

J. A. Talpey.

Rotary-Pump.

Patented Mar. 24, 1868

Nº 75811

FIG. 1.

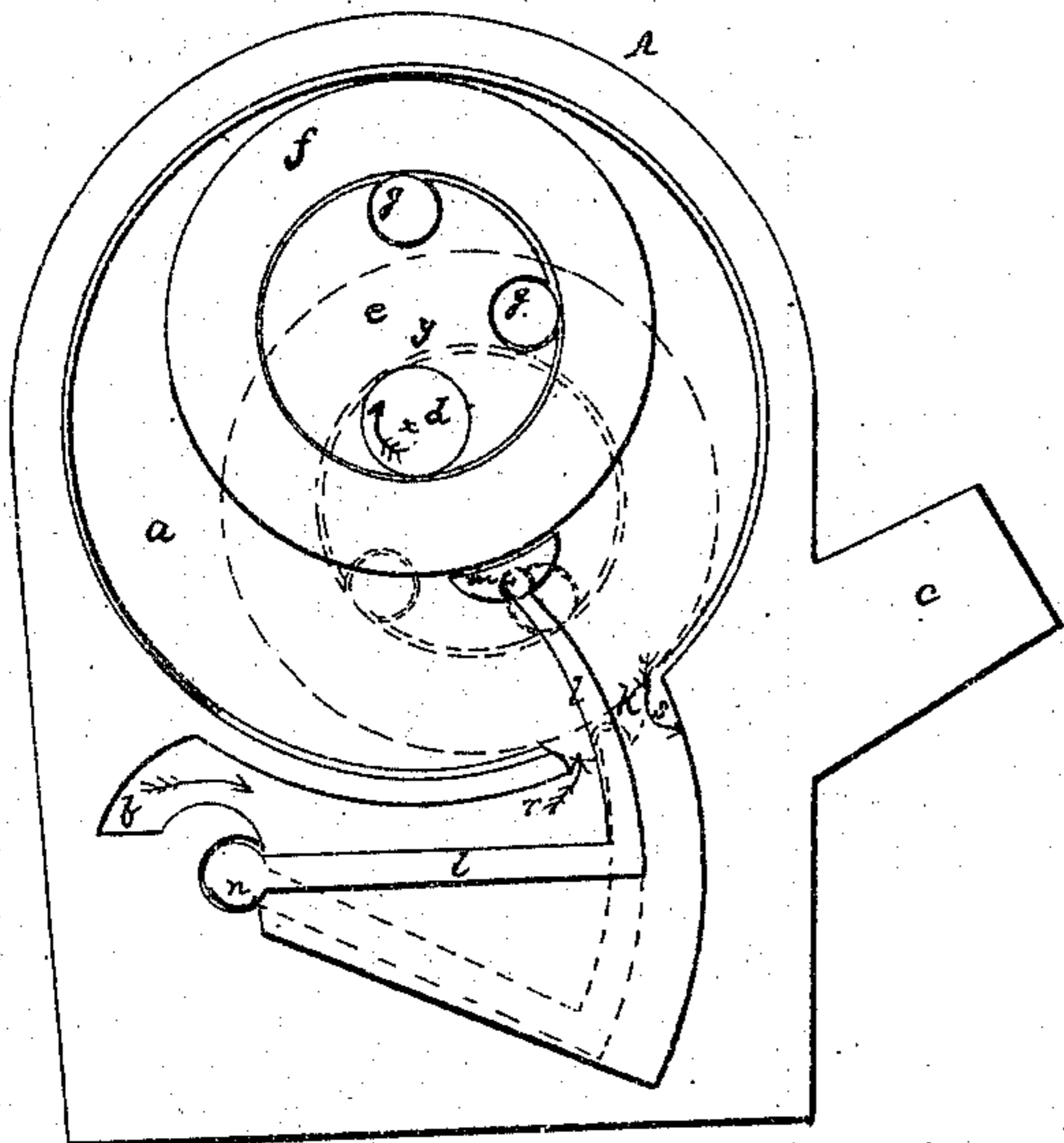


FIG. 2.

