No. 895,488. PATENTED AUG. 11, 1908.

B. K. MOREHOUSE.

ROTARY PUMP.

APPLICATION FILED FEB. 26, 1907.

4 SHEETS—SHEET 1.

Fig. 1.

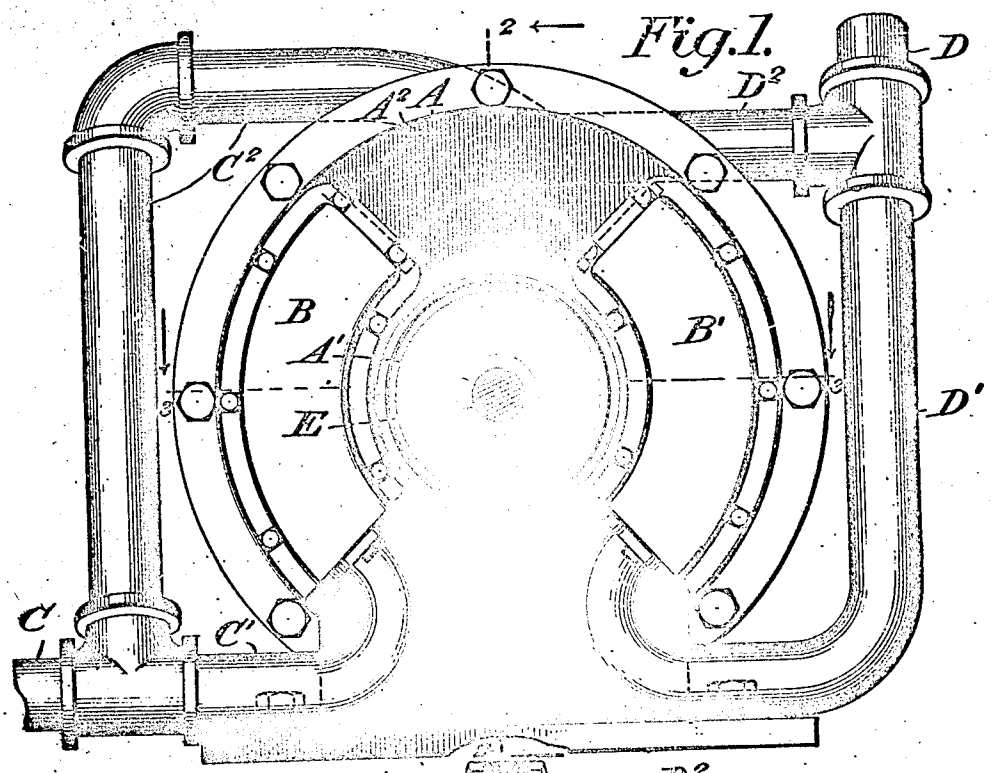
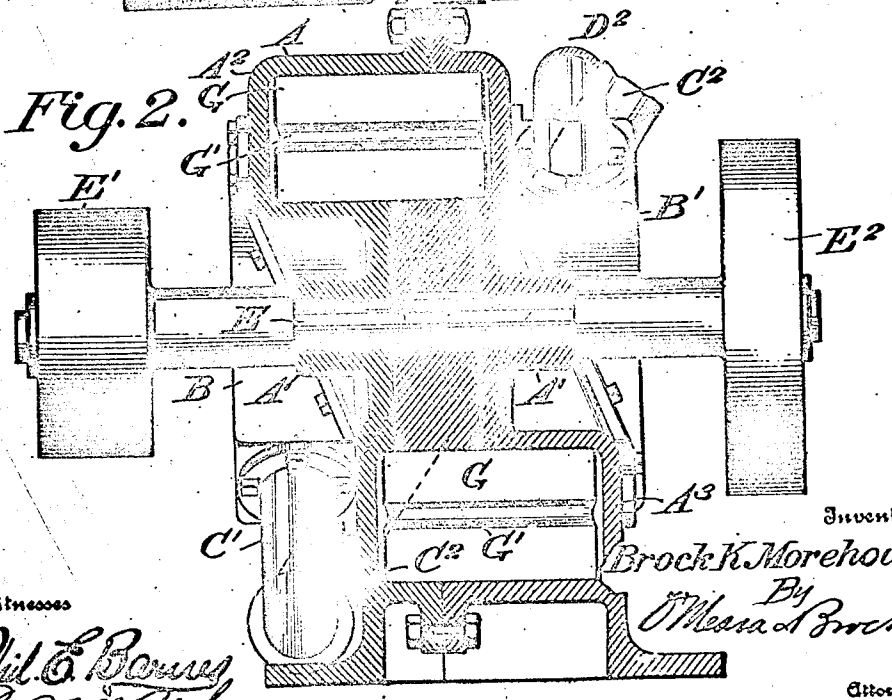


Fig. 2.



