(No Model.) 2 Sheets—Sheet 1.

G. P. FISCHER.

ROTARY ENGINE.

No. 566,156. Patented Aug. 18, 1896.

Fig. 1

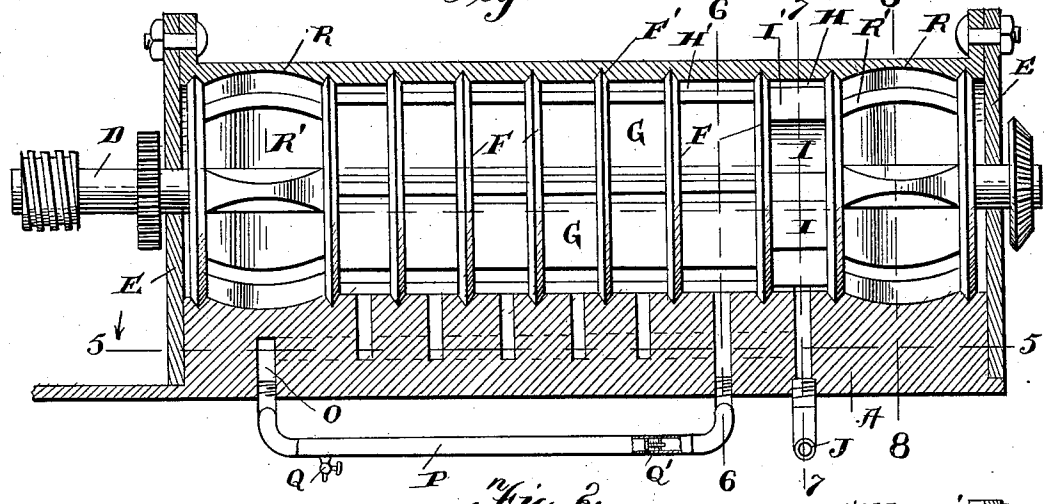


Fig. 2.

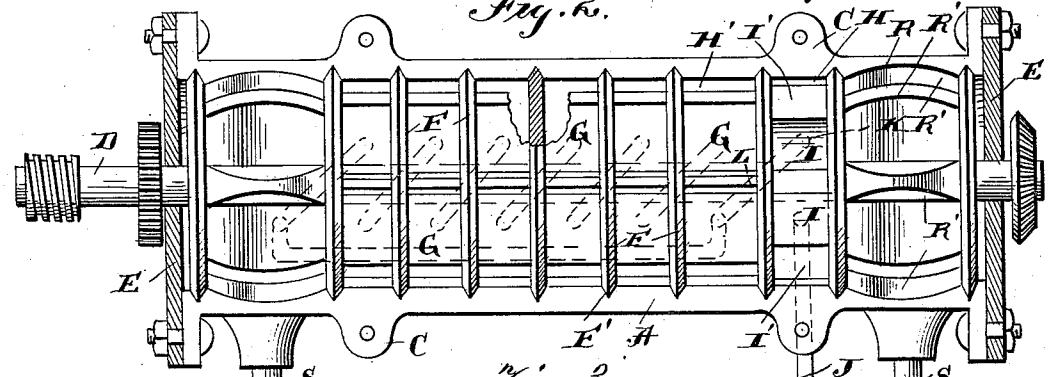
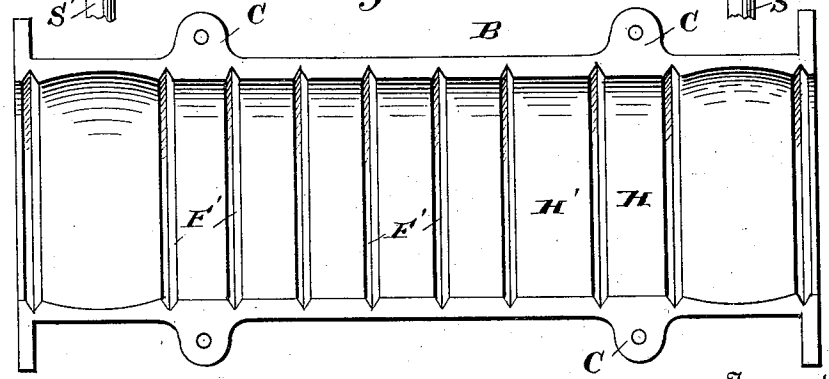