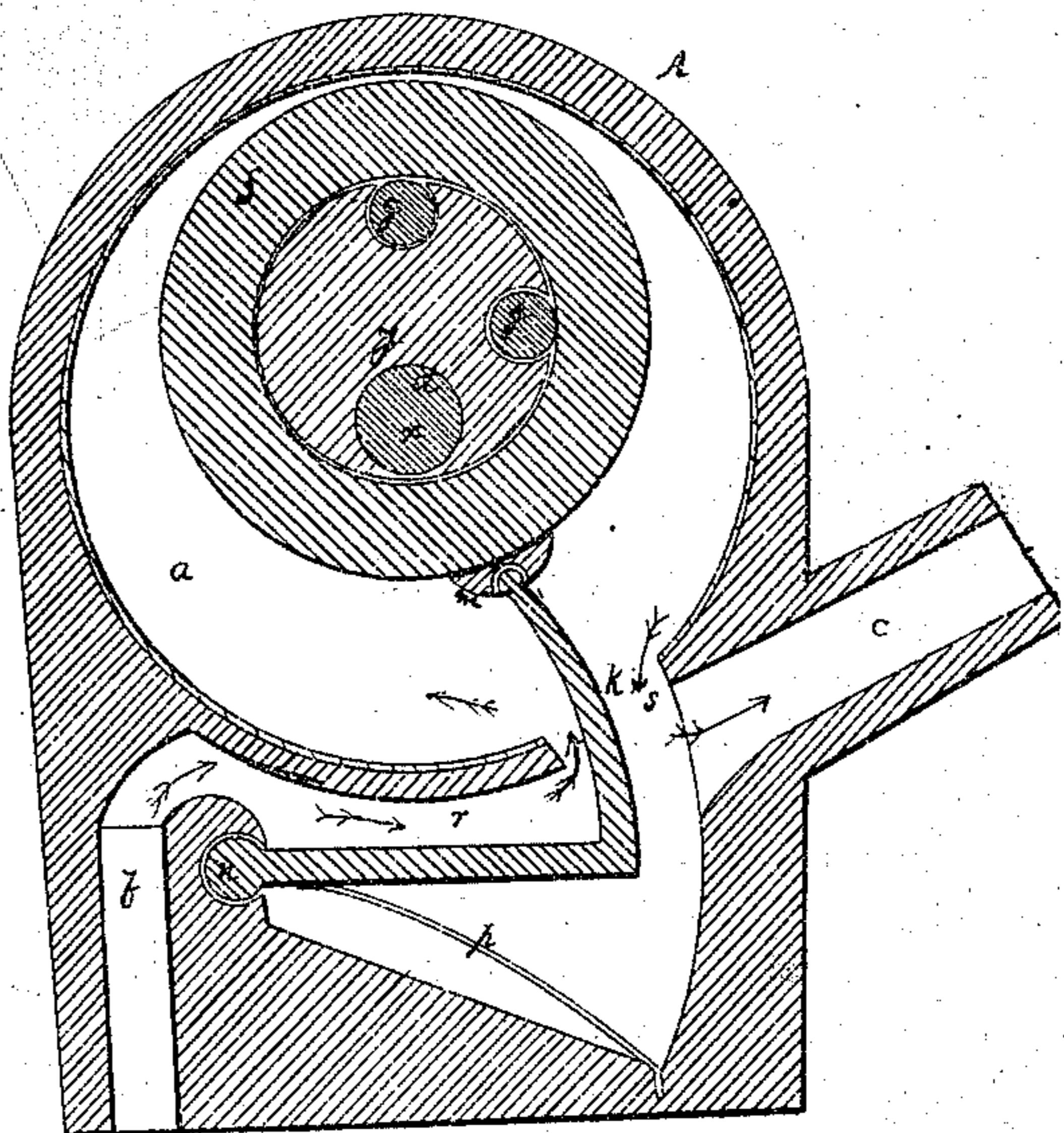
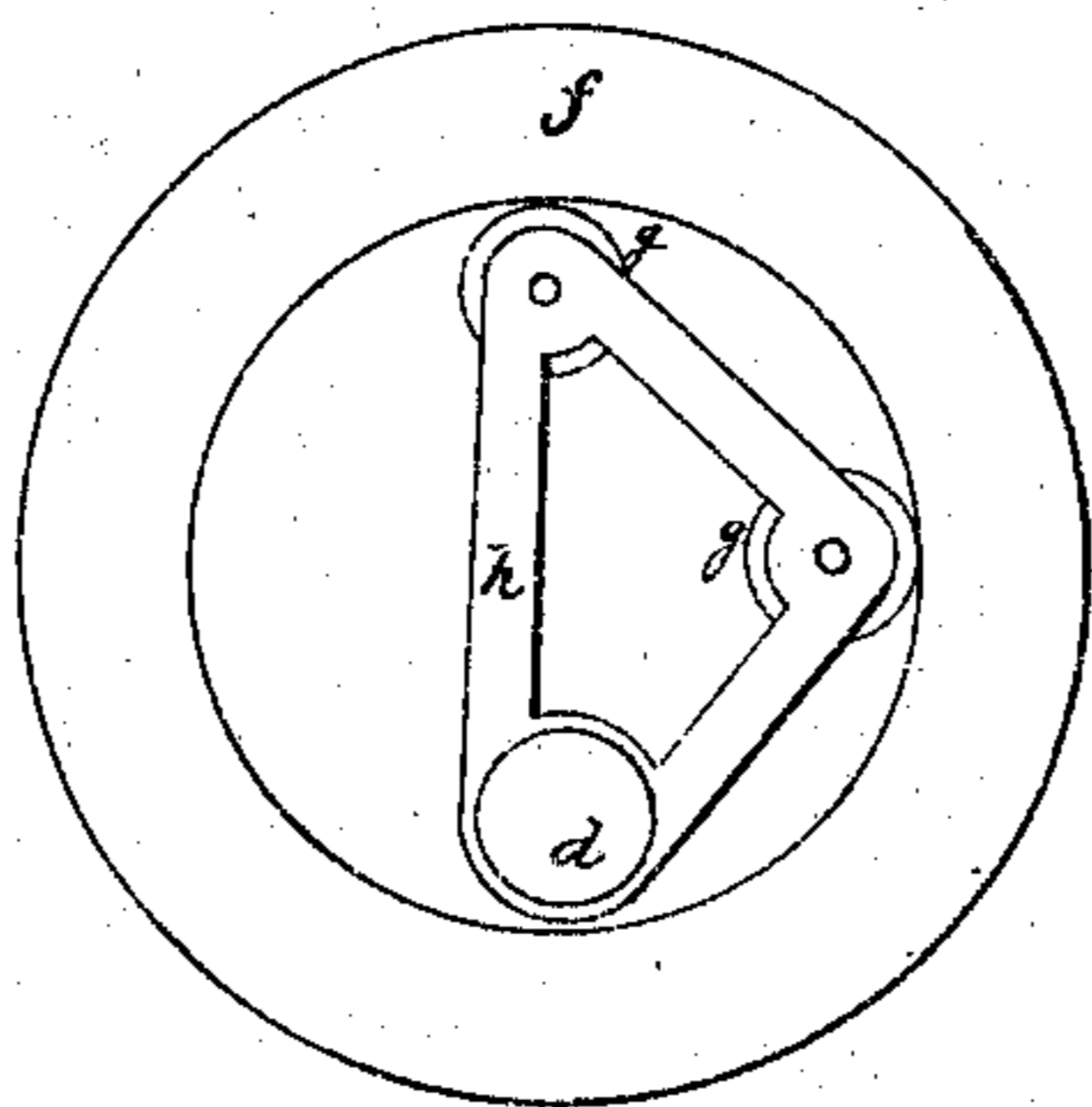


