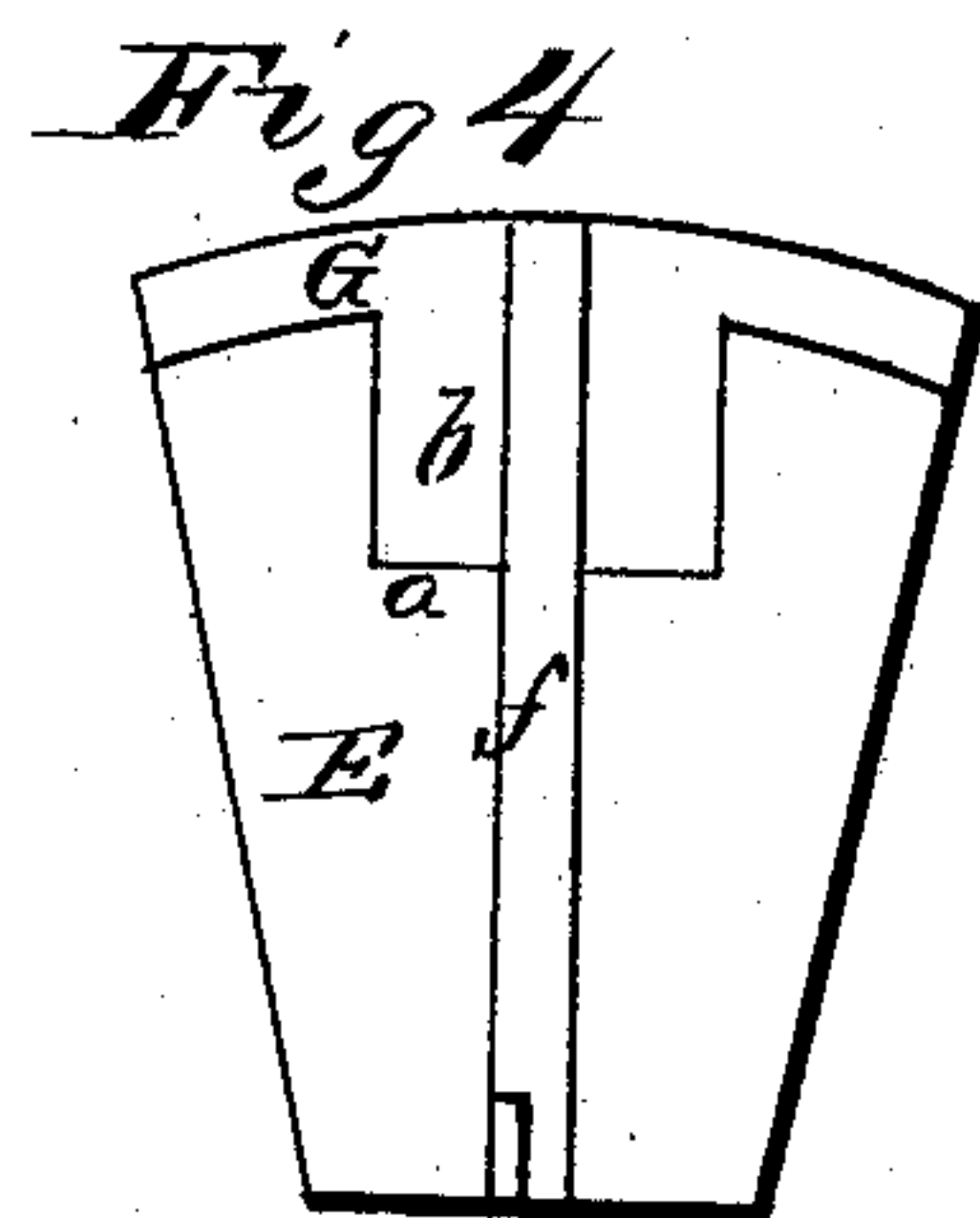
