(No Model.) 2 Sheets—Sheet 1.

W. O. WEBBER.

CENTRIFUGAL PUMP.

No. 337,216. Patented Mar. 2, 1886.

Fig. 1.

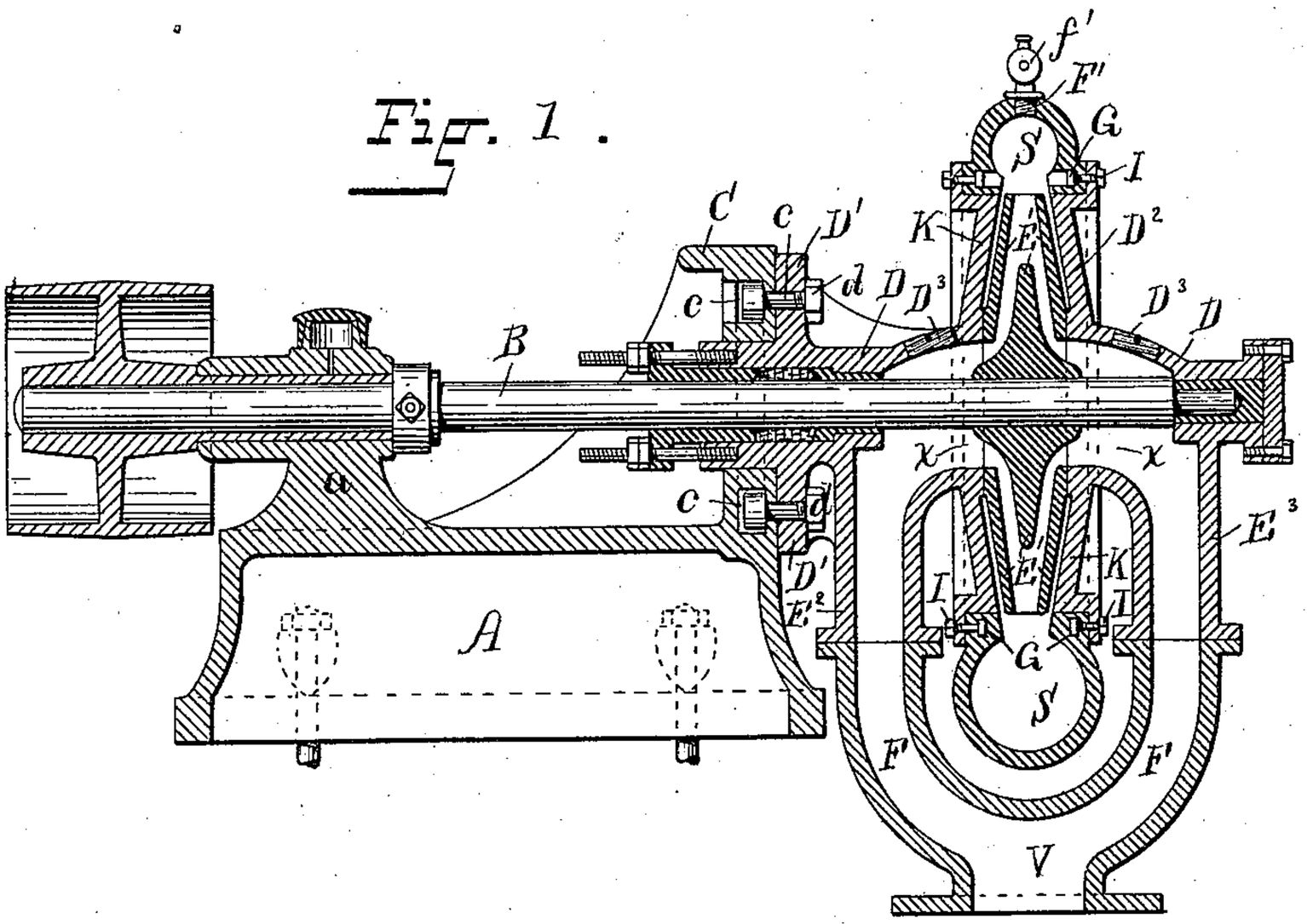
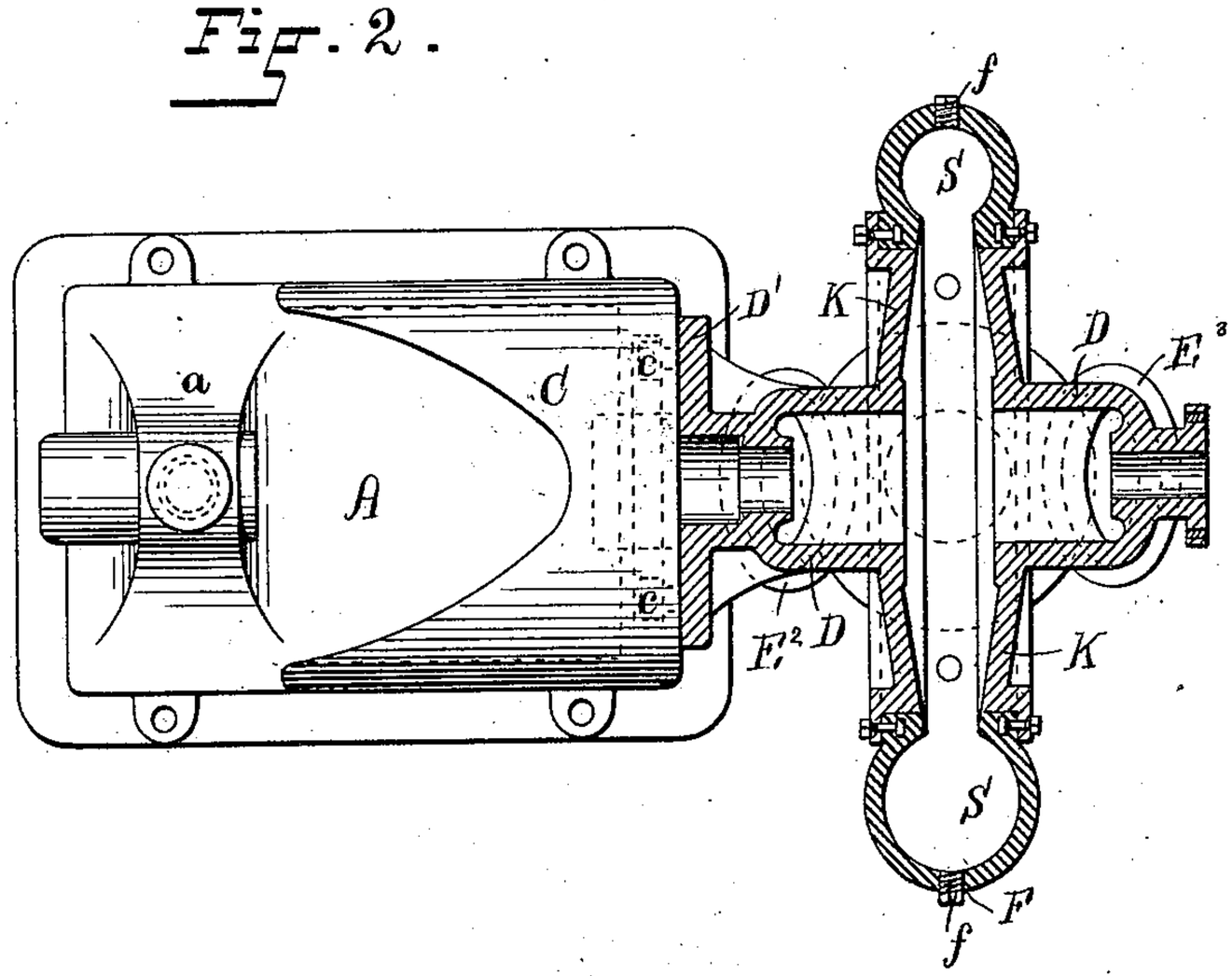


