

(No Model.)

3 Sheets—Sheet 1.

E. SEITZ & R. P. PARK.
CENTRIFUGAL PUMP.

No. 531,652.

Patented Jan. 1, 1895.

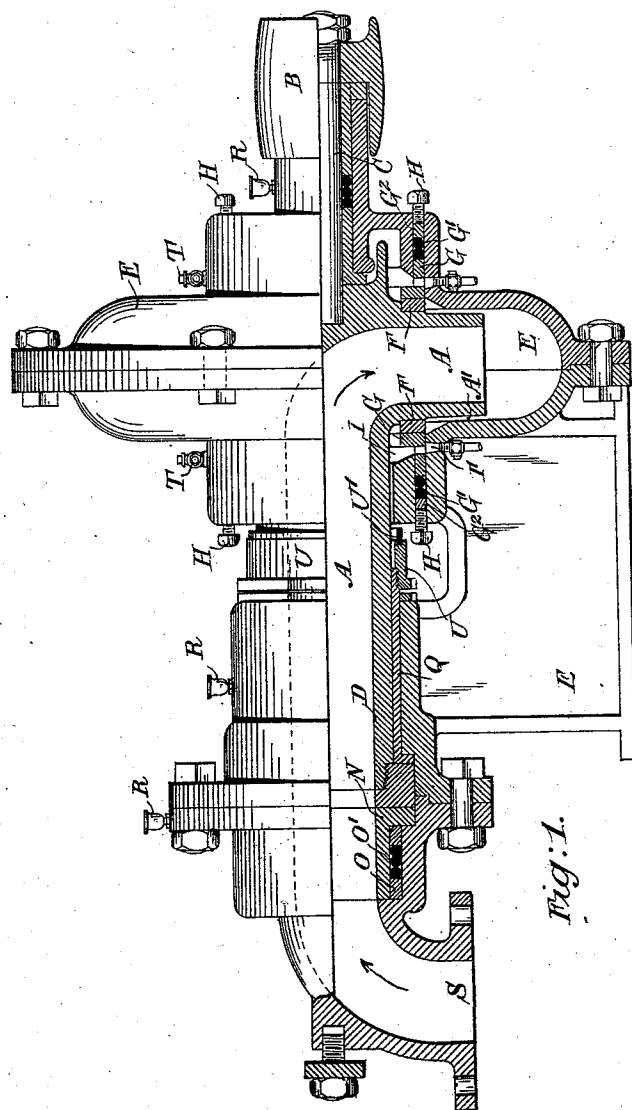


Fig. 1.

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Richard Pickup Park,
By J. M. Bowman,
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(No Model.)