Witnesses

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Fig. 3.

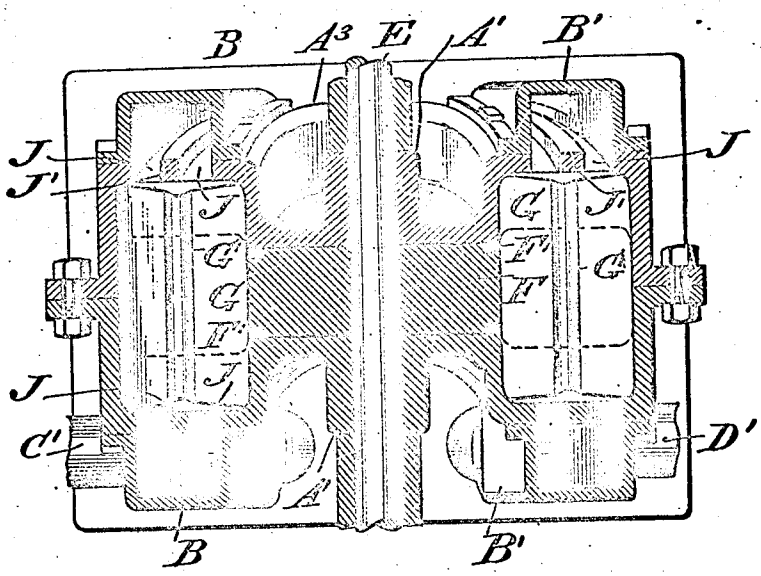


Fig. 4.

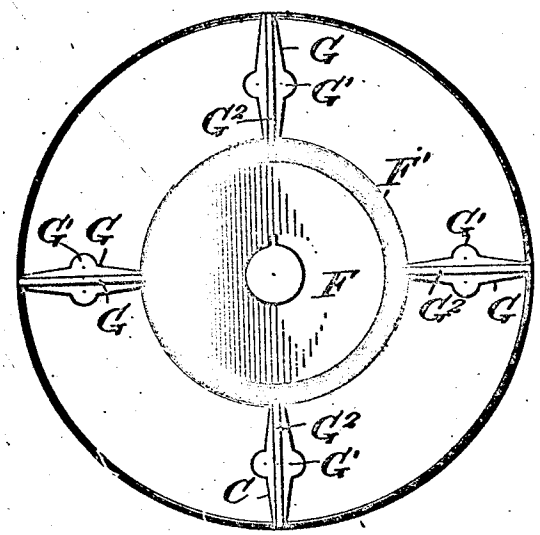
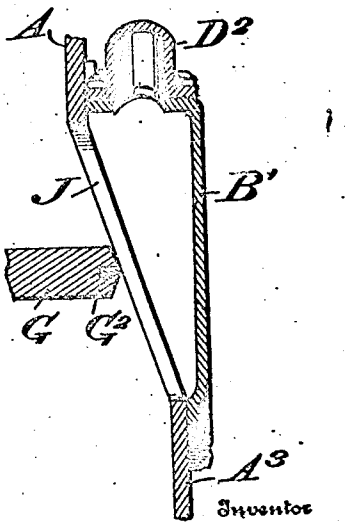


Fig. 5.



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Fig. 6.