Fig. 2.



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

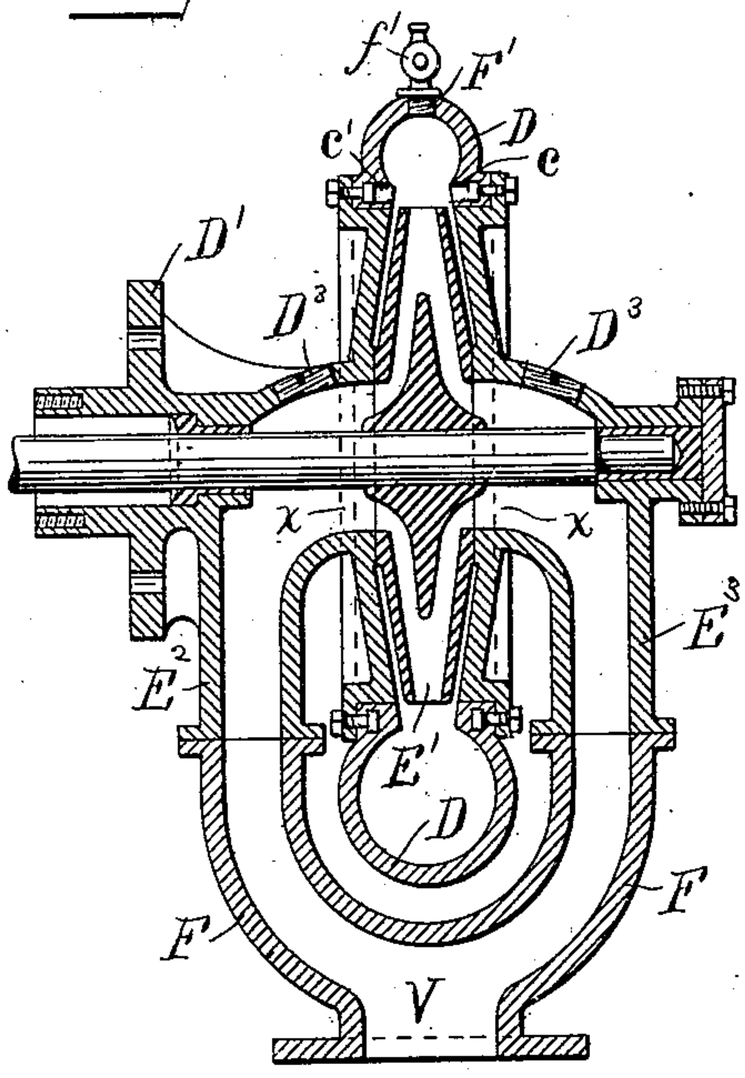


Fig. 5.

