

J. BANKS.
ROTARY PUMP.

Fig. 1.

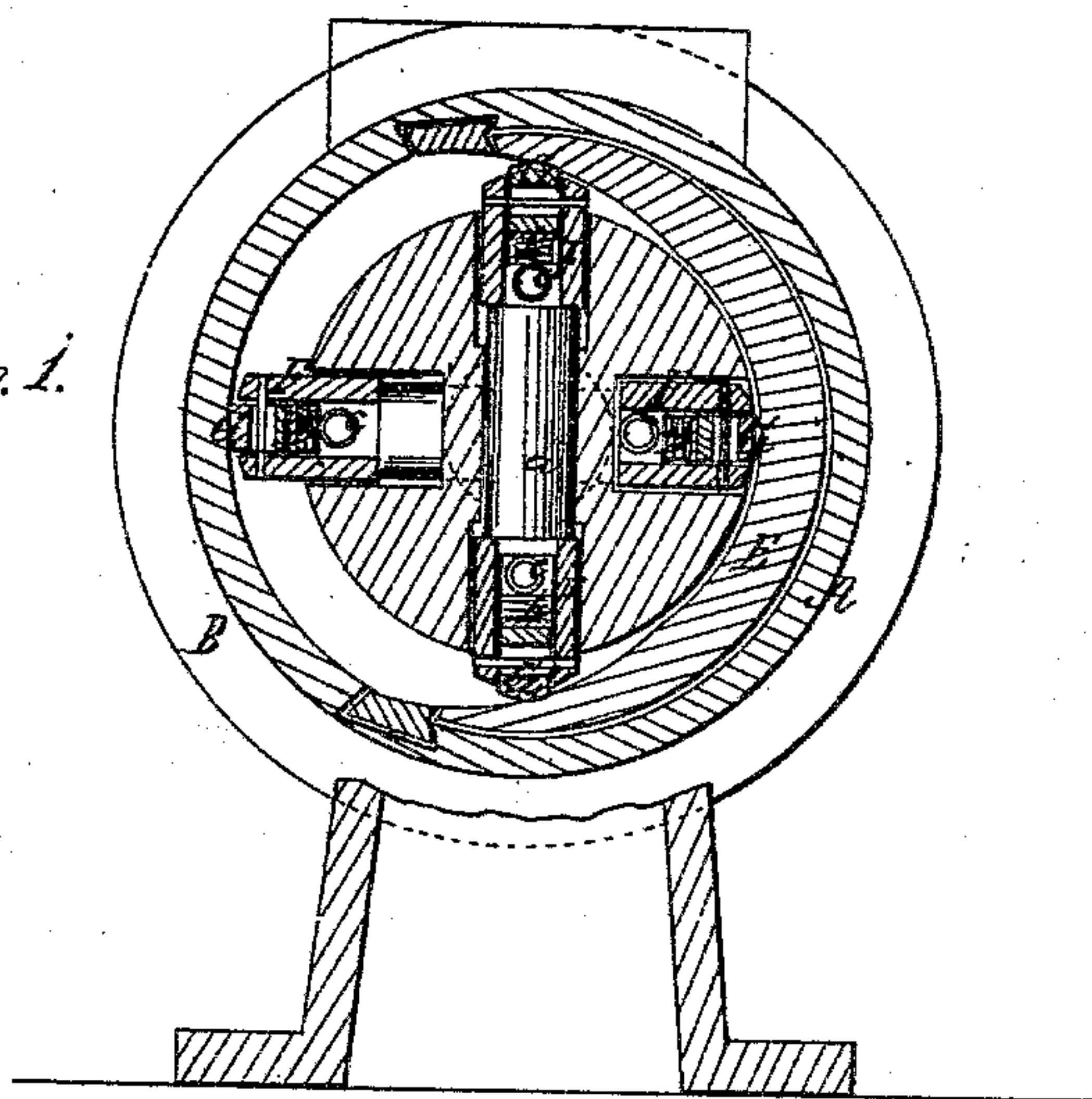


Fig. 2.