3 Sheets—Sheet 2.

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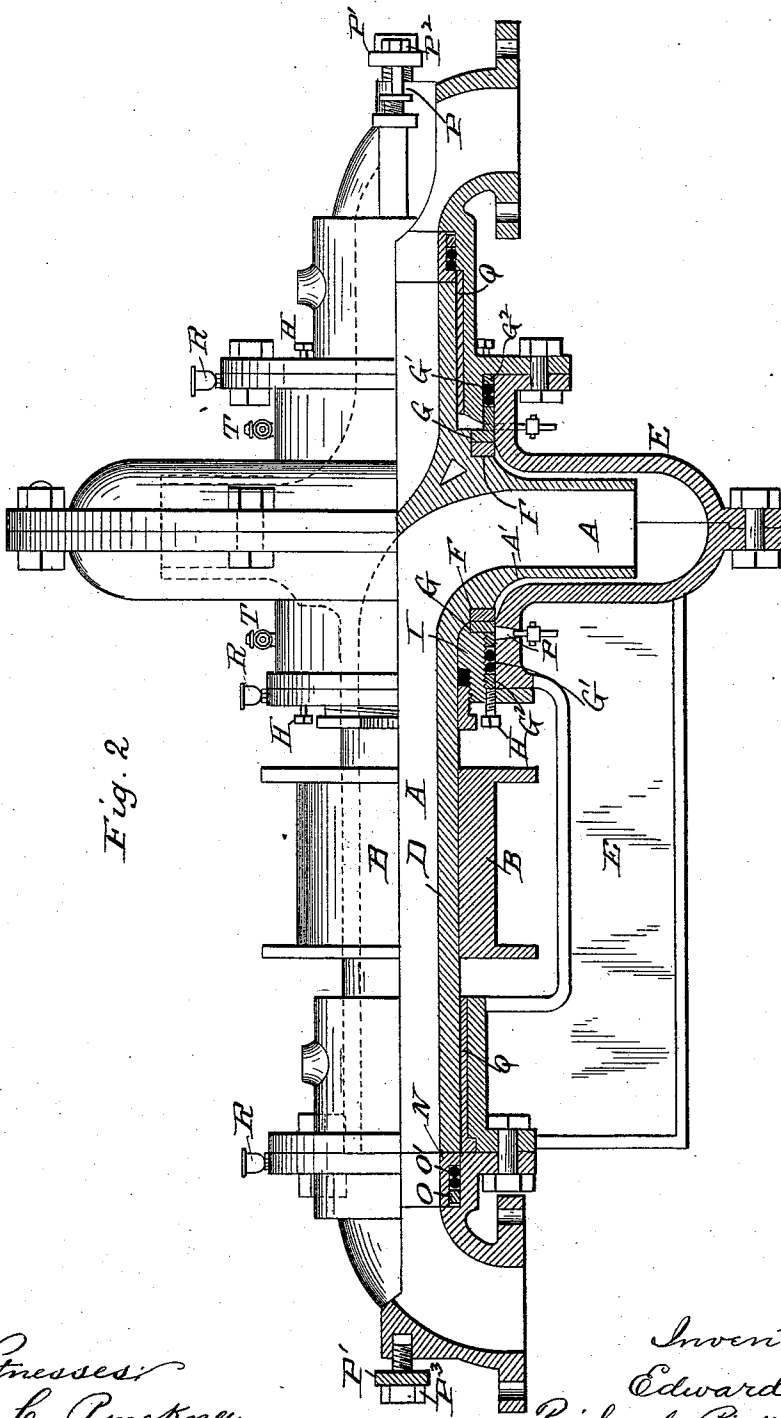


Fig. 2

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(No Model.)

3 Sheets—Sheet 3.

E. SEITZ & R. P. PARK.
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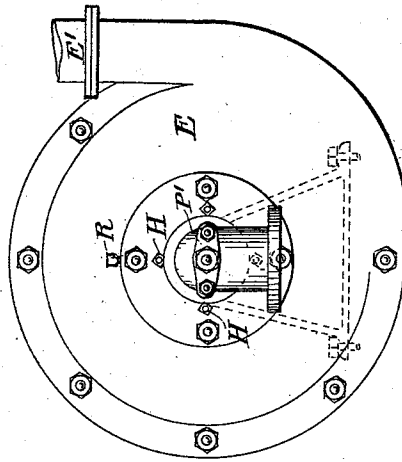


Fig: 3.

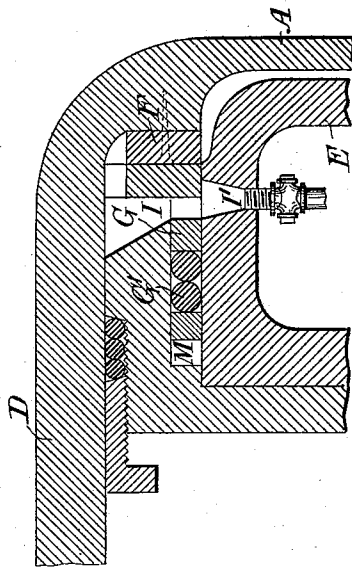


Fig: 5.

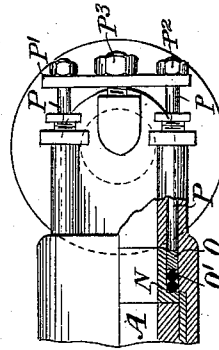


Fig: 4.

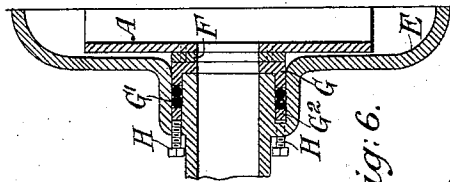


Fig: 6.

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UNITED STATES PATENT OFFICE.

EDWARD SEITZ AND RICHARD PICKUP PARK, OF BLACKBURN, VICTORIA.

CENTRIFUGAL PUMP.

SPECIFICATION forming part of Letters Patent No. 531,652, dated January 1, 1895.

Application filed January 31, 1894. Serial No. 498,599. (No model.)

