

No. 651,400.

Patented June 12, 1900.

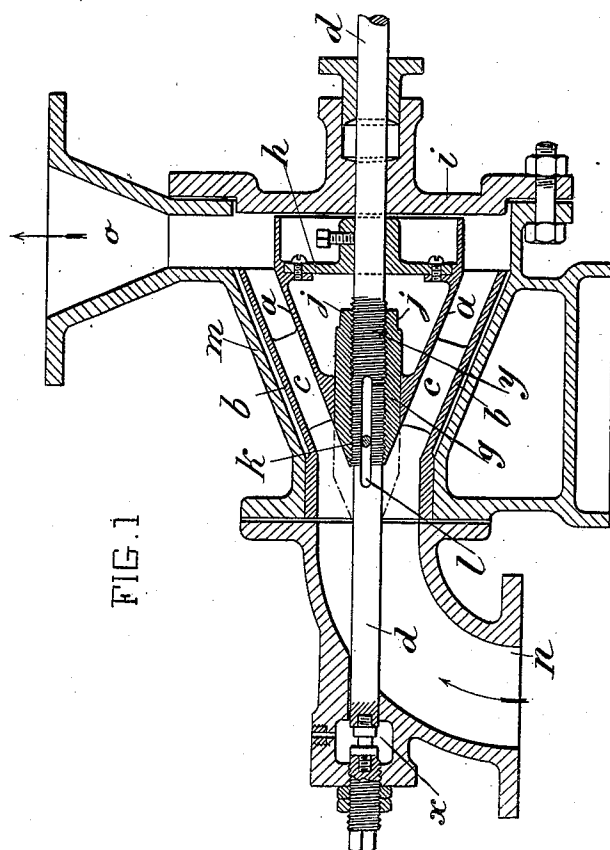
G. TROUVÉ & L. F. BELLOT.

ROTARY PUMP.

(Application filed Apr. 25, 1899.)

(No Model.)

6 Sheets—Sheet 1.



Witnesses

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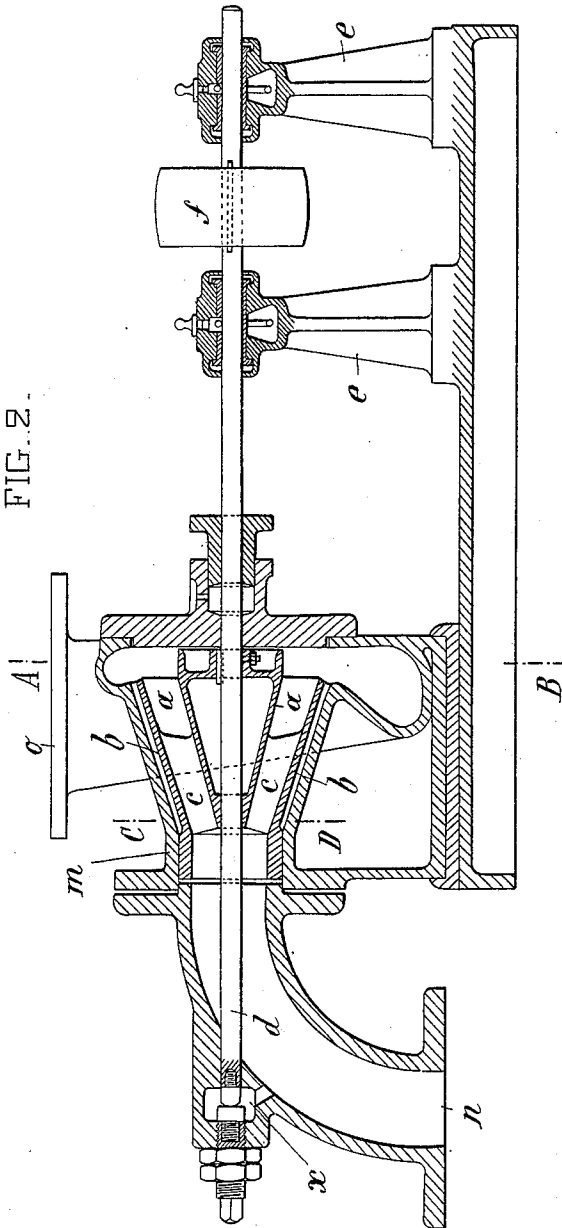
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6 Sheets—Sheet 2.

FIG. 2.



