

S. P. HATFIELD.
PUMP.

APPLICATION FILED AUG. 14, 1906.

2 SHEETS—SHEET 1.

FIG 2.

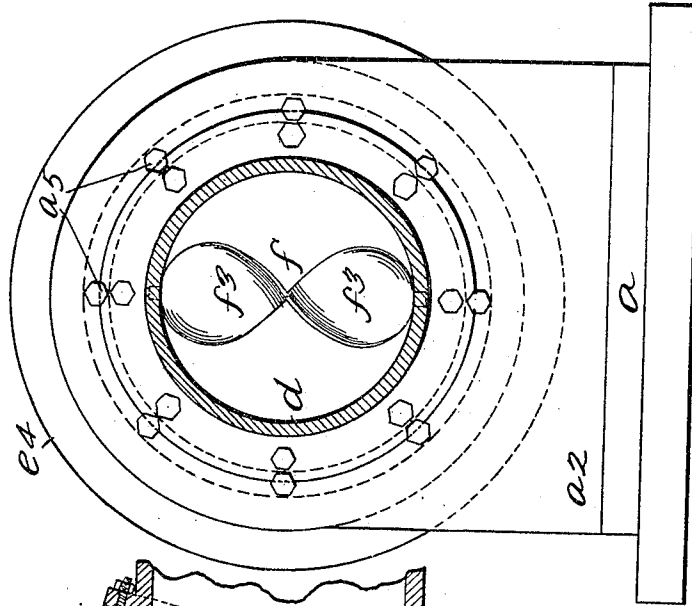
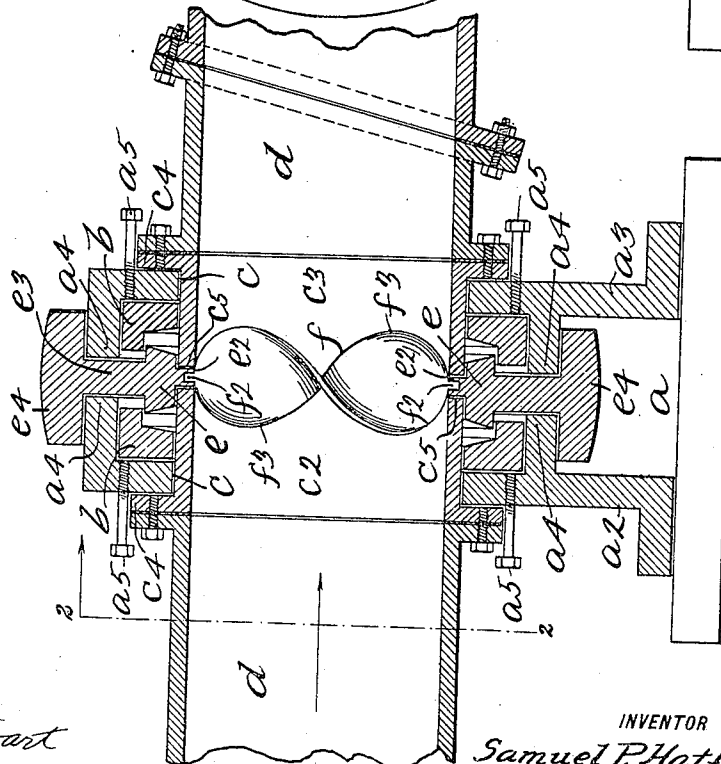


FIG 1.