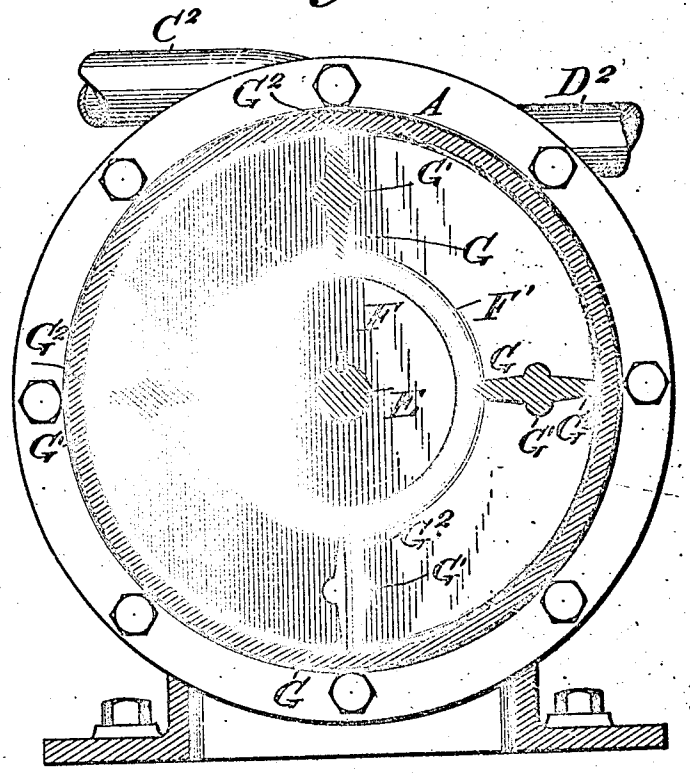
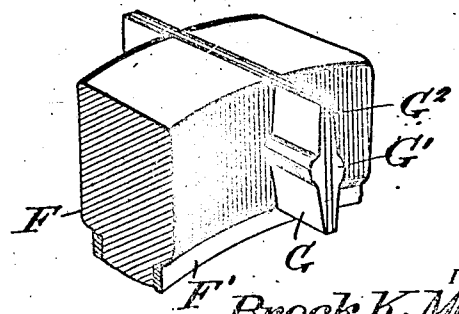


Fig. 7.



WITNESSES

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APPLICATION FILED FEB. 26, 1907. 4 SHEETS—SHEET 4.

Fig. 8.

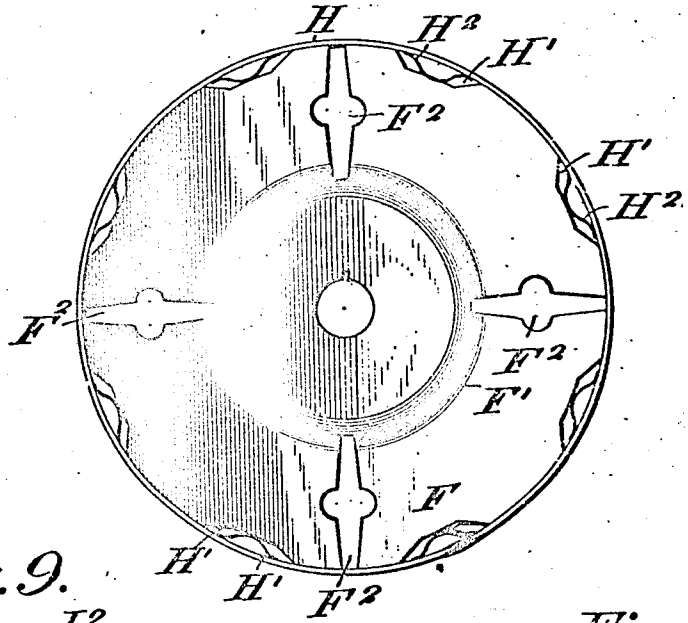


Fig. 9.

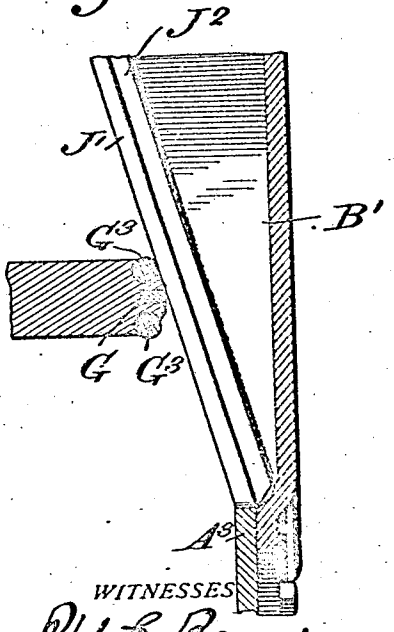
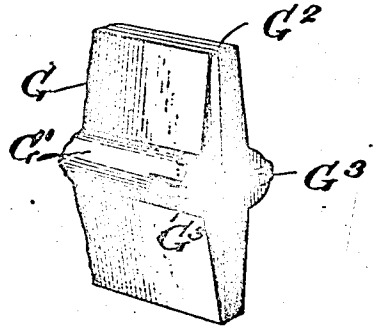


Fig. 10.