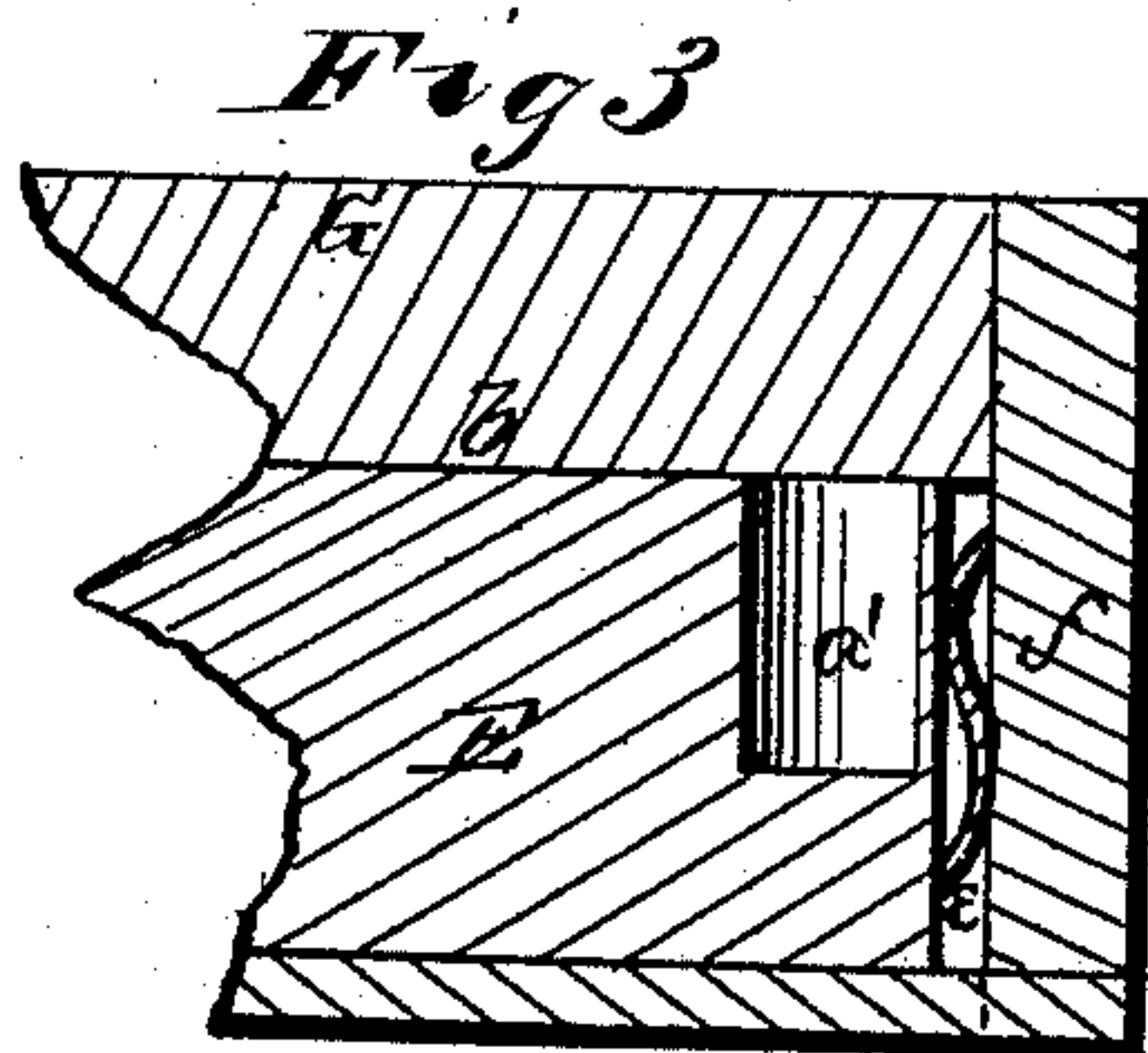
