

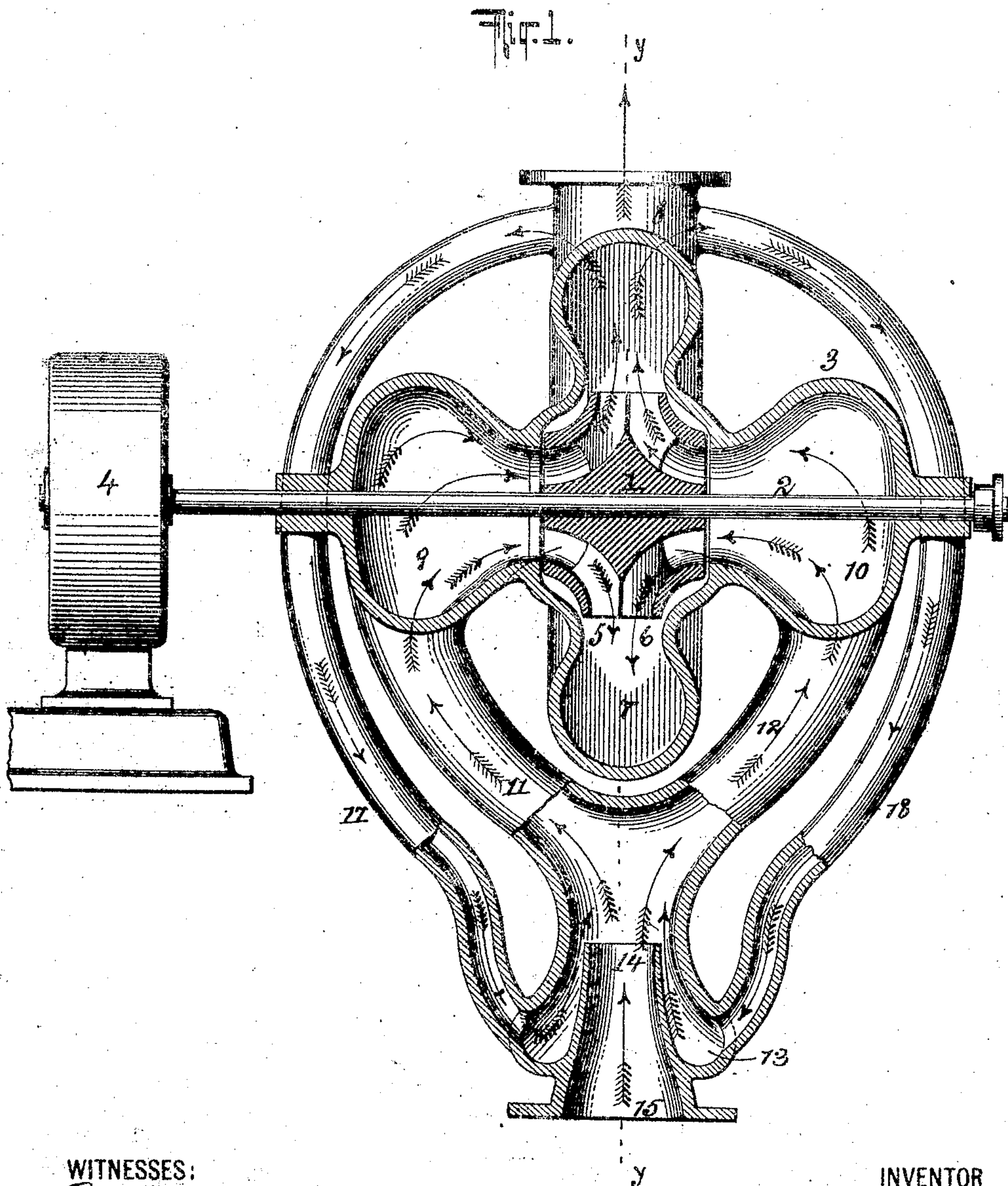
No. 819,273.

PATENTED MAY 1, 1906.

A. E. GUY.  
ROTARY FLUID IMPELLING DEVICE.

APPLICATION FILED APR. 3, 1905.