Witnesses

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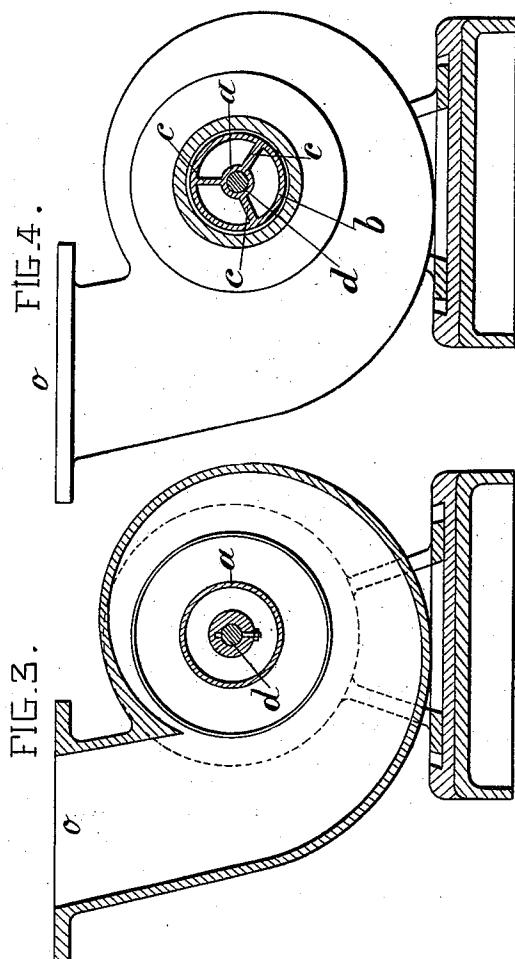
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6 Sheets—Sheet 3.



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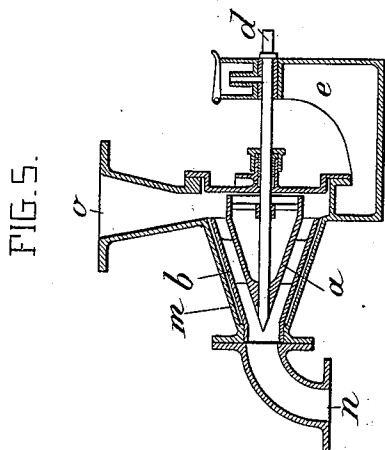
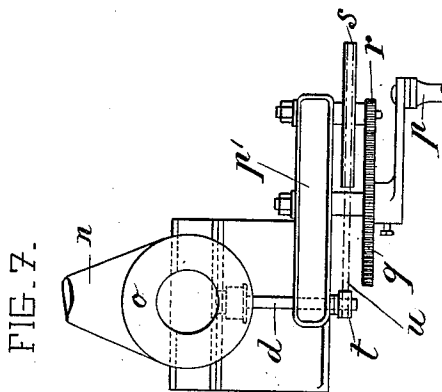
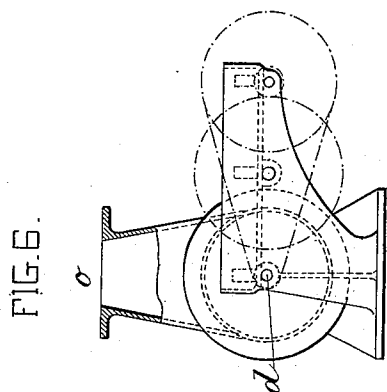
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6 Sheets—Sheet 4.