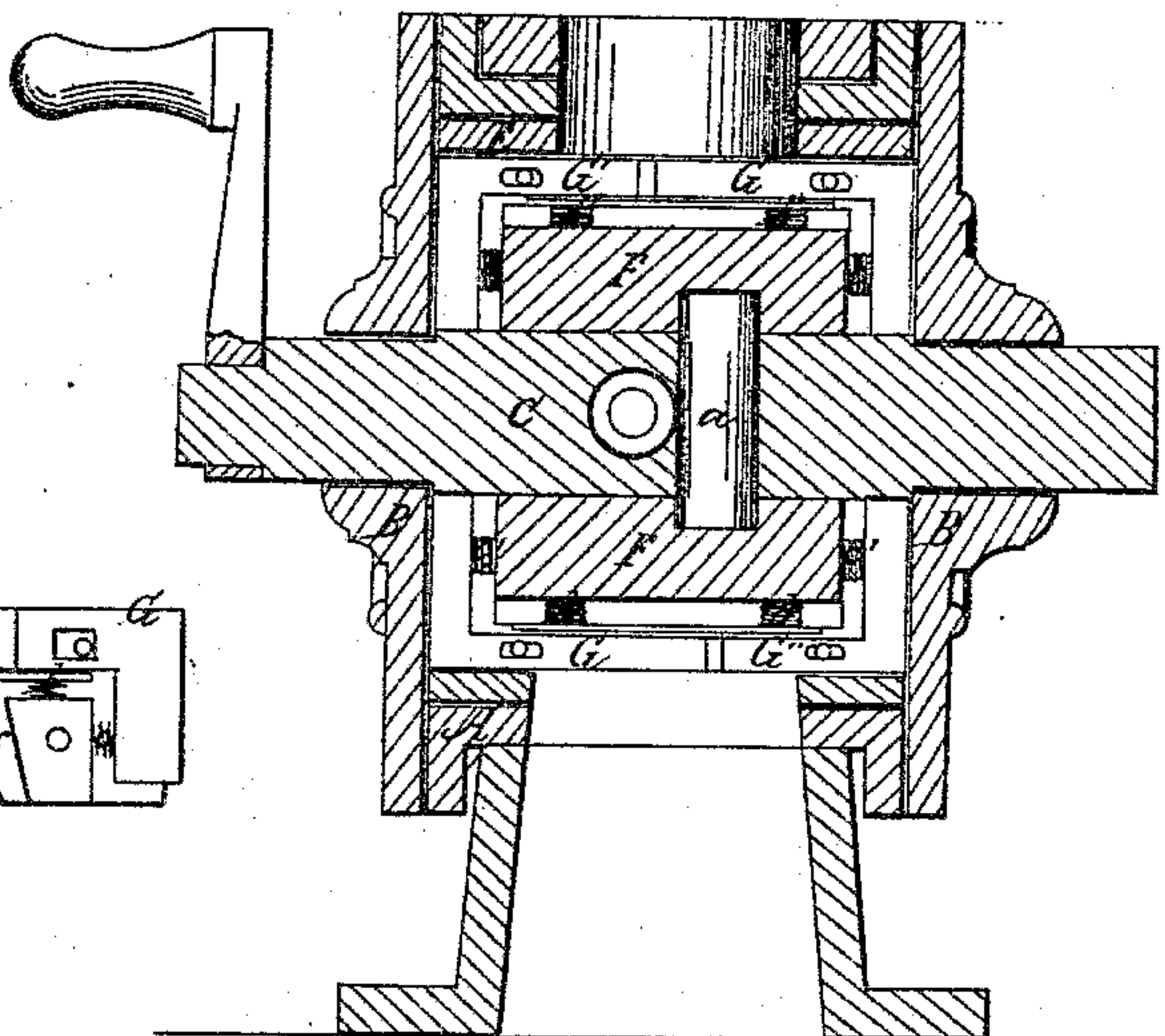
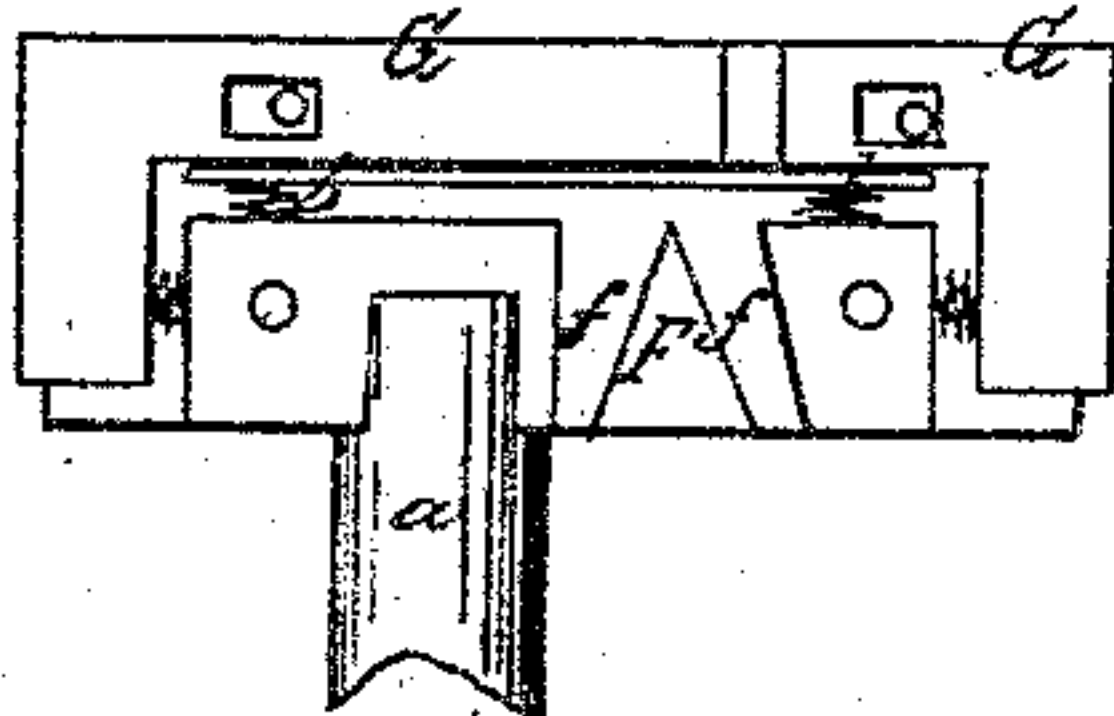


