

No. 616,576.

Patented Dec. 27, 1898.

W. JENNINGS.
CENTRIFUGAL PUMP.

(Application filed Sept. 2, 1897.)

(No Model.)

Fig. 1.

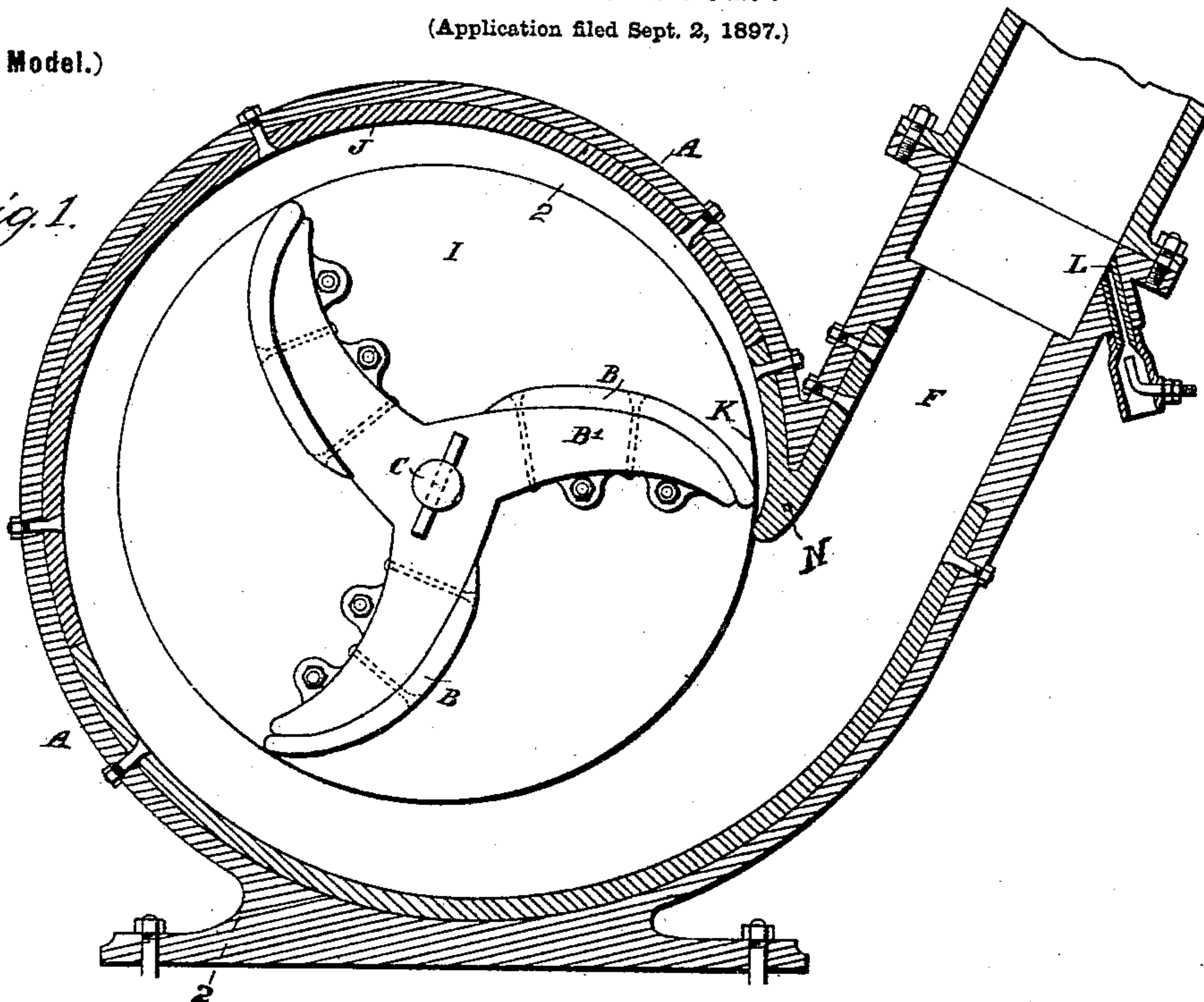
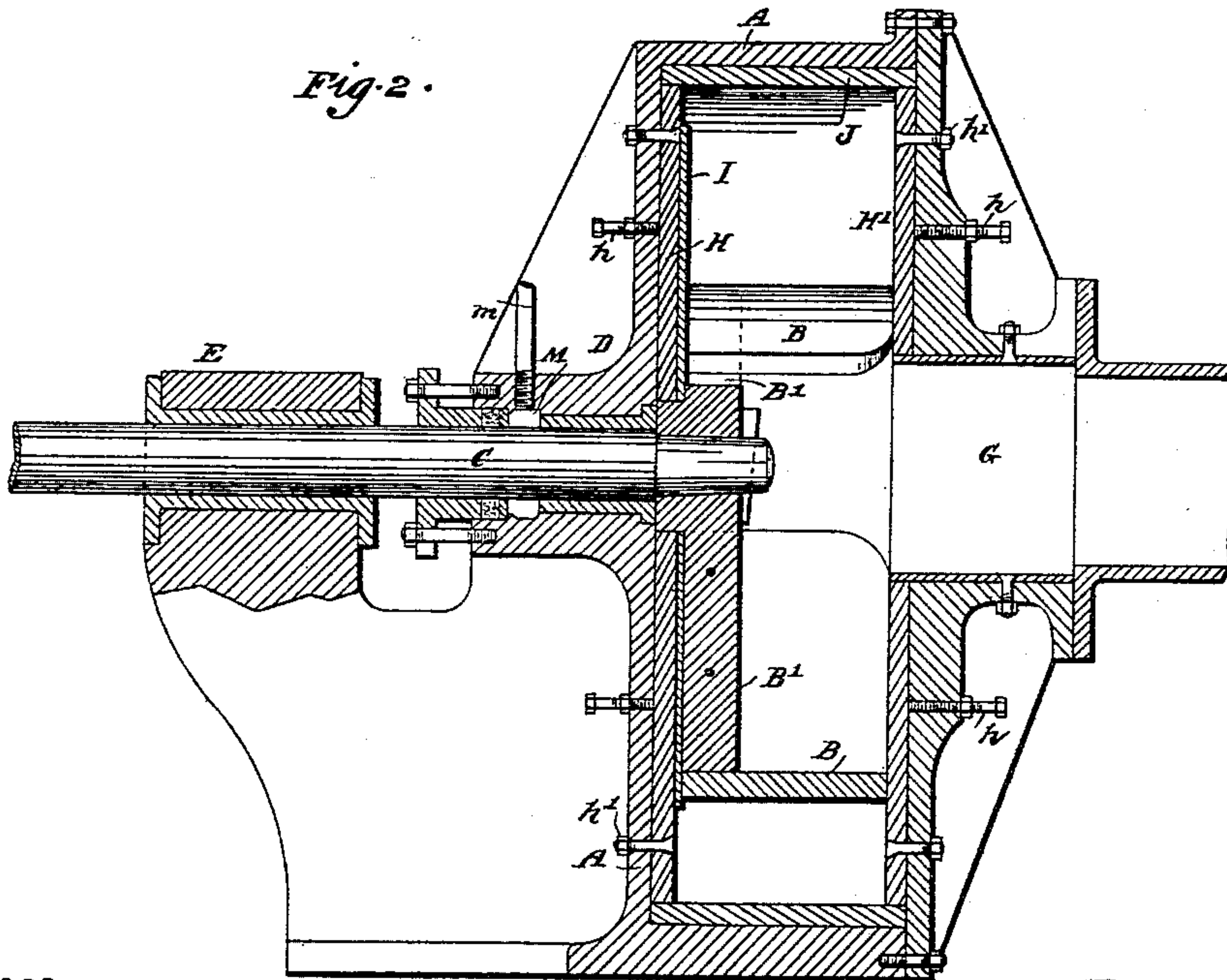