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

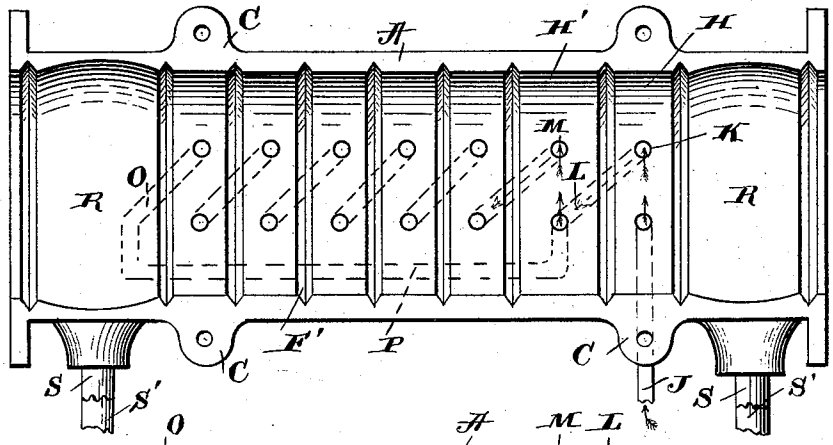


Fig. 5.

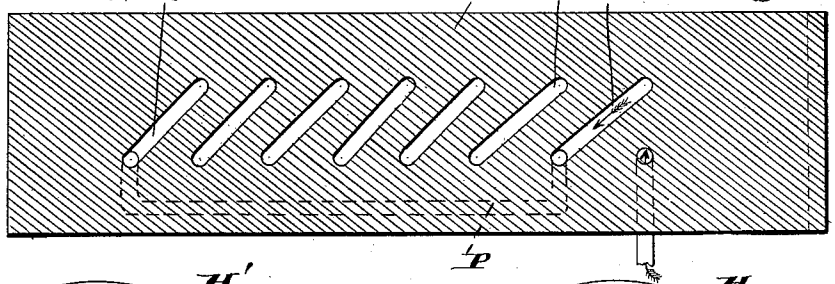


Fig. 6.

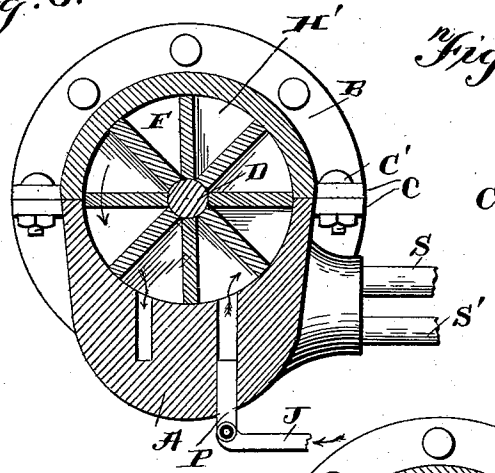


Fig. 7.

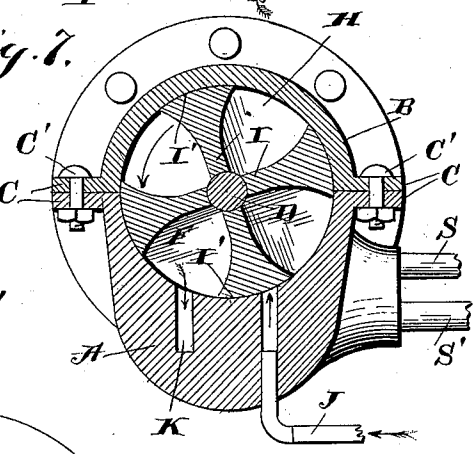
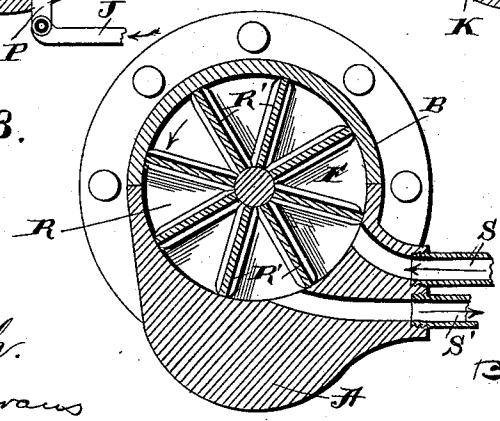


Fig. 8.



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UNITED STATES PATENT OFFICE.

GEORGE P. FISCHER, OF SHERIDANVILLE, PENNSYLVANIA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 566,156, dated August 18, 1896.

Application filed May 9, 1896. Serial No. 590,875. (No model.)

To all whom it may concern:

Be it known that I, GEORGE P. FISCHER, of Sheridanville, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Rotary Engines and Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

This invention pertains to rotary engines and pumps; and the object thereof is to provide an engine of improved form provided with a rotary piston having arranged thereon a succession of steam-chambers having blades upon which the steam acts in rotating the piston, the steam being led from one pocket to another by suitably-arranged channels in the base of the engine.

A further object is to provide a return-pipe from the end or last chamber to the beginning of the series, whereby steam may be returned and caused to pass through the rotary piston again, the operation being continued until the force of the steam is exhausted.