2 SHEETS—SHEET 1.



WITNESSES:  
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*Edwin H. Dietrich*

INVENTOR  
*Albert E. Guy*  
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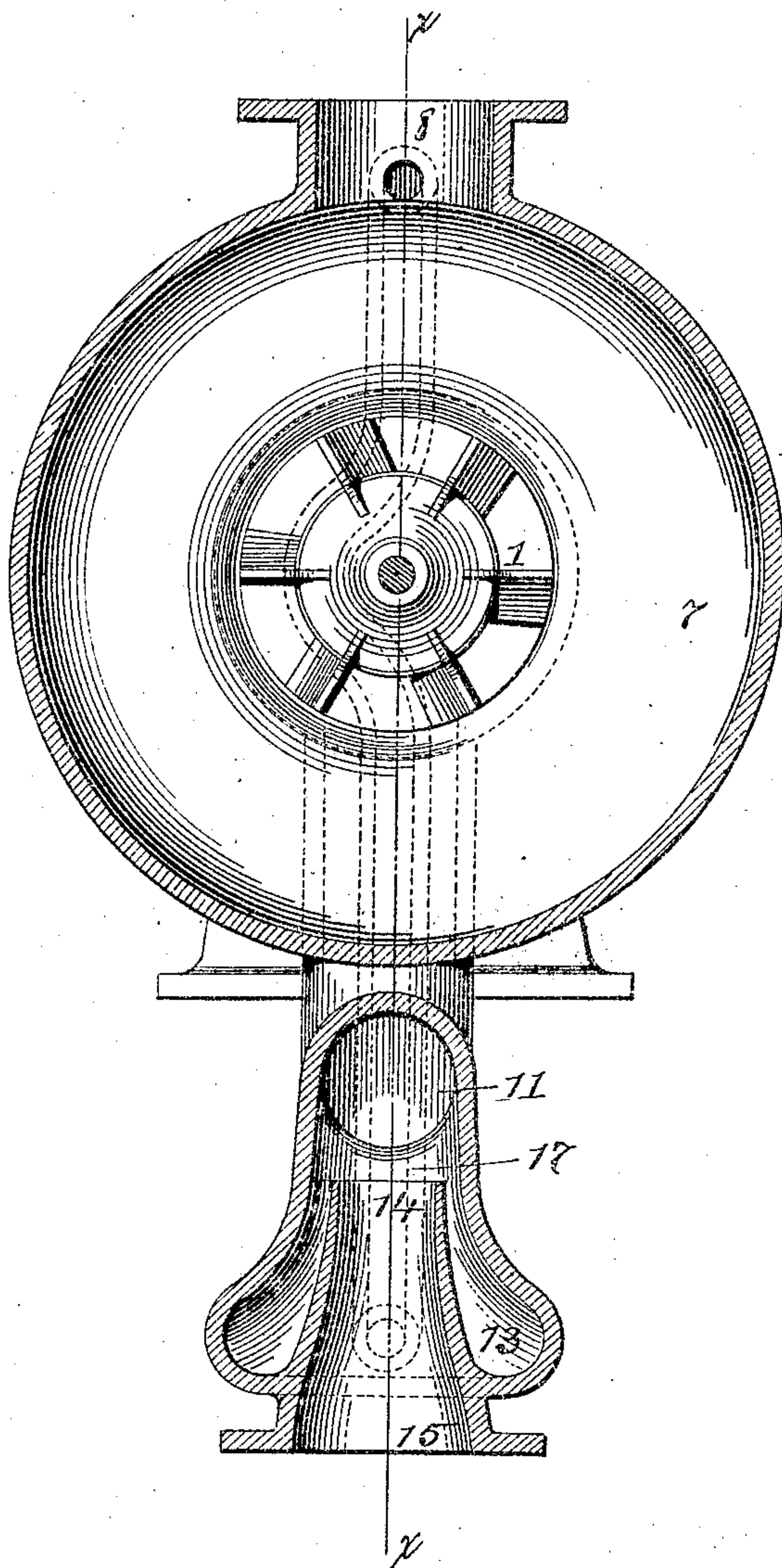
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Fig. 2.



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# UNITED STATES PATENT OFFICE.