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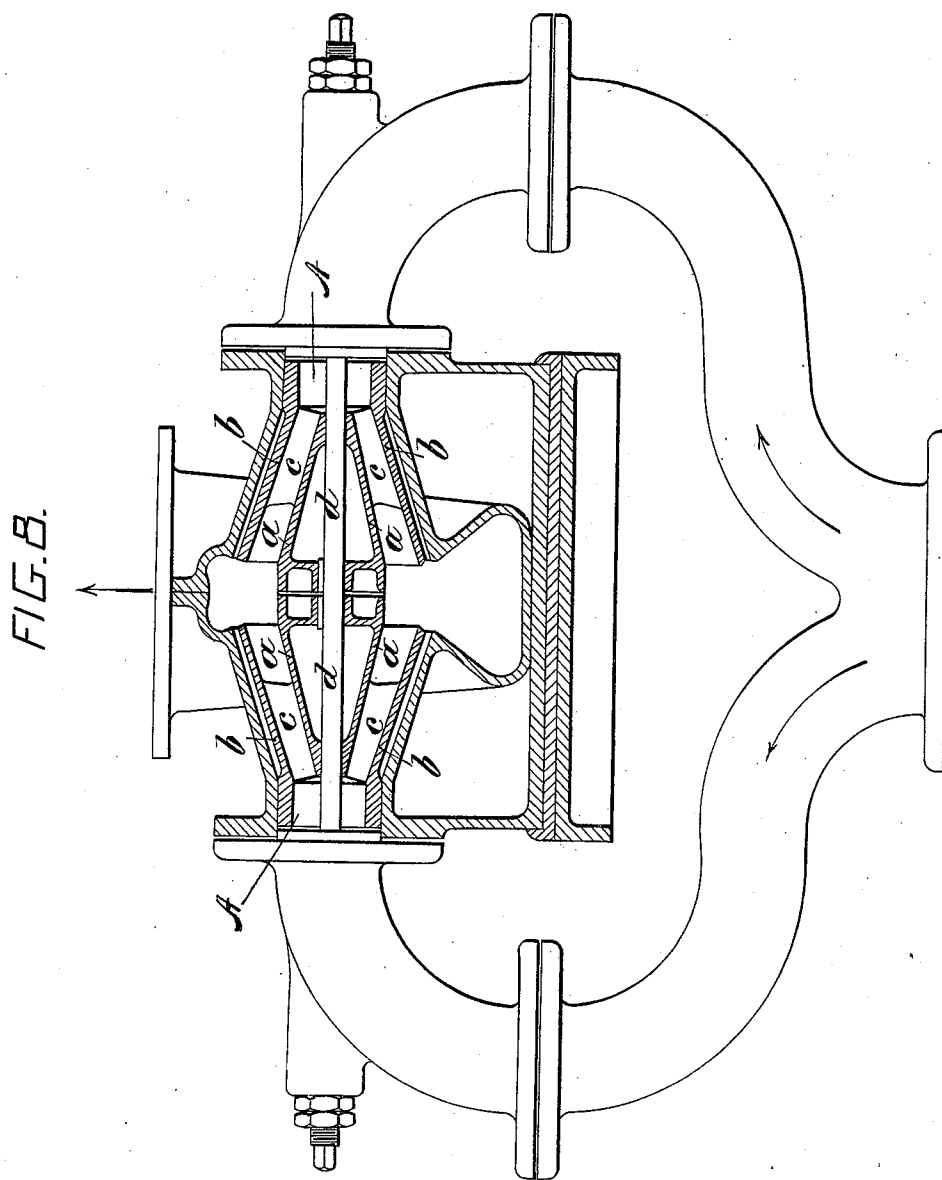
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8 Sheets—Sheet 5.