The invention consists in the novel features of construction hereinafter fully described and claimed, and illustrated by the accompanying drawings, in which—

Figure 1 is a vertical longitudinal sectional view of the engine and pump, the piston being shown in elevation. Fig. 2 is a plan view with the upper portion of the casing removed. Fig. 3 is an inverted plan view of the upper portion of the casing. Fig. 4 is a plan view of the lower section of the casing with the piston removed. Fig. 5 is a horizontal sectional view on line 5 5 of Fig. 1. Figs. 6, 7, and 8 are vertical sectional views on lines 6 6, 7 7, and 8 8, respectively, of Fig. 1.

A designates the lower portion of the casing, which constitutes the base of the engine and pump, and B the upper removable portion of the casing, said casing-sections having the projecting perforated lugs C, through which uniting-bolt C′ extends. The interior of the combined sections is formed into a longitudinal cylindrical cavity, through which the piston-shaft D extends, said shaft having its bearing in the end plates E of the structure. Arranged at intervals upon the shaft are the disks F, formed with tapered or wedge-shaped peripheries, which take in similarly-formed grooves F′ of the casing, and by this means separated pockets or chambers are provided. Each chamber is divided into a series of pockets by the radial blades G. In chamber H, in which the live steam is first introduced, the blades I, which constitute the pockets, are enlarged at their outer ends and rounded, as indicated at I′. The steam is introduced from the boiler into chamber H through pipe J. The piston is thus caused to rotate in the direction indicated by the arrow in Fig. 7 and is discharged through port K, the inlet pipe or port being closed by the enlarged end I′ of one of blades I while the discharge is taking place. Port K communicates with the cross-passage L, which discharges the steam into the chamber next adjacent, and the steam acts upon the blade of the piston in this chamber, assisting in the rotary movement of the piston and finally discharging through port M into the next cross slot or passage, through which it is led to the next adjacent chamber, and the operation is repeated until the steam has passed through all the chambers of the series, as will be understood. When the steam reaches the end cross-passage O, it is discharged into pipe P, provided with exhaust-valve Q, which may be partially open to permit of part of the steam escaping, while the remainder will be conducted back and introduced into chamber H′ adjacent the initial chamber H. It will there join the onward-flowing live steam and again traverse the engine, repeating the first operation. This may be continued as many times as the life of the steam will permit.

If the engine is used for driving light machinery where comparatively small force is required, the escape or exhaust valve may be almost entirely closed, and thus cause the steam to traverse the engine a number of times, while if heavy work is in progress the valve may be entirely opened and all the steam permitted to exhaust after having once passed through the engine.

The inlet-port of chamber H will be closed when the return-steam forces through pipe P past the check-valve Q′ therein and into the

chamber H′. Said check-valve will prevent the passage of steam through the pipe in the wrong direction.

The end chambers R are arranged for the rotary pumps, the same being considerably wider than the chambers of the engine, and arranged therein are the radial blades R′. The inlets S and outlets S′ for the pump are arranged adjacent each other, as shown, so as to impart as much force to the water in passing through the pump as possible. The water-chambers will tend to keep the shaft-bearings cool in the end plate of the structure, which, owing to the very rapid rotation of the piston, would otherwise have a decided tendency to burn out.

The axial shaft of the piston may be projected at each end and provided with either pinions or worm-gears, as may be desired.

The combined engine and pump herein shown and described is particularly adapted as a fire-engine, for the rotation of the piston is exceedingly rapid and great force will be imparted to the water by the rotary pump. It is not my desire, however, to limit its use to pumping water, for the same may be used as a device for circulating air, the rotary pump acting as well for forcing air as for water. The engine may also be used for various purposes regardless of the pump feature, as will be readily understood.

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

1. The combination of a casing having a cylindrical bore, an axial shaft extended longitudinally therethrough, a succession of separated disks arranged upon the shaft and fitting within the casing, thereby forming a succession of chambers, the blades arranged radially from the shaft within the chambers to form pockets, each chamber being provided with an inlet and outlet port, a connection between each outlet-port and the inlet-port of the chamber next adjacent, a steam-supply for the first chamber of the series, a steam-exhaust for the last chamber, and a connection between the exhaust-port of the last chamber of the series and the inlet-port of one of the first chambers of the series, the operation being substantially as herein shown and described.

2. The combination of the casing having a cylindrical bore, the axial shaft extending longitudinally therethrough, the separated disks arranged on the shaft and fitting within the bore to form a succession of steam-chambers, the blades within the chambers dividing the same into pockets, the blades in the first chamber of the series being enlarged at their outer edges for the purpose stated, each chamber having an inlet and outlet port, the outlet-port of each chamber being connected with the inlet-port of the chamber next adjacent for the purpose stated, a steam-supply for the first or initial chamber, and an exhaust for the last chamber of the series, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE P. FISCHER.

Witnesses:
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DAVID E. MOORE.