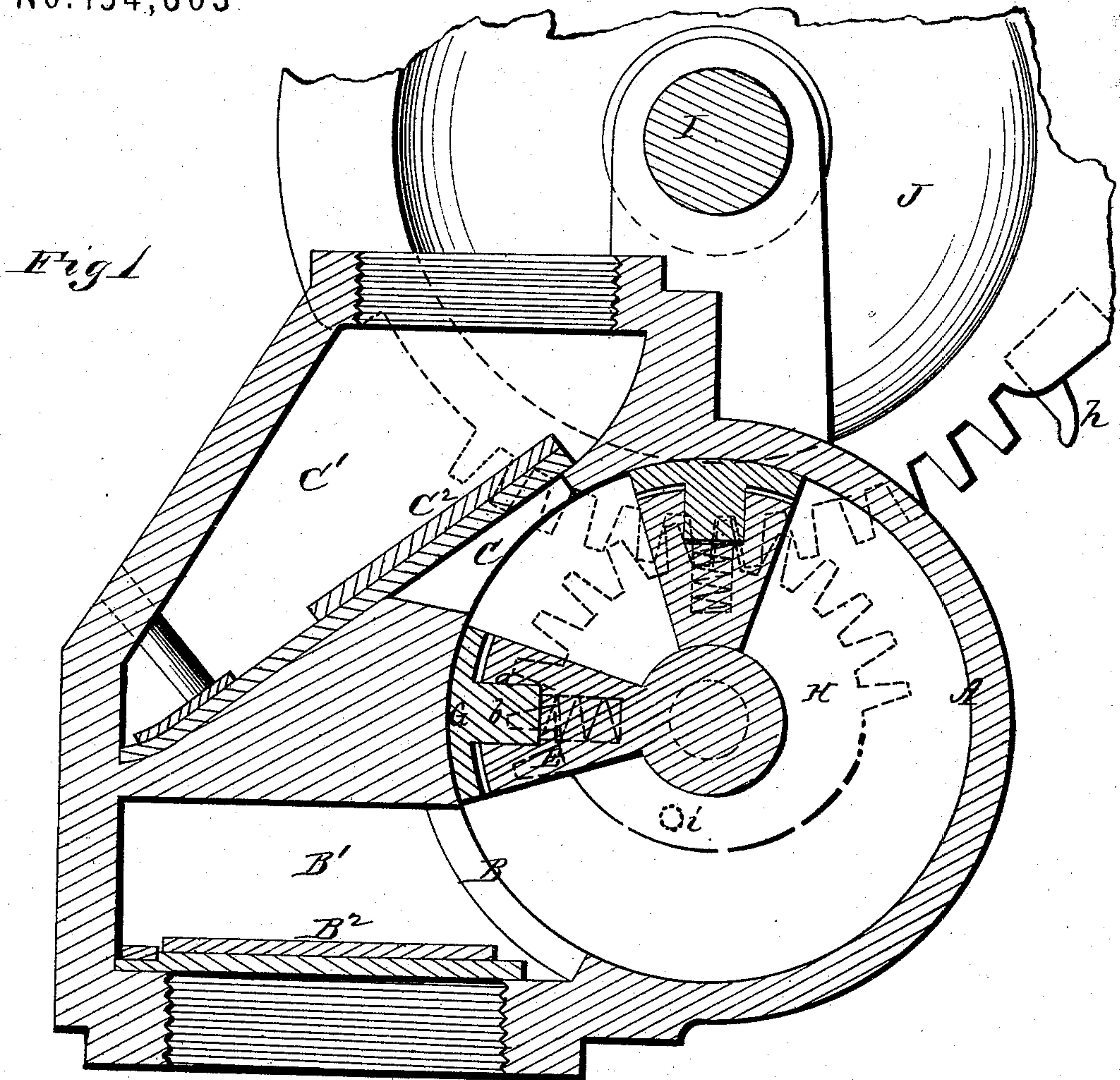