FIG. 3.



Witnesses:

W. Darby
Chas. B. Page Jr.

Inventor:

Joseph A. Talpey
by his attorney
A. Bell

United States Patent Office.

JOSEPH A. TALPEY, OF SOMERVILLE, ASSIGNOR TO HIMSELF AND MELLEN BRAY, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 75,811, dated March 24, 1868.

IMPROVEMENT IN ROTARY PUMPS.

The Schedule referred to in these Letters Patent and making part of the same.

TO WHOM IT MAY CONCERN:

Be it known that I, JOSEPH A. TALPEY, of Somerville, in the county of Middlesex, and State of Massachusetts, have invented certain new and useful Improvements in Rotary Pumps; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a pump constructed in accordance with my invention, the side of the pump-case being removed so as to show the arrangement of the interior mechanism.

Figure 2 is a longitudinal vertical section through the centre of the pump.

Figure 3 represents a modified form of the cam or eccentric for operating the piston-ring.

In rotary pumps, of ordinary construction, the combination and arrangement of the pistons and other necessary operative parts, are such as to unavoidably subject such parts to excessive and continuous friction during the time the pump is in operation. The effect of this continuous attrition is to destroy in a comparatively short time the efficacy of the working parts of the pump, the wear and tear upon them being such as to require their frequent repair and renewal, which not only is productive of much delay, but gives rise to an expenditure of labor and money, which, were the pump otherwise constructed, might easily be avoided.

The object of my invention is to produce a pump in which the operative parts, while arranged to obtain the best results, shall be both simply constructed, and disposed within the pump-case so as to almost entirely avoid all friction, especially between the piston and the pump-case, where it is productive of the greatest disadvantages.

To enable those skilled in the art to understand and use my invention, I will now proceed to describe the manner in which the same is or may be carried into effect by reference to the drawings accompanying and forming part of this specification.

The pump-case A is provided with a cylindrical compartment, *a*, for the reception of the piston, and with admission and discharge-pipes or orifices, *b c*. Within the cylinder *a* is a shaft, *d*, the ends of which are mounted centrally in the ends of the cylinder, so that the shaft shall revolve upon the axis of the cylinder. One end of the shaft projects from the case, and has mounted upon it a crank or pulley, to which power may be applied from some suitable motor so as to cause the revolution of the shaft. A disk, *e*, is mounted eccentrically upon the shaft *d*, the two being cast in one piece, if desired, and around this disk fits a piston-ring, *f*. The latter is placed loosely upon the disk, being entirely disconnected therewith, and is so arranged that that portion of it furthest removed from the shaft *d*, or, in other words, the axis of the cylinder, shall be in contact with the contiguous portion of the surface of the cylinder.