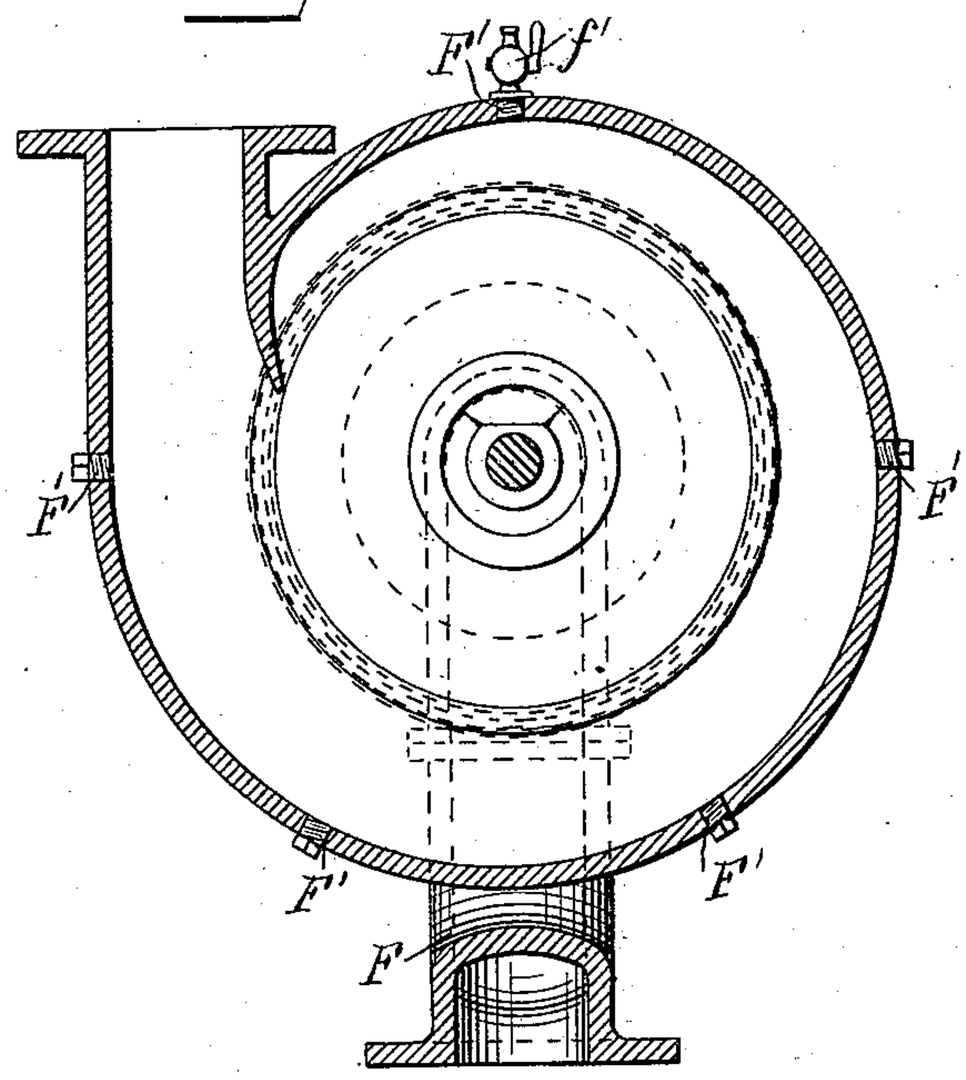


Fig. 6.

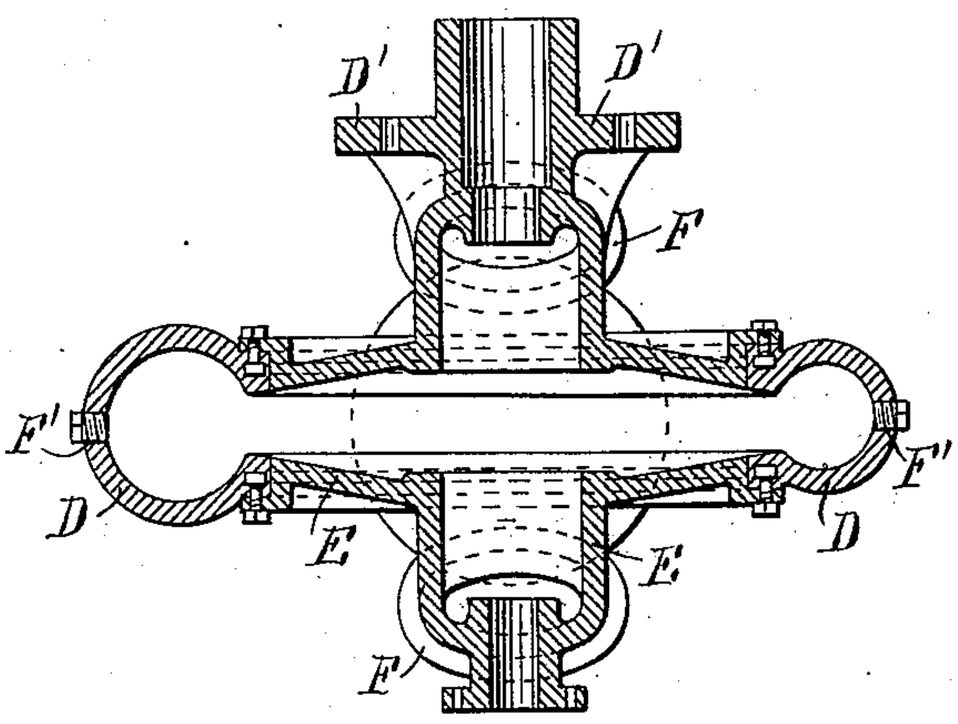
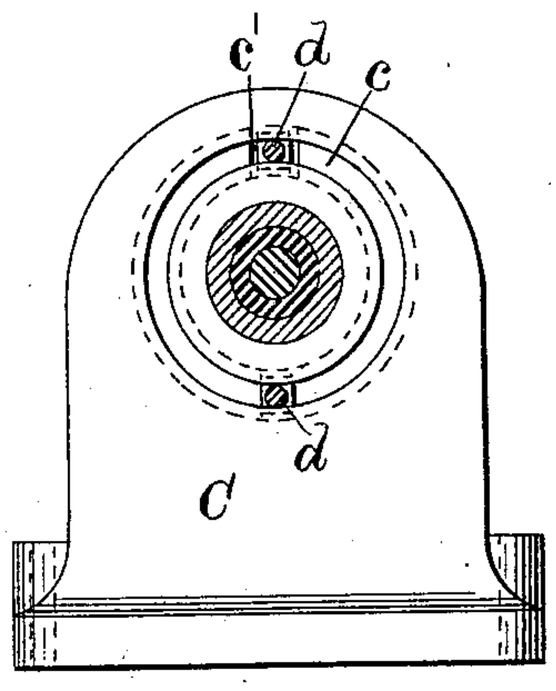