W. H. BEAL.
Rotary Pumps.

Patented Aug. 11, 1874.

No. 154,003



WITNESSES

Francis L. Oursand
C. R. Everett,

INVENTOR

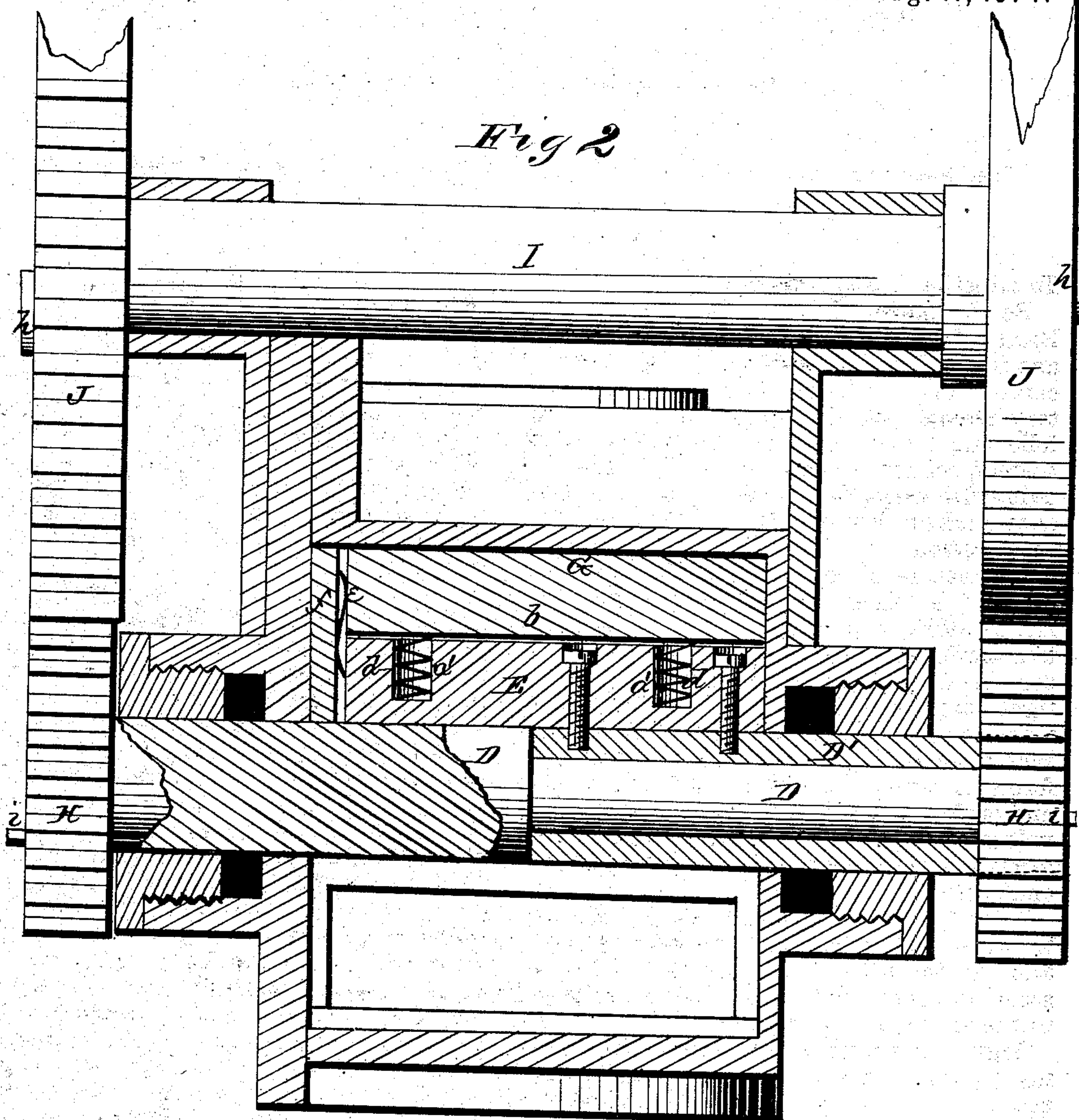
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2 Sheets--Sheet 2.

