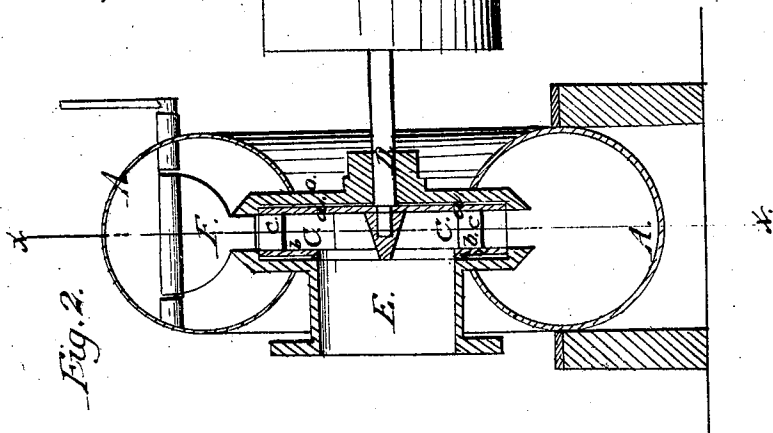


*H. A. Duc. Jr.,*

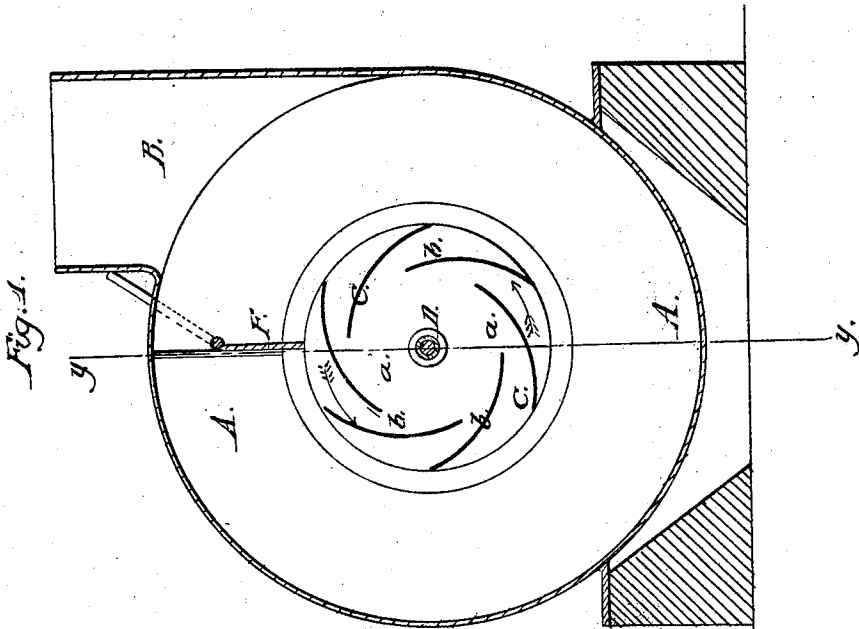
*Rotary Pumps.*

*No. 85,802.*

*Patented Jan. 12, 1869.*



*Fig. 2.*



*Fig. 1.*

*Witnesses:*  
*W. C. Aslakette*  
*Wm. A. Morgan*

*Inventor:*  
*H. A. Duc. Jr.*  
*per Munnif Co.*  
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# United States Patent Office.

H. A. DUC, JR., OF CHARLESTON, SOUTH CAROLINA.

Letters Patent No. 85,802, dated January 12, 1869.

## IMPROVEMENT IN CENTRIFUGAL PUMPS.

The Schedule referred to in these Letters Patent and making part of the same.

### To all whom it may concern :

Be it known that I, H. A. DUC, JR., of Charleston, in the district of Charleston, and State of South Carolina, have invented a new and improved Centrifugal Pump; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

Figure 1 represents a vertical sectional view of my improved centrifugal pump, taken on the plane of the line *x x*, fig. 2.

Figure 2 is a vertical section of the same, taken on the plane of the line *y y*, fig. 1.

Similar letters of reference indicate corresponding parts.

My invention consists in the arrangement of a gate across the annular chamber of a centrifugal pump, by means of which said pump may be formed without the employment of a foot-valve.

A, in the drawing, represents the annular case or shell of a centrifugal pump, made of suitable material, and of suitable size.

B is the eduction-pipe, through which the liquid is discharged.

E is the induction-pipe.

C is the wheel, mounted on a horizontal shaft, D, that passes centrally through the case, as indicated in fig. 2.

The wheel consists of one solid head, *a*, of an annular head, *b*, and of a series of buckets, *c c*, secured between the heads in the ordinary or in suitable manner.

The buckets are so set that the rear end of one bucket is above and overlaps the front end of the next, as shown, so that when the wheel revolves in the direction of the arrow, shown in fig. 1, a vacuum will be formed behind each bucket, which will cause the air to rush out between the buckets into the induction-pipe E.

F represents an oscillating or sliding gate, fitted across the annular channel that is formed between the wheel and the outer side of the case, said gate preventing the water from being carried around with and by the wheel, and from thus circulating in the case.

If the water should be allowed to circulate, the vacuum formed behind each bucket would not be so large as to allow the rapid discharge of the air, while with the gate the vacuum is enlarged and the discharge facilitated.

The gate should be oscillating, or sliding, or otherwise so arranged that it can be taken out of the way, so as to admit the passage of obstructions that may enter the pump.

This pump need not be primed before it is set in motion, as it will commence discharging as soon as the water enters the case in which the wheel revolves.

I claim as new, and desire to secure by Letters Patent—

A gate, arranged across the annular chamber of a centrifugal pump, by which it is primed, without the employment of a foot-valve, substantially as set forth.

H. A. DUC, JR.

Witnesses:

WM. F. McNAMARA,  
ALEX. F. ROBERTS.