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM O. WEBBER, OF LAWRENCE, MASSACHUSETTS.

CENTRIFUGAL PUMP.

SPECIFICATION forming part of Letters Patent No. 337,216, dated March 2, 1886.

Application filed January 2, 1885. Serial No. 151,744. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM O. WEBBER, of Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Centrifugal Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to the casings of centrifugal pumps, and the objects of my invention are to produce a pump in which the suction and discharge nozzles may be readily varied in position so as to simplify the operation of connecting the pump to its service-connections; also to afford ready access to the interior of the pump for removing or inspecting its internal parts and for removing obstructions; also to avoid the excessive wear produced by lateral movements of the disk by balancing the disk laterally by water-pressure, and, finally, to avoid the evil effects of confined air within the pump by providing means for the ready discharge of such air from the pump-casing.

To the above purposes my invention consists in certain peculiar and novel features of construction and arrangement, as hereinafter described and claimed.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of a pump with my improvements applied. Fig. 2 is a view of the same, partially in plan and partially in horizontal section, with the disk and the driving-connections removed. Fig. 3 is a front elevation of the grooved hood. Fig. 4 is the same view as in Fig. 1, showing my pump detached from the motor-frame. Fig. 5 is a vertical section of the same on a plane at right angles to that of Fig. 4. Fig. 6 is a horizontal cross-section of the same.

In the said drawings, A designates the bed-frame, B the driving-shaft, and *a* the standard, supported upon one end of the bed and carrying one of the bearings for the driving-shaft. These parts may be of any suitable character, as they have only a general relation to my present invention.

C designates a hood, which is supported upon the opposite end of the bed from the standard *a*, and which also carries a bearing of any suitable character for the shaft B. In the face of this hood is formed an annular T-groove *c*.

D designates the casing of the pump, and upon its inner side said casing carries an annular flange, D′, having a number of eyes or holes formed through it for the reception of a corresponding number of screw-bolts, *d*. The heads of these bolts are passed successively through the hole *c′* and thence into the groove *c*, after which the stems of the bolts are passed through the holes in the flange D′, and said bolts are secured by nuts, as shown in Fig. 1. The casing D carries the suction and discharge nozzles, and it will be seen that by simply loosening the nuts the entire casing may be readily revolved, the bolts moving in the groove *c* till the nozzles are brought into proper position for coupling with the service-connections. The annular T-groove G is formed in the casing D, forming the eduction-pipe S, while the bolts I pass through flanges formed on the edges of the disk-casing K of the castings E^2 and E^3, which in turn are secured to the forked hollow casting F. By this construction, when the nuts are loosened, and the eduction-pipe S of the casing D being turned between the castings E^2 E^3, the discharge-nozzle can be varied in position. The flange D′ is formed upon the casting E^2, and is by said flange secured to the hood C, as in Fig. 1. Therefore, when the suction-nozzle is to be varied in position, the castings E^2 E^3 are turned upon the hood C, and the forked casting F, in which the suction-nozzle is formed, is turned with castings E^2 E^3. By this construction the positions of the nozzles may be readily varied with relation to each other, as well as with relation to the entire pump, as was only the case in the construction previously described.