To all whom it may concern:

Be it known that we, EDWARD SEITZ and RICHARD PICKUP PARK, subjects of the Queen of Great Britain, and residents of Blackburn, in the Colony of Victoria, Australia, have invented certain new and useful Improvements in Centrifugal Pumps, of which the following is a specification.

This invention has been devised for the purpose of overcoming certain objectionable features in connection with centrifugal pumps at present in common use, and at the same time to supply additional facilities for the more efficient working of this class of pumps than has hitherto been achieved.

In the past it has been found that when working ordinary centrifugal pumps in connection with water or fluids containing impurities, such as sand, grit, sludge, &c., such impurities find their way to, or circulate from the body of the pump toward and into the bearings, bearing surfaces, or glands, and cause, by the consequent friction, such parts to wear away abnormally; also that the fluid finds its way from the body of the pump back again to the intake end of the runner. It has also been found desirable to provide some means to efficiently prevent any communication or circulation between the body of the pump and the bearings toward the inlet, or suction end of the pump, in order to obviate the ingress of any air or other fluid which might find its way through the worn surfaces of such bearings into the pump and thus interfere with the vacuum in said pump. It has also been found desirable that some efficient mechanism should be provided for balancing or adjusting the thrust pressure usually trending in centrifugal pumps toward the suction end of the runner.

Now our invention fulfills these functions by the medium of simple, efficient and easily adjustable mechanisms, and in order that our invention may be more easily understood, reference may be made to the accompanying drawings, in which—

Figure 1 illustrates a semi-sectional elevation of a single action centrifugal pump fitted with our improvements; Fig. 2, a semi-sectional elevation of a double action centrifugal pump similarly fitted; Fig. 3, an end view

of Fig. 2; Fig. 4, a plan view, partly in section, of mechanical details shown in elevation at one end of Fig. 1 and at both ends of Fig. 2. Fig. 5 illustrates a sectional view of an alternative mechanism for operating certain portions of our improvements, hereinafter to be described, while Fig. 6 illustrates a sectional elevation of certain of our improvements as applied to a pump different in pattern to that shown on the other figures.

In the figures A represents the runner of a centrifugal pump which, for the purposes of illustration, we have shown constructed on the "hollow pipe shaft" principle, but, so far as the invention is concerned, this runner may be of any design usually employed in centrifugal pumps.

B is the pulley by which motion is transmitted to the pump and which (as shown in Fig. 1) is placed upon the small solid shaft C and in Fig. 2 upon the hollow pipe shaft D, which latter constitutes part of the pump and is *de facto* a continuation of the tubular runner A.

E represents the casing and frame-work of the pump.

F is an annular faced plate or ring of metal conveniently arranged anywhere along the outer area or diameter of the runner A, but preferably in the position shown on Figs. 1, 2 and 5 of the drawings. In lieu of this face plate or annular ring F, a face may be turned upon the metal of A, but we prefer such ring or plate to be distinct from the runner A, so that it may be unscrewed and replaced if it becomes unduly worn.

G (see Figs. 1, 2 and 5) is an annular plate or ring of metal, preferably, but not arbitrarily, constructed of an L shaped section as shown, and its face is neatly turned to agree with the face on the annular plate F, so that the face of F may revolve against the face of G with as little friction but as close proximity as possible. The annular plate or ring G is kept in position by reason of the pressure of the rubber rings, or their equivalents G', which in their turn are adjusted in position by the screw H pressing upon the ring G², which is annular, the whole being so arranged that a gentle, but sufficient, pressure or contact is maintained by the plate G against the

plate F during the revolution of the latter to prevent sludge or gritty matter from finding its way from the body of the pump at A' into the chambers I, or as shown in Fig. 6 to prevent the fluid passing from the main chamber of the pump into the entrance of the runner.

The chamber (I) hereinbefore referred to (see Figs. 1, 2, and 5) is provided at its bottom with lead away canals or ducts I', which terminate in one or more escape cocks, and so arranged that, should any fine sludge or grit pass between the faces of the plates F and G into the chamber I, it may pass away, through the cock, to any convenient place, a slot above such canal or duct being cut away in the annular plate G. The canal or duct is made sufficiently wide to allow of an altered position of the slot in the annular plate, consequent on its movement forward through wear of the faces of G and F.