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WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM H. BEAL, OF JACKSON, TENNESSEE.

IMPROVEMENT IN ROTARY PUMPS.

Specification forming part of Letters Patent No. 154,003, dated August 11, 1874; application filed June 25, 1874.

To all whom it may concern:

Be it known that I, WILLIAM HENRY BEAL, of Jackson, in the county of Madison and in the State of Tennessee, have invented certain new and useful Improvements in Rotary Pumps; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists of a cylinder in which two or more pistons are rigidly affixed, one to each of two or more central shafts, and driven by two or more sets of cog-wheels, said pistons each forming an air-tight partition within the cylinder, and being made to revolve and stand still alternately, in such a manner that while one is stationary it forms an air-tight partition between the inlet and outlet, and the other at the same time revolves and carries out the water before it, and forms a vacuum behind, thus producing force and suction.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a transverse vertical section of my pump. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a longitudinal section of a part of one of the pistons; and Fig. 4 is an end view of the same.

A represents a cylinder, of any suitable dimensions, provided with inlet B and outlet C, arranged substantially as shown in Fig. 1. B¹ is the inlet-chamber, and C¹ the outlet-chamber, communicating with the cylinder A by the ports B and C, and provided, respectively, with valves B² and C². Through the center of the cylinder A passes a stud-shaft, D, which reaches the middle of the cylinder at full size, but is continued from there to the other end at a size sufficiently small to allow a second shaft, D', which is a tube-shaft, to work upon the small end of it, thus allowing each shaft independent action. Upon each of the shafts D and D' is secured a piston, E, made in V-

shape, as shown, and extending the entire width, from end to end, of the cylinder. In the outer face of each piston E is a longitudinal groove, a, in which is inserted a rib or flange, b, formed in the center on the inner side of a curved cap, G, said cap covering the entire outer end of the piston. In the bottom of the groove a are suitable recesses, a', in which springs d are inserted to hold the cap out against the inner surface of the cylinder. At one end of each piston is a radial slot for the insertion of a bar, f, which also passes through a slot in the cap G and rib or flange b, and is forced outward by means of a spring, e, placed behind the bar. The gearing by which the pistons are operated consists of two small cog-wheels, H H, attached one to each shaft outside the cylinder, and two large cog-wheels, J J, attached to a third shaft, I, situated outside the cylinder. The large wheels J are provided, half-way round, with cogs, in number sufficient to cause a complete revolution of the smaller wheels H H, the balance of their circumference being a smooth, plain surface. The small cog-wheels H H are provided with a recess or blank space, so that when the plain surface of the large wheel enters the recess the small wheel is stationary, and just before the toothed part of the large wheel comes around, a hook, h, therein takes hold of a pin, i, on the side of the small wheel, so as to turn the same sufficient to allow the wheels to gear and cause a complete revolution of the small wheel. The two large wheels have their plain surfaces arranged opposite to each other, so that while one small wheel is being turned the other is stationary.

By these means the pistons are made to revolve and stand still, alternately, in such a manner that while one is stationary it forms an air-tight partition between the inlet and the outlet, and the other at the same time revolves and carries out the water before it, and forms a vacuum behind, thus producing force and suction.

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

1. The V-shaped piston E, grooved as de-

scribed, and provided with the cap G, having rib *b*, the bar *f*, and springs *d* and *e*, all constructed substantially as set forth.

2. The combination, with the shafts D D' and pistons E E, of the cog-wheels H H and J J, constructed and operating substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 6th day of June, 1874.

W. H. BEAL.

Witnesses:

L. T. LINDSEY,

CHAS. H. BROWN.