Fig. 2.



Witnesses

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CENTRIFUGAL PUMP.

SPECIFICATION forming part of Letters Patent No. 616,576, dated December 27, 1898.

Application filed September 2, 1897. Serial No. 650,395. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM JENNINGS, a subject of the Queen of Great Britain, residing near Beechworth, in the British Colony of Victoria, have invented an Improved Centrifugal Pump, of which the following is a specification.

The object of this invention is to provide a centrifugal pump which will be especially suitable for raising water, sand, tailings, auriferous earth, or the like, such as is required in certain hydraulic sluicing systems of mining.

A further object in devising this invention has been to increase the durability and efficiency of centrifugal pumps for this purpose.

The improvements, which have been devised in order to remedy certain defects, as well as to improve the efficiency of the pump generally, will be readily understood on reference to the accompanying drawings, wherein—

Figure 1 is a vertical central section of a centrifugal pump constructed according to this invention, while Fig. 2 is a transverse section thereof on line 2 2, Fig. 1.

The same letters of reference indicate the same parts in both figures.

A represents the casing of this improved centrifugal pump. It is made of a width sufficient to contain the blades B of the runner, together with certain adjustable liner-plates, hereinafter described, and its contour is in the form of a parabola, as illustrated in Fig. 1. The spindle C of the runner is mounted in suitable bearings D E, so that the periphery of the runner comes close up to that part of the casing which is next the delivery-opening F. In other words, said runner is not mounted centrally within the casing, but eccentrically, the inlet-opening G being correspondingly arranged, so that it is opposite the center of the runner, and is therefore eccentric as regards the casing.

In order to maintain a sufficiently-tight joint between the sides of the casing A and the sides of the blades B, circular liners H H' are fitted between them, as illustrated in Fig. 2, and said liners are arranged so that they

can be adjusted nearer to the sides of said blades as they become worn. This adjustment may be conveniently effected by set-screws h and bolts h', said bolts being slacked back slightly and the set-screws tightened up whenever it is required to adjust said runners.

Upon the back of the runner a thin liner I may be secured, so that the material passing into the pump will not meet a stationary surface immediately upon its entrance, but will be whirled around and will come in contact with a surface traveling in the same direction, and therefore the amount of wear will be reduced below what it otherwise would be. This plate is, however, only a liner and is merely intended for the purpose just described and not for closing in the back of the runner. No such plates are used on the front of the runners—that is, said fronts are left entirely open—and it has been found in practice that such solid open runners are not only lighter but work more satisfactorily than the closed-in hollow box-runners.

The blades B of the runner are carried upon arms B', which are keyed or otherwise secured upon the spindle C, and said arms and blades are curved rearwardly to a gradually-increasing extent as they near the periphery, so that the wearing effect of the material will be evenly distributed over the surface of the blade, and at the same time the material being acted upon will be thrown outward as it is carried around toward the delivery-port, and thus a centrifugal (in contradistinction to centripetal) action is assured.

The periphery of the casing is fitted with a liner J, which may be made in sections for convenience of application and which takes up the wear caused by the material passing around inside the pump, thus saving the casing, which does not require to be renewed so often, and in order to reduce the wear on this liner the casing is made of such a shape, as illustrated in Fig. 1, that a space is provided a short distance from the nose-piece of the delivery-port F, as indicated at K in Fig. 1, which space by being filled with material serves as a kind of cushion and being slightly beyond the reach of the blades B remains in

a more quiescent state, and consequently does not so injuriously affect the liner, which by this simple means is made to last much longer, and, moreover, the risk of pieces of iron becoming jammed is materially reduced.

The nose-piece N is formed by continuing the lining J around the angle formed by the junction of the delivery-pipe F with the wall of the casing A and extending the lining for a short distance up in said delivery-pipe. Said nose-piece is therefore composed of an integral section of lining and is removable, as shown.

The delivery-pipe of this improved centrifugal pump is made of larger diameter than the inlet-pipe, as illustrated in Fig. 1, and to still further reduce the friction of the material passing up this pipe an air-injector L is inserted just above the delivery-port. This injector may be constructed as illustrated in Fig. 1 and be operated by means of a jet of steam, or it may consist merely of a pipe leading from a compressed-air-storage reservoir or other source of compressed air, the effect of which, mingling with the material being raised, will lessen the friction against the sides of the pipe, and, moreover, by aerating such

material the load against the pump will be considerably reduced.

To prevent grit passing into the bearings, they are made with chambers M, into which water under pressure is fed through a pipe *m* or otherwise from any convenient source of supply.

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

In a centrifugal pump, the combination with the casing and a runner eccentrically mounted therein and of the delivery-pipe, of an adjustable liner interposed between the wall of said casing and the sides of the runner, a lining secured around the inner periphery of said casing and a removable nose-piece formed by continuing a section of said lining around the angle formed by the junction of the delivery-pipe with the wall of the casing and extending said lining up into the delivery-pipe for a suitable distance, substantially as described.

WILLIAM JENNINGS.

Witnesses:

EDWARD WATERS,

EDWARD WATERS, Jr.