A. P. BRUSH.

ROTARY FLUID PUMP.

APPLICATION FILED NOV. 10, 1913.

1,162,848.

Patented Dec. 7, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

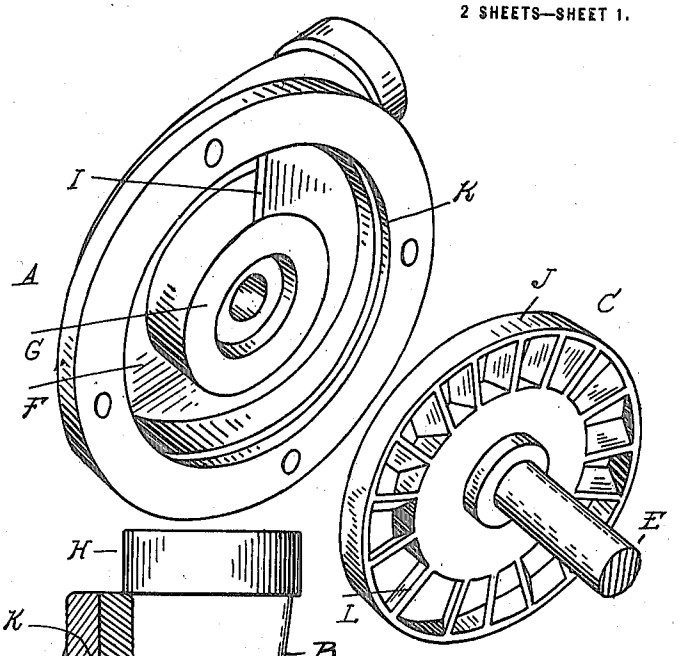
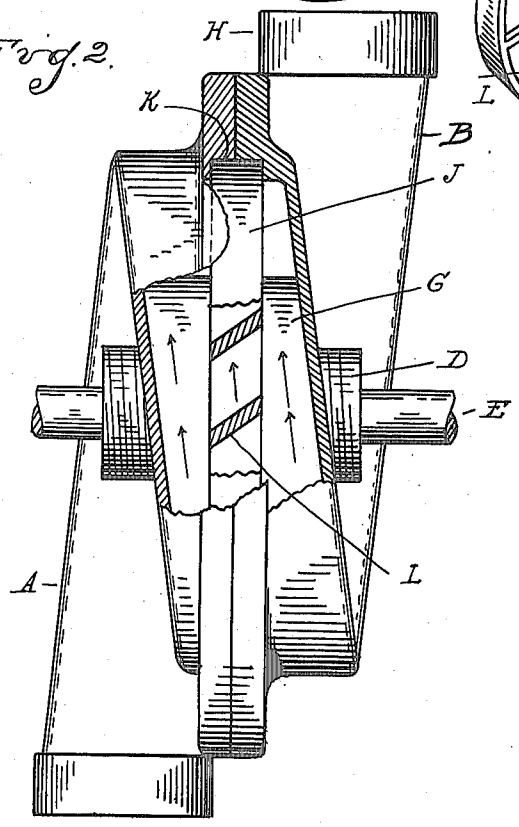



Fig. 2.




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2 SHEETS—SHEET 2.

Fig. 3.

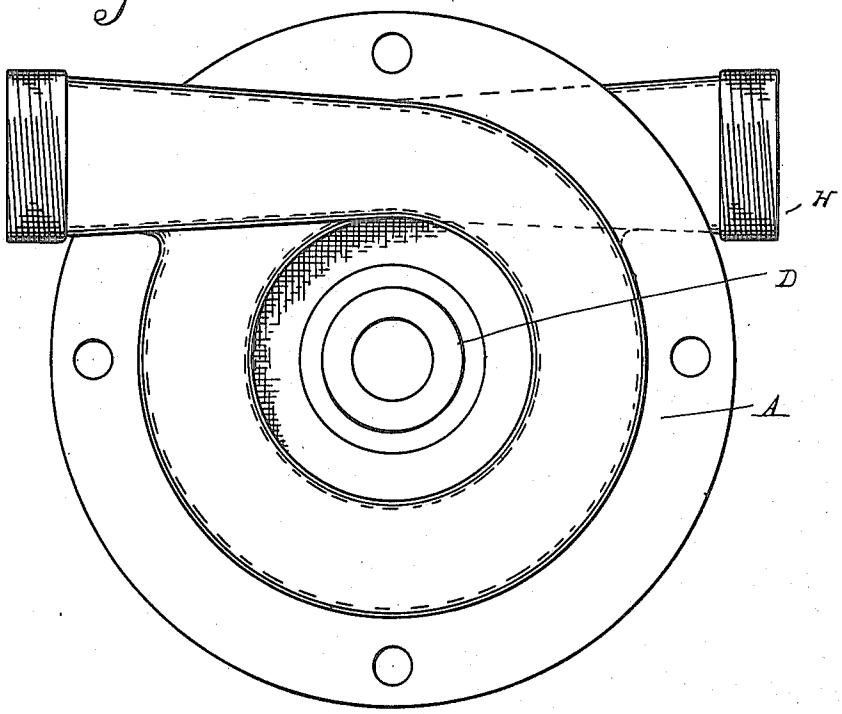
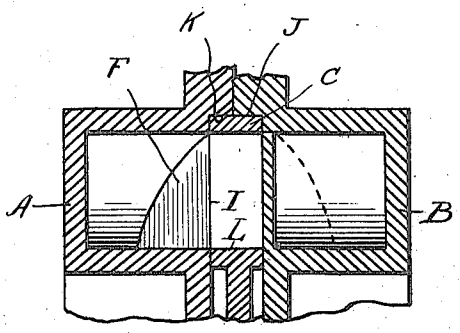



Fig. 5.



