combination, with the exhaust-pipe, of a valve the tubular stem of which embraces the end of the exhaust-pipe, a casing for said valve provided with an annular recess containing packing surrounding the valve-stem, a gland consisting of a disk having two annular flanges, one of which fits between the exhaust-pipe and valve-stem and the other one of which fits outside the valve-stem in the packing-recess of the casing, and packing between the two flanges, substantially as described.

2. In a radial-cylinder pump, the combination, with the exhaust-pipe, of a valve the tubular stem of which embraces the end of the exhaust-pipe, a casing for said valve provided with an annular recess containing packing surrounding the valve-stem, a gland consisting of a disk having two annular flanges, one of which fits between the exhaust-pipe and valve-stem and is provided with an internal recess containing packing, and the other one of which fits outside the valve-stem in the packing-recess of the casing, packing between the two flanges, and a second gland fitting about the exhaust-pipe and in the recess in the inner flange of the first gland, as described.

In witness whereof I have hereunto affixed my name in the presence of two subscribing witnesses.

GEO. H. REYNOLDS.

Witnesses:
WM. A. ROSENBAUM,
FRANK. C. GRUER.