D^2, Fig. 1, designates a cover, which closes a corresponding opening in the outer side of the disk-casing K, and which carries the bearing for the outer end of shaft B. This opening is greater in size than the disk E′, so that when the cover, which is bolted or otherwise secured to the casing, is removed the entire

interior of the pump may be freely inspected, and the disk may be readily removed.

In order to remove any obstructions which may be drawn into the pump, the casing and cover are provided with hand-holes closed by screw-plugs or plates D^3, as shown in Figs. 1 and 4.

As the water or other liquid is drawn in through the suction-nozzle it is divided into two streams, which enter at X X, upon each side of the disk, and thus serves by its pressure to prevent any undue lateral movement of the disk, and consequently prevents the latter from wearing against the sides of the casing. This division of the liquid is produced at the points V in Figs. 1 and 4.

More or less air is drawn into the pump with the liquid, and becoming confined within the casing hinders the proper action of the pump. In order to avoid this difficulty, I form a series of vent-holes, F′, in the rim of the casing, and close all but the uppermost hole by ordinary removable plugs, *f*. The uppermost vent-hole is fitted with a removable pet-cock or other hand-valve, *f′*, by opening which the confined air is allowed to escape and the pump freed. The bolts *d* are placed in the groove *c* by passing them successively through a hole, *c′*, Figs. 1, 3, and 4, of such size as to permit the passage of the bolt-heads. Thus it will be seen that the bolts may be readily placed in and removed out of position through these holes.

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

1. A centrifugal pump having the disk-casing flanges on each side of the disk jointed to the eduction-pipe, which is rotatory circumferentially around said disk-casing, for the purpose described.

2. A centrifugal pump consisting of a disk-casing whose flanges are jointed to a circular shell-like eduction-pipe, which is rotatory circumferentially around said disk-casing, and of a forked induction-pipe spanning said eduction-pipe, as described.

3. The combination, with a pump-case jointed to the hood-frame and turning thereon, of an eduction-pipe jointed to the disk-casing flanges and rotatory circumferentially about said disk-casing, for the purpose described.

4. The combination, with a pump-case jointed to the hood-frame and turning thereon, of an eduction-pipe jointed to the disk-casing flanges and rotatory circumferentially about said disk-casing, and a forked induction-pipe spanning said eduction-pipe and feeding water axially to both sides of the disk, substantially as and for the purpose described.

5. A centrifugal pump having the pump-case jointed to the hood-frame, and the eduction-pipe provided with air-vents and swiveled to the disk-casing provided with a removable plate, and the induction-pipe spanning said eduction-pipe and feeding water axially to the disk, all as and for the purpose described.

6. In a centrifugal pump, the combination, with the pump-case jointed to the hood-frame and having a forked induction-pipe feeding water to both sides of the disk, of the disk-casing provided with a removable plate and having peripherally swiveled thereto an eduction-pipe casing provided with air-vents, substantially as and for the purpose described.

7. The combination, in a centrifugal pump substantially as described, of the two rotatory joints. for the purpose described.

8. The combination, with the disk-casing K, of the eduction-pipe S, having the rotary joint, substantially as and for the purpose described.

9. The combination, with disk-casing K, revolvingly jointed to the eduction-pipe S, substantially as described, of the castings E^2 and E^3, and the forked induction-pipe F, substantially as described.

10. The combination, with the pump-case revolvingly jointed to the hood C, substantially as described, of the pump-case eduction-pipe S, revolvingly jointed to the disk-casing K, for the purpose described.

11. The combination, with the pump-case revolvingly jointed to the hood C, substantially as described, of the pump-case eduction-pipe S, revolvingly jointed to the disk-casing K, and the forked eduction-pipe F, and the castings E^2 and E^3, substantially as described.

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Witnesses:
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