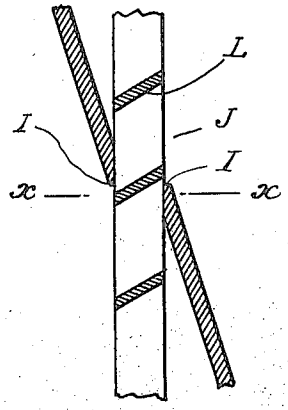




Fig. 4.

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# UNITED STATES PATENT OFFICE

ALANSON P. BRUSH, OF DETROIT, MICHIGAN.

## ROTARY FLUID-PUMP.

1,162,848. Specification of Letters Patent. Patented Dec. 7, 1915.

Application filed November 10, 1913. Serial No. 800,123.

*To all whom it may concern:*

Be it known that I, ALANSON P. BRUSH, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Rotary Fluid-Pumps, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to rotary pumps, and is more particularly designed for use in pumping liquids—such, for instance, as water in a cooling system for explosion engines, or oil in lubricating systems.

It is the object of the invention, first, to obtain a construction which is inexpensive to manufacture and is efficient in operation; second, to form the casing in duplicate complementary sections between which the rotor is arranged and which form bearings for the drive shaft thereof.

With these and other minor objects in view, the invention comprises certain features of construction as hereinafter set forth.

In the drawings: Figure 1 is a perspective view of one of the casing sections and rotor detached; Fig. 2 is an edge elevation of the pump partly in section; Fig. 3 is a side elevation thereof; Fig. 4 is a sectional view, illustrating a detail of construction. Fig. 5 is a cross section on the line *x*—*x* of Fig. 4.

A and B are two duplicate casing sections, which may be arranged complementary to each other to form a chamber receiving the rotor C, and central bearings D for the rotor shaft E. Each casing comprises a spiral or helical passage F surrounding a central hub portion G, one end of said passage terminating in a nipple H, while partition wall at the other end tapers to a knife edge I, preferably after one complete convolution. The rotor C is in the form of a disk arranged between the hub portions F of the casing, having a peripheral portion J engaging an annular recess or rabbet K in the casing sections, while opposite the spiral or helical passages the disk is cut away to form a series of spaced blades L. These blades are preferably at an angle transverse to the angle of the spiral passages, and serve to impart a rotary movement to the water in said passages, and also to cause a flow from one passage to the other. As shown in Fig. 2, it will be observed that the spiral passage on one side of the rotor is constantly diminishing in width or cross section, while that upon the opposite side is correspondingly enlarging. Thus if rotary movement is imparted to the water in these passages, movement in one direction will cause the flow of water through the spaces in the rotor from the contracting passage to the enlarging one, while rotation in the reverse direction will produce precisely the opposite effect. Furthermore, the blades of the rotor are so angled as to assist in causing the flow of liquid through the intervening spaces and to impart the required rotary movement to the water in the spiral passages. Consequently the liquid may be propelled through the casing with equal facility in opposite directions by merely reversing the direction of movement of the rotor.

The construction is a simple one to manufacture, and both the casing sections and the rotor may be formed by die castings, thereby dispensing with all machine work, while the assembly of the parts requires merely the placing of the sections upon opposite sides of the rotor and clamping them together.

As shown and preferably constructed, the spiral or helical passage in each casing section forms one complete convolution and then extends to the inlet or outlet nipple. The casing sections are also arranged in such relation to each other that the knife edges I are substantially opposite each other, while the inlet and outlet nipples extend in opposite directions. Such an arrangement I have found to produce a much greater efficiency than where turned in any other position.

What I claim as my invention is:

1. The combination with a bladed rotor, of a casing section arranged at one side of said rotor and provided with a spiral passage forming one complete convolution, one end of said passage connecting with an external orifice and the opposite end tapering to the plane of the rotor and separated by a knife-edge partition from the adjacent convolution.

2. The combination with a bladed rotor of a casing having a spiral passage therethrough forming two complete convolutions, terminating in oppositely extending tangential inlet and outlet, the plane of said rotor being intermediate said convolutions and oblique thereto, and partitions separating each convolution from the tangential outlet, the ends of said partitions being substan-

tially opposite each other on opposite sides of said rotor.

3. The combination with a bladed rotor of a casing formed in complementary sections on opposite sides of said rotor, each section provided with a spiral passage forming one complete convolution with a tangential outlet separated from the adjacent convolution by a partition, the ends of said partitions in the complementary sections being substantially opposite each other.

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

ALANSON P. BRUSH.

Witnesses:
WM. J. BELKNAP,
JAMES P. BARRY.