When the shaft *d* revolves, the cam or disk *e* moves with it, and carries around the piston-ring *f*, which thus gradually passes over the surface of the cylinder. If the disk and piston-ring were rigidly connected, it will readily be seen that the latter would be dragged around over the interior surface of the cylinder, the same portion of the piston being in contact with the cylinder at all times, thus inducing a friction, which would cause the piston as well as the cylinder to become rapidly worn away and unfitted for use. This defect, however, is entirely obviated by the arrangement of parts shown in the drawings. As the piston-ring is mounted loosely upon the disk, and is free to revolve upon its own axis, the resistance which is induced by contact between the cylinder and itself, as it moves in its circular path, following the interior surface of the cylinder, will cause it to rotate upon its own axis, thus enabling it to roll around the cylinder, and consequently to wholly prevent any attrition between the portions of the cylinder and piston which come in contact. The piston *f*, when being operated, has thus two motions, the one being its eccentric movement around the axis *x* of the cylinder, the other its rotary movement upon its own axis *y*.

In order to avoid friction between the disk *e* and piston-ring *f*, I mount friction-rolls *g*, in the former, at the points where the pressure of the disk upon the piston is greatest.

In fig. 3, I have shown a modified form of the cam for actuating the piston, consisting of a frame of cast iron or other suitable material, *h*, rigidly secured to the shaft *d*, and carrying friction-rolls, whose relative posi-

tion to the surrounding piston-ring is the same as shown in the other figures. Other modifications of this mechanism will readily suggest themselves to those skilled in the art to which this invention pertains.

The pump-cylinder is provided with but one opening, *k*, through which the water or other fluid is both admitted from the pipe *b* and discharged into the pipe *c*. In this opening there moves a bent arm, *l*, which carries upon its free end a valve, *m*. The other end of the arm is hinged to the pump-case at *n*, as shown in the drawings. That part of the arm which extends up through the opening *k*, is curved, forming the arc of a circle, the centre of which is the point *n*, or thereabouts, so as to admit of the free play of the arm and the valve *m*. The valve is shaped so as to fit closely to the piston *f*, and is hinged to the arm *l*, as shown in the drawings, so that it may adapt itself to the movement of the piston. It is needless to say that both the piston *f*, arm *l*, and valve *m*, fit tightly against the ends of the pump-case, a suitable packing being employed for this purpose, if necessary. Under this arrangement it will be seen that the arm and its valves divide the opening in the cylinder *a* into two passages—the one, *r*, through which the water passes from the induction-pipe *b* into the cylinder, the other, *s*, through which the water is discharged from the cylinder into the eduction-pipe *c*.

The pressure of the water within the pump will always suffice to hold the valve *m* at all times against the piston, so as to close all direct communication between the two passages *r* *s*, but, if desired, a spring, *p*, or other suitable means, may be employed to aid in effecting this result.

The operation of the pump is as follows: Let it be supposed the piston is in the position covering the opening *k*, shown in red lines in fig. 1. If now the shaft *d* be revolved in the direction indicated by the arrow, the piston will be gradually moved around the cylinder *a*, opening the passage *r*, through which the water will be drawn, as indicated by the arrows, into the cylinder. As the piston moves around the cylinder, the water will continue to be drawn in until one revolution has been completed, in which case the whole of the upper portion of the cylinder will be filled with the liquid. Now, as soon as the piston begins its second revolution, the passage *s* is opened, through which the water, by the action of the piston, is forced into and through the discharge-pipe *c* in a continuous stream. At the same time a fresh supply of the liquid is being drawn in again through the passage *r*, to be in its turn discharged through the passage *s*. In order to more effectually close all communication between the two chambers into which the pump is divided by the piston and arm and valve, a packing of leather or other suitable material may be applied to the inner surface of the cylinder and to the valve *m*.

Having now described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the cylinder of a rotary pump, of the eccentric-piston ring, its actuating-cam or eccentric, and the valve and valve-arm, for regulating the admission and discharge of the fluid into and from the said cylinder, in the manner and for the purposes herein shown and set forth.
2. The combination, with the pump-cylinder and eccentric-piston ring, of the valve and arm for holding the same in position, and the orifices or pipes for the induction and eduction of the fluid, arranged and operating substantially as herein shown and described.
3. The construction and arrangement, within the pump-case and cylinder, of the hinged valve and valve-arm, substantially as shown and described.

In testimony whereof, I have signed my name to this specification before two subscribing witnesses.

JOSEPH A. TALPEY.

Witnesses:

ISAIAH KNOWLES, Jr.,
JAS. B. BELL.