Fig. 3.



Witnesses;
Robt. Loudin
C. W. Reed

Fig. 4.



Inventor;
Joseph Banks

UNITED STATES PATENT OFFICE.

JOSEPH BANKS, OF NEW YORK, N. Y.

IMPROVEMENT IN ROTARY PUMPS.

Specification forming part of Letters Patent No. 39 540, dated August 18, 1863.

To all whom it may concern:

Be it known that I, JOSEPH BANKS, of the city, county, and State of New York, have invented a new and useful Improvement in Rotary Pumps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a transverse vertical section of my invention. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a front elevation of one of the pistons detached, the front plate having been removed to expose the working parts. Fig. 4 is a transverse vertical section of the same.

Similar letters of reference in the several figures indicate corresponding parts.

This invention relates to an improvement in that class of rotary pumps which I have described in Letters Patent granted to me September 23, 1862, and in which a piston-wheel with four sliding pistons revolves in an eccentric cylinder.

The object of my present improvement is to produce a tight joint between the edges and ends of the sliding pistons and the inner surface and heads of the cylinder by simple and easily adjustable means.

The cylinder A is made of cast-iron or any other suitable material, with two openings, *a* *b*, one to connect with the suction-pipe and the other with the ascension-pipe. The inner surface of this cylinder is bored out to a perfectly true circle, and the heads B, which are secured to the cylinder by means of screws or in any other desirable manner, are provided with central holes which form the bearings for the shaft C, to which the piston-wheel D is rigidly attached.

E is the inner case, which covers a little over one half of the inner surface of the cylinder, as clearly shown in Fig. 1 of the drawings. This case is so arranged that its thickest part touches the surface of the piston-wheel, and consequently an open crescent-shaped space is left between the surface of the piston-wheel and the inner surface of the cylinder opposite to the inner case and equal

to the thickness of said case. The piston-wheel is provided with four (more or less) sliding pistons, F, and instead of forcing these pistons out by means of springs interposed between them, as described in my former patent, I now connect the opposite pistons by stems *a*, so that the same are compelled to move simultaneously, one moving in when the other moves out, and vice versa. Each piston is provided with two spring-valves, G G', which are fitted into slots or grooves in the edges of said pistons. The two valves of each piston overlap each other, either in the center or toward one end of the piston, in order to clear the holes in the cylinder, and said valves are forced out by springs *b b' c c'* in a radial and in a lateral direction. By the action of the springs *b b'* the valves are forced out toward the inner surface of the cylinder, and by the springs *c c'* a tight joint is produced between the ends of the valves and the heads of the cylinder. By the action of the springs *b b'* the valves are continually held in contact with the inner circumference of the cylinder, notwithstanding the variations in its diameter, and by connecting the pistons they have a solid bearing throughout the whole stroke, so that they are not liable to bind even when exposed to a high pressure. Furthermore, by fitting the spring-valve into slots or grooves in the edges of the pistons they are securely guided and not liable to be forced off when subjected to a severe strain. If desired, the pistons can be made in two parts, a plate, *d*, being secured on one side by means of grooves *e*, as shown in Fig. 4 of the drawings. By this arrangement the introduction of the spring-valves is facilitated, and I am enabled to make that portion of the piston which is exposed to the most severe strain of steel, so as to make it last longer, and to be able to replace the same when worn out. The pistons may also be provided with channels *f* on their inner sides, through which the liquid in the cylinder is allowed to act on the inner edges of the spring-valve. In this case the liquid itself will keep the valves up tight to the cylinder with more or less force, according to its own pressure. By these means

the strain on the springs *b b' c c'* will be reduced and they will be less liable to wear out than without such liquid packing.

What I claim as new, and desire to secure by Letters Patent, is—

1. Arranging the valves *G G'* in slots or recesses in the edges of the pistons *F*, as and for the purpose shown and described.

2. The springs *b b'* under the valves *G G'*, when the same are used in combination with pistons *F*, connected by stems *a*, in the manner and for the purpose substantially as specified.

JOSEPH BANKS.

Witnesses:

ROB. H. LOUDER,
GEO. W. REED.