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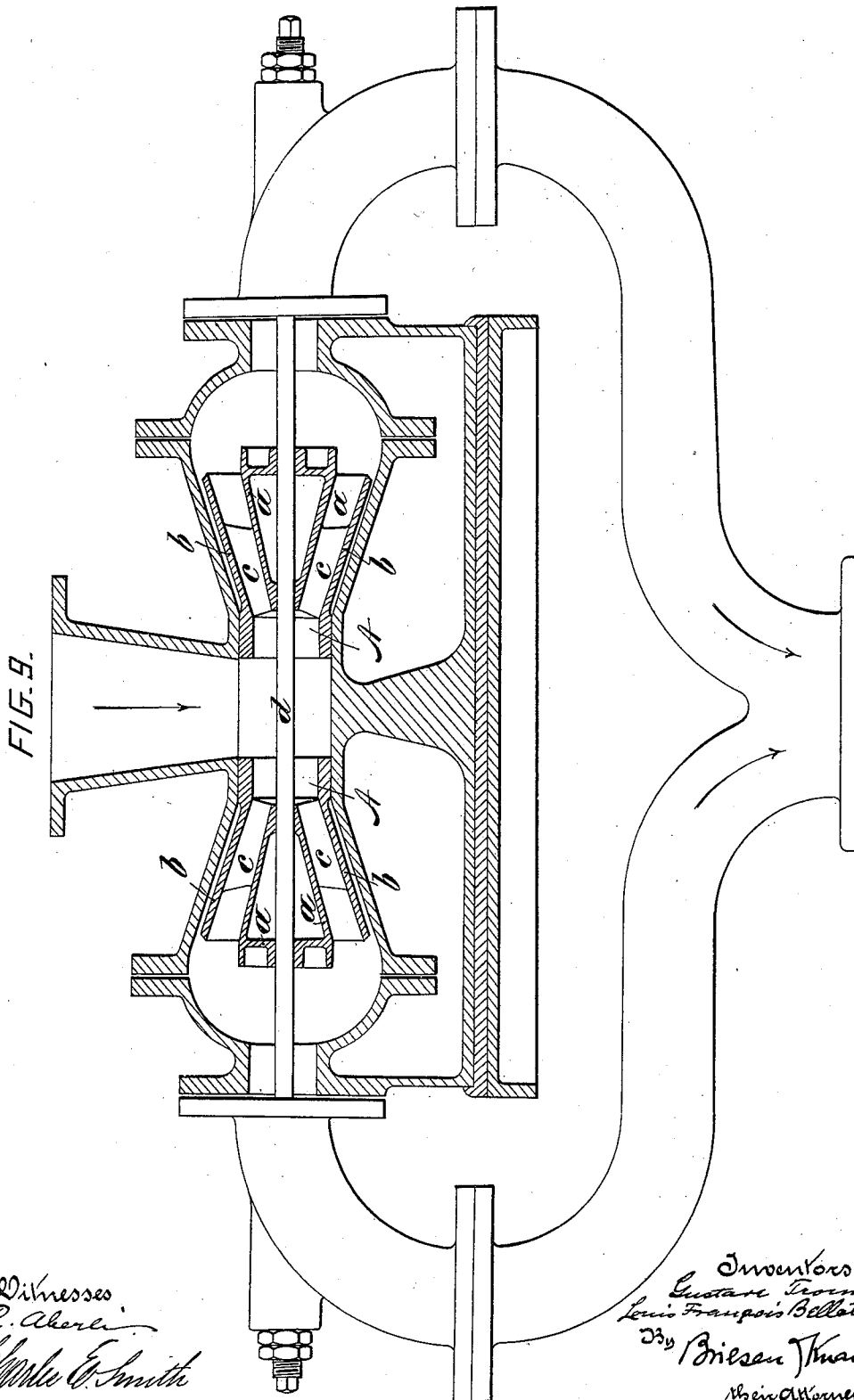
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ROTARY PUMP.

(Application filed Apr. 25, 1899.)

(No Model.)

6 Sheets—Sheet 6.



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UNITED STATES PATENT OFFICE.

GUSTAVE TROUVÉ AND LOUIS FRANÇOIS BELLOT, OF PARIS, FRANCE.

ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 651,400, dated June 12, 1900.

Application filed April 25, 1899. Serial No. 714,357. (No model.)

To all whom it may concern:

Be it known that we, GUSTAVE TROUVÉ, electrical engineer, of 14 Rue Vivienne, and LOUIS FRANÇOIS BELLOT, civil engineer, of 11 Avenue Parmentier, Paris, France, have invented an Improved Rotary Pump, of which the following is a full, clear, and exact description.

This invention relates to rotary pumps; and said invention is substantially characterized by two cones arranged one inside the other and connected by ribs, so as to leave a space between them to permit the liquid sucked up by the rotary motion of both cones to pass into a casing of the same form, which rotary motion is produced by the action of a shaft passing through the device and to which motion is transmitted in any suitable manner. The water arriving at the smallest base of the double cone is carried forward into the space and is then driven to a height depending upon the rotary speed of said apparatus. When it is not desired to vary the speed, the delivery is regulated by means of an appliance for varying the opening between the two cones.

The invention consists in the novel arrangement and combination of parts hereinafter described and claimed.

Our apparatus may be conveniently applied to lifting water in wells and in mine-shafts and to works of civil and military engineering. It may also be used as a draining or irrigating pump for agricultural purposes and as a pump for transfusing wine, beer, &c. Furthermore, our apparatus may be advantageously used for propelling ships by sucking up water at the bow and delivering it at the stern.