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ROTARY PUMP.

No. 895,488. Specification of Letters Patent. Patented Aug. 11, 1908.

Application filed February 26, 1907. Serial No. 359,338.

To all whom it may concern:

Be it known that I, BROCK K. MOREHOUSE, a citizen of the United States, residing at Grand Junction, in the county of Mesa and State of Colorado, have invented a new and useful Improvement in Rotary Pumps, of which the following is a specification.

This invention relates to a rotary pump designed for lifting water, the object of the pump being to lift at a comparatively low speed a considerable quantity or weight of water, and a further object of the invention is a pump of the rotary type to which water will be supplied upon each side and discharged from each side, thus balancing the pump.

The invention consists of the novel features of construction hereinafter fully described, pointed out in the claims and shown in the accompanying drawings, in which,

Figure 1 is a side elevation of the pump. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a horizontal section taken in the plane of a shaft. Fig. 4 is a side view of a wheel provided with movable blades. Fig. 5 is a detail sectional view showing a portion of a side of the pump casing, and an end of one of the blades. Fig. 6 is a vertical section taken through the circumference of the pump casing. Fig. 7 is a detail view of a rim portion of the wheel showing one of the blades. Fig. 8 is a side elevation showing a slightly modified form of wheel. Fig. 9 is a detail section through a portion of one side of the casing showing in section an end portion of one of the blades and illustrating certain modifications in the construction of the casing and of the blade. Fig. 10 is a detail perspective view of an end portion of one of the blades illustrating the modification shown in section in Fig. 9.

In these drawings A represents a casing formed in two halves which are bolted together, each half or section forming one side of the complete casing. Each section carries a central hub portion A′ and these hub sections are parallel to each other. One of the sections is provided upon its upper portion with an outwardly extending projecting portion A^2 and the other side or section is provided in its lower portion with a corresponding and oppositely extending projection A^3.

The complete casing therefore when mounted upon a base inclines from the perpendicular, the upper portion being off-set with respect to its lower portion and connected thereto by curved side walls, as is most clearly shown in Figs. 2 and 3.

Upon each side of the casing are secured supplemental casings B and B′, these casings being oppositely arranged upon opposite sides of the casing, as indicated in Figs. 2 and 3. The supply pipe C is provided with two branches C′ and C^2 which lead respectively to the casings B into which they discharge, the branch C′ discharging into the lower portion of its casing B and the branch C^2 discharging downwardly into the upper portion of its casing B, and it will be understood that these casings B are upon opposite sides of the casing A and are also upon opposite sides of a central shaft to be hereafter described.

A discharge pipe D receives water from the casings B′ through branches D′ and D^2, which also start from opposite sides of the casing A. In the hub portions A′ is journaled a shaft E which carries a pulley E′ upon one side of the casing A and a balance wheel E^2 upon the other side. A disk F is keyed to the shaft E and fills the space between the hub portions A′ and this space is made water tight packing rings F′ set into the disk F upon its opposite faces. That portion of the disk between its periphery and the packing rings F′ is provided with radial slots preferably four in number and ninety degrees apart and these slots are entirely filled by laterally movable blades G which work in them. The blades G I strengthen by forming longitudinally upon each side of the blade a central rib G′ and I also groove the side and end edges of the blades and place in said grooves a suitable packing G^3.

The ends of the blades I prefer to round or bevel as shown in Fig. 5. I also place strips of packing material H upon the periphery of the wheel F which strips extend from blade to blade.

To admit water into and from the casing A I form curved slots J in the side portions of the casing covered by the supplemental casings B and B′ so that communication is afforded between the interior of the casing A and these supplemental casings. I prefer to form the slots J in pairs leaving between the slots of each pair a web J′.

In Figs. 8, 9 and 10 I have illustrated some slight additions to the construction above described which are as follows:—The wheel F is recessed upon its periphery as shown at H′ and the packing material H is a continu-

ous ring which passes entirely around the wheel F passing over the blades G and in the recess H' are placed springs H² which bear outwardly upon the packing ring H. The ends of the blades G are also recessed upon opposite sides and rollers G³ are mounted in said recess in position to engage at certain points sides of the casing A, thus reducing friction. I also strengthen the webs J' by providing them with ribs J² as shown in Fig. 9.