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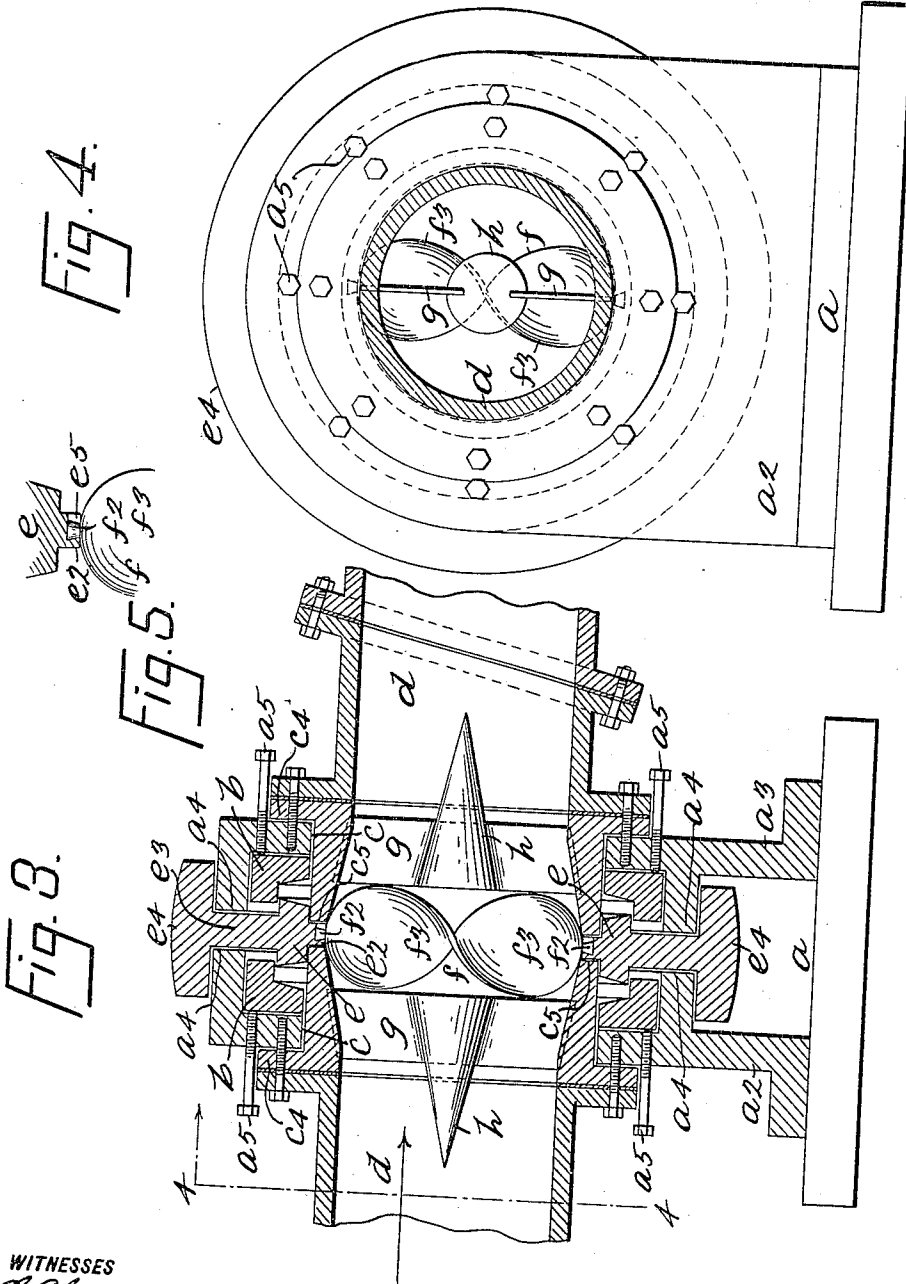
No. 839,757.

PATENTED DEC. 25, 1906.

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2 SHEETS—SHEET 2.



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PUMP.

No. 839,757.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, SAMUEL P. HATFIELD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Pumps, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide a pump for straight through service without the intervention of valves, piston, shafts, bends, or change of direction in the flow of material to and from the pump that will tend to create friction and absorb power, and also to provide a pump where the power necessary to drive the same is applied at a point advantageous for greatly diminishing the power usually required to drive centrifugal or other pumps, a still further object being to provide a pump of this class which is adapted for use in pumping fluids charged with earthy or other matter or any viscous material for which pumps may be used and by means of which the swirl or rotary movement of water therethrough is prevented; and with these and other objects in view the invention consists of a pump constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which—

Figure 1 is a longitudinal sectional view of a pump constructed according to my invention; Fig. 2, a section on the line 2 2 of Fig. 1; Fig. 3, a view similar to Fig. 1, but showing a modification thereof; Fig. 4, a section on the line 4 4 of Fig. 3, and Fig. 5 an enlarged detail view of the construction.

In the practice of my invention I provide a casing and support a , composed of two similar side members a^2 and a^3 , having inwardly-directed flanges or rims a^4 and a central transverse circular opening c , in which are placed tubular sections c^2 and c^3 , having outwardly-directed flanges, to which are secured pipe members d .

Within the annular space formed by the flanges a^4 of the side members a^2 and a^3 of the casing and support are placed packing-rings b , which are substantially L-shaped in cross-section, and passing through the frame and support members a^2 and a^3 are set-screws

a^5 , by which the position of the packing-rings b may be adjusted.

Between the inner ends of the tubular sections c^2 and c^3 is a narrow annular space c^5 , and mounted in the annular chamber formed by the packing-rings b and rotatable on the tubular sections c^2 and c^3 is a band e , provided centrally with an inwardly-directed rim or flange e^2 , movable in the space c^5 between the tubular sections c^2 and c^3 , and the rotatable band e is provided centrally with an outwardly-directed flange or web member e^3 , which carries a pulley or belt member e^4 , and it will be understood that the packing-rings b may be adjusted by means of the screws a^5 so as to closely fit the band e and the web member e^3 thereof in order to prevent leaking.