We would here have it understood that the annular plate G may be kept forward in its position by any approved mechanism made either elastic, or adjustable, or both; that is to say, either by bolts as H, shown on Figs. 1 and 2, or by an annular pressure water liquid, pneumatic or gaseous chamber as M (Fig. 5), in which latter case the pressure either of water, liquid, air, or gas in the said chamber M automatically keeps forward the ring G², and exerts a sufficient pressure through the medium G', upon the faced ring G.

If it be found desirable, the cock or cocks at the bottom of the duct or ducts I', may be closed, and water or other lubricant supplied to the chamber I, the said cocks being also closed when it is desired to "prime" the pump when starting work and in which case the annular sleeve U is screwed forward, so as to squeeze up the rubber U' and prevent any primage water from escaping.

The faced ring G performs a double function—first, for the purpose, as aforesaid, of preventing any gritty or frictional matter from finding its way out to the bearing surfaces or glands; secondly, for preventing circulation from the main chamber of the pump to the suction or inlet pipe, and vice versa.

We would now call attention to the mechanism illustrated at the suction end of Fig. 1, both ends of Fig. 2, and also in views 3 and 4. In this case an L shaped annular faced plate N is arranged to butt against the end of the pump runner shaft D, and is kept in position by the ring O and packing O'. The ring O is adjusted in its forward movement by two pusher rods P, P, the adjustment action of these latter being set by a plate P' (see Figs. 3 and 4), which said plate is kept in position on the rods P by shoulders and screw nuts P², while a bolt and nut P³ is arranged as shown to adjust the forward pressure by both of the said rods P to the ring O. The annular plate N also fulfills a triple function; that is to say—first, to make a tight joint with the end of the runner A, to prevent the entrance of air from the bearing

Q to the vacuum or flow of fluid inside the runner A; second, to prevent any grit or frictional matter from finding its way from the interior of runner A or suction pipe S into the bearings Q, and, third, to receive and adjust the thrust, caused by the working of the pump, in manners somewhat similar to the annular plate G, hereinbefore described.

R are lubrication cups for supplying the wearing surfaces with any suitable lubricant, but in practice the frictional surfaces at the ends of plates N and G may be found not to require any additional lubricant other than the water or fluid passing through the pump.

The *modus operandi* of our invention is as follows:—Presume that the single pump in Fig. 1 is to be worked. Rotary motion is imparted to the pulley B from any convenient power. The solid shaft C revolves, carrying with it the runner A. A vacuum is produced in A, which causes the fluid (required to be pumped), to enter at the suction pipe S and proceed through the runner in the direction shown by the small arrows. The fluid then finds its way into the casing E and escapes at the outlet E' (Fig. 3). This working of the pump will cause a thrust to be exerted by the runner A in a direction opposite to that shown by the arrows, and the operator will, at his discretion, adjust the position of the ring N (by the medium of the mechanism P, P', P², and P³, Fig. 4), so as to exert just sufficient intimacy between the said plate N and the end of the runner pipe shaft D to prevent any circulation to or ingress from the bearing Q. In like manner the operator will adjust the annular plates G, so as to fulfill the required functions hereinbefore referred to. Should the operator find that any sludge or undesirable matter is finding its way through the annular plates G and F, he will be enabled to judge the necessary adjusting pressure required to be exerted by the screw bolts H, or their equivalent. If it be found that no sludge or gritty matter or fluid passes from the main chamber E, into the small chamber I he may, if he desires, close the cocks at I', and allow a supply of water, oil or other lubricant to fill the chamber I, and surround portions of G and F.

With regard to the annular chamber M, Fig. 5, water or air under pressure may be arranged to fill such said chamber M and act as an alternative to the screws H, on Figs. 1 and 2, in keeping the ring G² forward in its position.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

1. In a centrifugal pump, the combination with the pump frame and the runner, of bearings near both ends of the runners, face plates butting against such bearings and pusher rods P P, plate P' kept in position on said rods by screw nuts P², and bolt and nut P³ for adjusting the forward pressure by said rods P

upon such bearings and face plates, substantially as set forth.

2. In a centrifugal pump, the combination
5 the pump casing containing the discharge outlet, of an adjustable annular plate as G interposed between the interior of such chambered part and the bearing surfaces of the runner, the frame and the runner arranged to provide a reception chamber for liquid in the
10 rear of ring G, and lead away ducts as I' and

a cock trap or shutter for discharging liquid from the reception chamber, substantially as set forth.

Signed this 28th day of November, 1893.

EDWARD SEITZ.

RICHARD PICKUP PARK.

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