We will now describe our invention with reference to the accompanying drawings, in which—

Figure 1 shows in vertical section our arrangement of pump for a large delivery. Fig. 2 is a vertical section of another form of pump with outlet-passage in spiral form. Fig. 3 is a transverse sectional view of the same, drawn on the line A B of Fig. 2. Fig. 4 is a like view of the same, drawn on the line C D of Fig. 2. Fig. 5 shows in vertical section a pump for a smaller delivery. Fig. 6 shows an end view of the same pump. Fig. 7 is a corresponding plan thereof. Fig. 8 is a ver-

tical sectional view of a double pump receiving the water at each side and discharging from one central pipe. Fig. 9 is a vertical sectional view of a double pump, showing a reverse arrangement from that illustrated in Fig. 8 in that it receives the fluid in one central pipe and discharges into a pipe at each side.

In the several figures the same letters of reference denote like parts.

As shown in the drawings, our arrangement of pump is characterized by an impeller made up of two substantially-conoidal shells *a b*, with rectilinear generatrices, which may be convergent, divergent, or curvilinear. Said conoidal shells are connected by rectilinear or helical ribs *c*—three, for instance. The central conoidal shell *a* is keyed upon a long shaft *d*, carried by bearings *e* and operated by a pulley *f*. A stop-piece or stop-bearing *x* counterbalances the reactions exerted by the liquid in a direction parallel to the axis. Inside the central cone on conoidal shell there is a suitable adjustable plug or stopper *g*, forming a screw-nut, which may be shifted or adjusted upon the threaded part *y* of the shaft when it is intended to increase or lessen the sectional area of the orifice between the cones or conoidal shells *a* and *b*. In order to adjust the stopper *g*, it is merely necessary to remove the heads *h* and *i*, when access is given to the squared portion *j* of the stopper, which enables it to be adjusted along the shaft by turning the stopper on its coöperating screw-thread with the aid of a suitable wrench. After having been regulated the stopper is fixed in the adjusted position by means of a screw *k*, passing through a hole *l* in the shaft *d*. The two cones *a b* are inclosed in a casing *m*, having a sucking-sleeve *n* and an outlet-orifice *o*. Said outlet *o* may have symmetrical vertical walls, as shown in Figs. 1, 5, 6, and 7, or a wall of spiral form, as shown in Figs. 2, 3, and 4.

The arrangement provided with a stopper, as in Fig. 1, enables the operator to vary at will the delivery of our pump without altering the rotation speed; but we may also construct pumps without a stopper, as shown in Fig. 2. The shaft *d* being started through the pulley *f*, for example, a sucking action takes place through the orifice *n* by virtue of

the two coupled cones moving around with said shaft, and the stream of liquid passes through the space left between the said cones and passes into the outlet-orifice *o*. In case
 5 of a small delivery the shaft *d* may be operated by hand through a crank *p*, gears *q* *r*, a wheel *s*, and a pinion *t*, upon which passes the chain *u*, the same being indicated in dotted lines. A common oil-reservoir *p'* is provided for lubricating all these rotating parts
 10 in order to avoid undue friction or abnormal wear of the parts.

Our arrangement of pump may be double and the two large bases of the cones connected.
 15 In such case the sucking up would take place laterally and the only delivery-orifice would be at the center of the pump, as indicated in Fig. 8 of the drawings.

We may also double our pump in a reverse manner by connecting together the two smallest bases of the cones, as indicated in Fig. 9
 20 of the drawings. In such case there will be only one sucking-orifice, while two outlet-orifices will be laterally arranged.

25 The forms, details, accessories, materials, and sizes of our arrangement of pump may of course vary without altering in any way the principle of our invention.

Having described our invention, what we
 30 claim, and desire to secure by Letters Patent, is—

1. In a rotary pump, the combination of two cones connected together by means of ribs, a fixed conical casing in which said cones
 35 are carried, and a stopper which may be shifted upon the driving-shaft in order to vary the sectional area of the liquid-admission orifice between the cones and thereby regulate at will the delivery of the pump without
 40 changing the speed of rotation of the parts.

2. In a rotary pump the combination of a conoidal outer casing, a conoidal impeller rotatable therein, said impeller having a liquid-
 45 admission orifice therein, an adjustable plug rotatable with the impeller, means exterior of the liquid-channels of the pump for adjusting said plug in the liquid-admission orifice of the impeller in order to vary the sectional
 50 area of said orifice and thereby vary the delivery of the pump without changing the speed of rotation of the parts.

The foregoing specification of our improved rotary pump signed by us this 7th day of
 55 April, 1899.

GUSTAVE TROUVÉ.
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Witnesses:

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