The operation of the device is as follows:— As the shaft E and wheel F are rotated the blades G by reason of the sloping of the sides of the casing A are moved back and forth through the slots of the wheel F. For example, when a blade is at the extreme top of the casing it will be upon what may be termed the left-hand side of the wheel F, and will extend parallel and entirely across the projecting upper portion A² of the casing. This position is illustrated in Fig. 2. When the wheel has made a one-fourth rotation clockwise, the blade will extend equally upon each side of the wheel F. This position of the blade is shown in Fig. 3 and Fig. 7. When a one-half rotation has been made the blade will have reached the limit of its travel to the right and will be in the position occupied by the lower blade in Fig. 2, which position is also shown by the blade when in elevation in Fig. 6.

When three-fourths of a revolution have been completed the blade will have traveled back toward the left-hand side and is again in the position, with respect to the wheel F shown in Figs. 3 and 7, and the blade will be moving in the direction of the arrow upon the left-hand blade of Fig. 3. At the same time the blade diametrically opposite the blade whose cycle is being described will be in the same relative position but will be moving in the opposite direction as indicated by the arrow upon the right-hand blade.

As the revolution of the wheel F is completed the blade will have returned to the position occupied by the upper blade in Fig. 2. The movement of the blades being thus understood their action upon the water admitted to the pump will be readily understood. Water admitted into the casing B upon the left-hand side of the casing A will be caught as it passes through the slots J by an ascending blade and carried over and above the shaft through the projecting portion A² and be forced through the slots J into the casing B' and into the branch pipe D', the blade in the meantime passing over to the other side of the casing. The water which had been carried around by said blade cannot however, pass through the wheel F and is therefore necessarily forced out through the casing B'.

At the same time the blade opposite the one just referred to is acting upon water fed through the pipe C³ and as said blade moves downwardly it carries its supply of water under the shaft E through the portion A³ of the casing and forces it out through the casing B' upon the right-hand side of the pump and through the pipe D².

It will be obvious that each blade not only forces either over or under the shaft as the case may be, the water in advance of it, but also by suction draws in an additional supply of water to be caught by the succeeding blade. It will be obvious that as one blade passes through the wheel F and is relieved of its load upon one side by the following blade, it takes up an additional load upon the opposite side and in turn relieves the preceding blade. The pump is therefore always balanced, the blades performing each an equal amount of work upon each side of the wheel F.

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

1. A rotary pump comprising a casing having hub portions, a shaft therein, a wheel upon said shaft, the said casing having parallel projecting portions upon opposite sides of said hub portion, blades carried by the wheel and movable through the wheel, said blades working in said projecting portions, supplemental casings carried by each side of the casing first mentioned, the said first mentioned casing having communication with the supplemental casings, a supply pipe having branches, one of said branches opening into a supplemental casing upon one side, and into a supplemental casing upon the opposite side of the first mentioned casing and discharge pipes leading from the remaining supplemental casings, as and for the purpose set forth.

2. A rotary pump comprising a casing having inclined parallel walls, a shaft journaled in said casing, a vertically arranged wheel mounted upon said shaft, blades carried by said wheel and movable therethrough, said blades being reciprocated through the wheel by contact with the inclined walls of the casing, supplemental casings carried by each side of the main casing, supply and discharge pipes opening into the lower portions of the supplemental casings upon one side and supply and discharge pipes opening into the upper portions of the supplemental casings upon the other side, as and for the purpose set forth.

3. A pump of the kind described comprising a casing having oppositely off-set upper and lower portions, a shaft journaled in the casing, a wheel provided with radial grooves mounted on the shaft, blades working through said grooves and projecting alternately beyond opposite sides of the wheel, supplemental casings arranged upon opposite sides of the shaft upon each side of the first mentioned casing, the said first mentioned casing being slotted to give communi-

cation with the supplemental casings, a supply pipe opening into the lower portion of one of the supplemental casings on one side, a discharge pipe leading from the lower portion of the supplemental casing upon the same side, a supply pipe opening into the upper portion of a supplemental casing upon the opposite side and diametrically opposite the first mentioned supply pipe, and a discharge pipe leading from the upper portion of the remaining supplemental casing, as and for the purpose set forth.

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