ALBERT E. GUY, OF TRENTON, NEW JERSEY, ASSIGNOR TO DELAVAL  
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## ROTARY FLUID-IMPELLING DEVICE.

No. 819,273.

Specification of Letters Patent.

Patented May 1, 1906.

Application filed April 3, 1905. Serial No. 253,444.

*To all whom it may concern:*

Be it known that I, ALBERT E. GUY, of Trenton, Mercer county, New Jersey, have invented a new and useful Improvement in Rotary Fluid-impelling Devices, of which the following is a specification.

High-speed rotary fluid-impelling devices, such as centrifugal pumps, frequently fail to work properly because the velocity of the rotary impeller is so great that suction becomes imperfect. If, however, the incoming liquid be brought to higher initial pressure, this difficulty is overcome. I accomplish this by combining with the impelling device an injector disposed on the suction side thereof and acting upon the incoming liquid to increase its pressure, the said injector being actuated by a portion of the flow delivered by the impelling device. In this way I make it possible to drive a centrifugal pump at high speed by a steam-turbine, for example, and thus obtain a delivery at high pressure, which, for purposes of boiler-feed and other special uses, is often very desirable.

My invention consists in the method of increasing the initial pressure of the incoming flow and an apparatus wherein said method is embodied, as more particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a section of a centrifugal pump embodying my invention on the line *xx* of Fig. 2. Fig. 2 is a section on the line *yy* of Fig. 1.

Similar numbers of reference indicate like parts.

1 is the impeller-wheel. The shaft 2, on which said wheel is carried, is journaled in the walls of the casing 3 and is actuated by any suitable motor, represented at 4. The impeller-wheel is here duplex and has two sets of blades 5 6, so that when said wheel is rotated, the liquid is drawn in at both ends of the wheel and delivered at its middle portion, as shown by the arrows. The pump-casing 3 has an annular chamber 7 surrounding the wheel and communicating with delivery-pipe 8, and also two side chambers 9 10, which communicate with branch pipes 11 and 12. These branch pipes lead from an

annular chamber 13, which surrounds the nozzle end 14 of the suction-pipe 15. Said chamber 13 connects by pipes 17 18 with the delivery-pipe 8.

The nozzle end 14 of suction-pipe 15, with the annular chamber 13, forms an injector in which the kinetic energy of a portion of the outgoing liquid is imparted to the incoming liquid—that is to say, the portion of liquid flow which passes from the delivery-pipe 8 through the pipes 17 18 to the annular chamber 13 and which escapes from said annular chamber through the constricted space surrounding the nozzle end 14 of the suction-pipe 15 imparts its kinetic energy to the flow passing through said nozzle, and thus increases the pressure of the liquid which proceeds to the impeller-wheel.

I claim—

1. The method of increasing the initial pressure of a fluid entering a flow-producing apparatus by admitting to the said entering flow a portion of the flow delivered by said apparatus.

2. The method of augmenting the normal flow-producing capacity of a fluid-impelling device operating at a speed too high for efficient impulsion, by employing a portion of the kinetic energy of flow produced by said device to increase the kinetic energy of flow entering said device.

3. A pump and means actuated by a portion of the liquid delivered thereby for increasing the pressure of the liquid on the suction side of said pump.

4. A pump, and an injector actuated by a portion of the liquid delivered by said pump, and acting upon the liquid on the suction side of said pump.

5. In a pump, an impeller-wheel and an injector actuated by a portion of the liquid delivered by said wheel and constructed to increase the pressure of the liquid on the suction side of said wheel.

6. The combination of a fluid-impelling device, a supply-conduit therefor, and means for increasing the kinetic energy of the supply-current actuated by the flow delivered by said device.

7. The combination of a fluid-impelling device, a supply-conduit therefor, and means within said conduit for increasing the kinetic energy of the supply-current actuated by the  
5 flow delivered by said device.

8. The combination with a fluid-impelling device, a supply-pipe having a constricted nozzle, an annular chamber surrounding said nozzle and pipes leading respectively from

said annular chamber to the delivery and to the inlet of said device.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALBERT E. GUY.

Witnesses:

PARK BENJAMIN, Jr.,  
JANET A. GLENDUINING.