Secured in or connected with the inwardly-directed flange or rim e^2 of the band e in any desired manner is a propeller f , provided in the form of construction shown with lugs f^2 , which engage the flange or rim e^2 in such manner as to be held therein against rotation and to turn with the band e , and in the construction shown the propeller f is provided with two blades f^3 ; but it will be obvious that any desired number of blades may be employed, and said blades may be of any desired shape or form, and in practice an ordinary driving-belt is placed on the band or belt pulley e^4 , and said belt may be driven by any desired power, and in this way the band e and the propeller f may be rapidly turned or rotated, and the direction of said rotation will determine the direction of the fluid through the pipes d and the tubular sections c^2 and c^3 .

In Figs. 3 and 4 of the drawings I have shown a modification of the construction shown and described in Figs. 1 and 2, whereby the passage through the tubular sections c^2 and c^3 is inclined to produce a greater diameter at the inner ends thereof, and mounted in each tubular section c^2 and c^3 is a diaphragm g , which extends entirely across the corresponding tubular section, and each of the diaphragms g is provided centrally thereof with a cone h , which are each inclined in a direction away from the propeller-blade f , and the diaphragms g are so placed for the purpose of preventing the rotation of the body of fluid in the pipes both upon entering and leaving the pump under the rotary action of the propeller. In order to obtain the effect of velocity of motion in the outer parts

of the propeller-blades, the tubular sections c^2 and c^3 are enlarged, as shown, and the diameter of the propeller is thereby increased, and, the cones h being arranged centrally of the tubular sections c^2 and c^3 , the water being pumped is thrown out or drawn to the more swiftly-moving parts of the propeller, as well as to that portion of the blades thereof which is curved in a greater degree, and it will be seen by means of this construction that a greater head of water results at the outlet, according to the diameter of the propeller and the dimensions of the cones.

In Fig. 5 of the drawings I have shown my preferred method of mounting the propeller f in the flange e^2 , and said method consists in having an angular dovetail opening e^5 in the flange e^2 , into which a similarly-shaped lug f^2 of the propeller f is adapted to be slid, and the propeller f is thereby held against rotation in the flange e^2 .

My invention is simple in construction and operation, very inexpensive, and takes but little room, and I dispense, as previously stated, with the use of valves, pistons, and shafts and apply my power directly at the point of most resistance, and by means of this construction I am enabled to not only pump fluids, but fluids thickly charged with earthy or other material, and force the same in the direction intended, and while I have shown my support or casing open at its top it will be obvious that the same may be closed in order to protect the band-wheel e^4 , and various other changes in and modifications of the construction herein shown and described may be made without departing from the spirit of my invention or sacrificing its advantages.

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

1. In a pump, a casing and support comprising similar side members having inwardly-directed annular flanges and central circular openings, tubular sections secured in said openings and separated at their inner ends by a narrow annular space, packing-rings mounted in said casing and support members, a rotatable band mounted on the inner ends of the tubular sections and held in place by said packing-rings, said rotatable band being provided centrally with an outwardly-directed web member carrying a belt-pulley, and a propeller arranged within and transversely of the tubular sections and connected with said rotatable band.

2. In a pump, a casing and support comprising similar side members having inwardly-directed annular flanges and central circular openings, tubular sections secured in said openings and separated at their inner ends by a narrow annular space, packing-

rings mounted in said casing and support members, a rotatable band mounted on the inner ends of the tubular sections and held in place by said packing-rings, said rotatable band being provided centrally with an outwardly-directed web member carrying a belt-pulley, and a propeller arranged within and transversely of the tubular sections and connected with said rotatable band, said tubular sections being provided with diametric diaphragms provided with cones arranged concentrically in said tubular sections and centrally thereof.

3. In a pump, a frame formed by similar side members having inwardly-directed flanges and central transverse openings, a central casing formed by tubular sections secured in said openings, said tubular sections being tapered inwardly and outwardly so as to enlarge the central portion of said casing, said tubular sections being also separated at their inner ends by a narrow space, packing-rings mounted in the side frame members and on the separate tubular sections, a rotatable band mounted on the opposite ends of the tubular sections and held in place by said packing-rings and said rotatable band and being provided centrally with an outwardly-directed annular web having a belt-pulley, and a propeller arranged transversely of the tubular casing formed by the tubular sections and connected with said rotatable band.

4. In a pump, a frame formed by similar side members having inwardly-directed flanges and central transverse openings, a central casing formed by tubular sections secured in said openings, said tubular sections being tapered inwardly and outwardly so as to enlarge the central portion of said casing, said tubular sections being also separated at their inner ends by a narrow space, packing-rings mounted in the side frame members and on the separate tubular sections, a rotatable band mounted on the opposite ends of the tubular sections and held in place by said packing-rings and said rotatable band and being provided centrally with an outwardly-directed annular web having a belt-pulley, and a propeller arranged transversely of the tubular casing formed by the tubular sections and connected with said rotatable band, said tubular sections being also provided with transverse diametric diaphragms provided with concentrically-arranged cones.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 12th day of August, 1905.

SAMUEL P. HATFIELD.

Witnesses:

F. A. STEWART,
C. E. MULREANY.