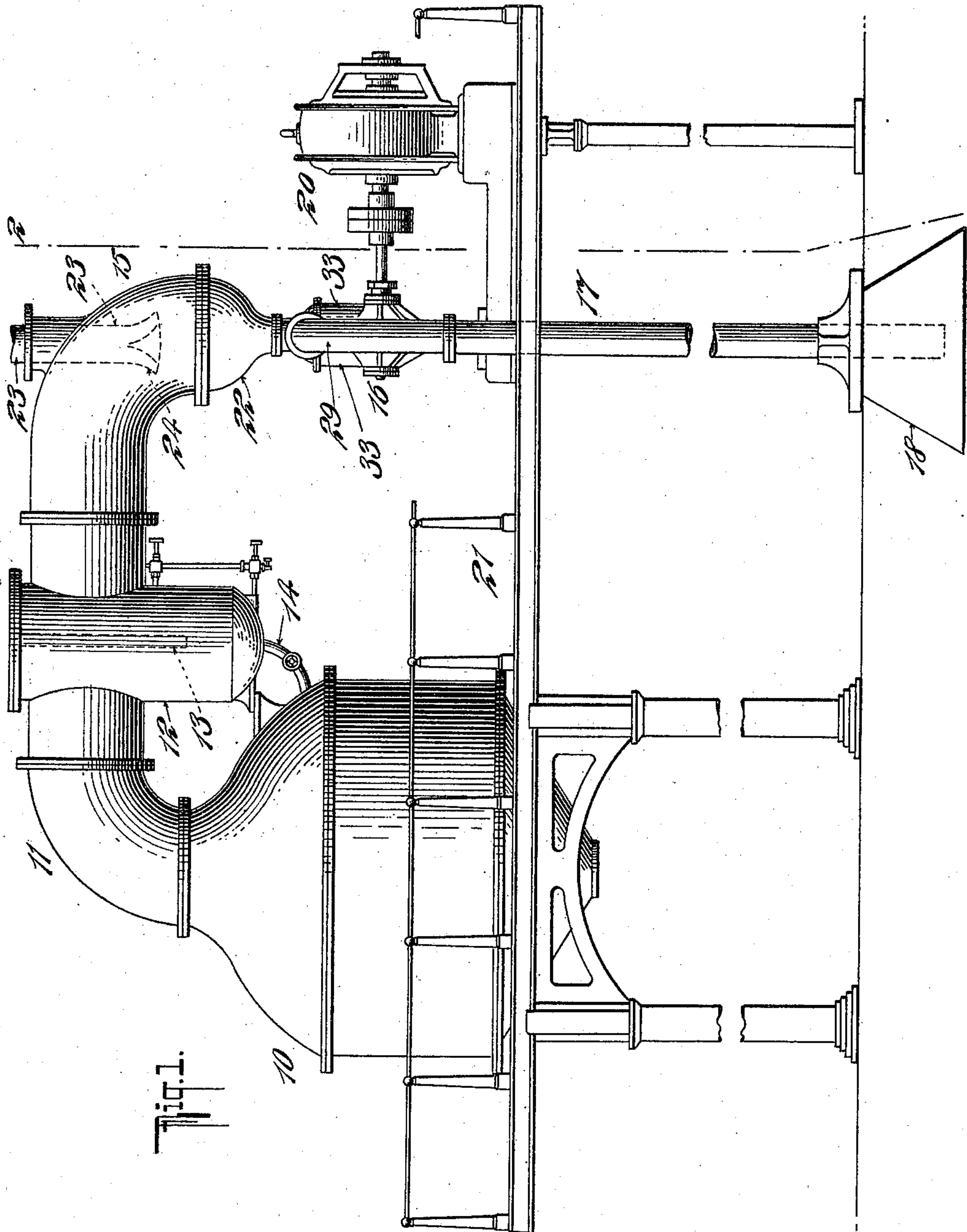


J. A. GROSHON.
VACUUM PAN APPARATUS.
APPLICATION FILED MAY 14, 1909.

963,759.

Patented July 12, 1910.

3 SHEETS—SHEET 1.



WITNESSES
Julius Henry
Arthur Marion

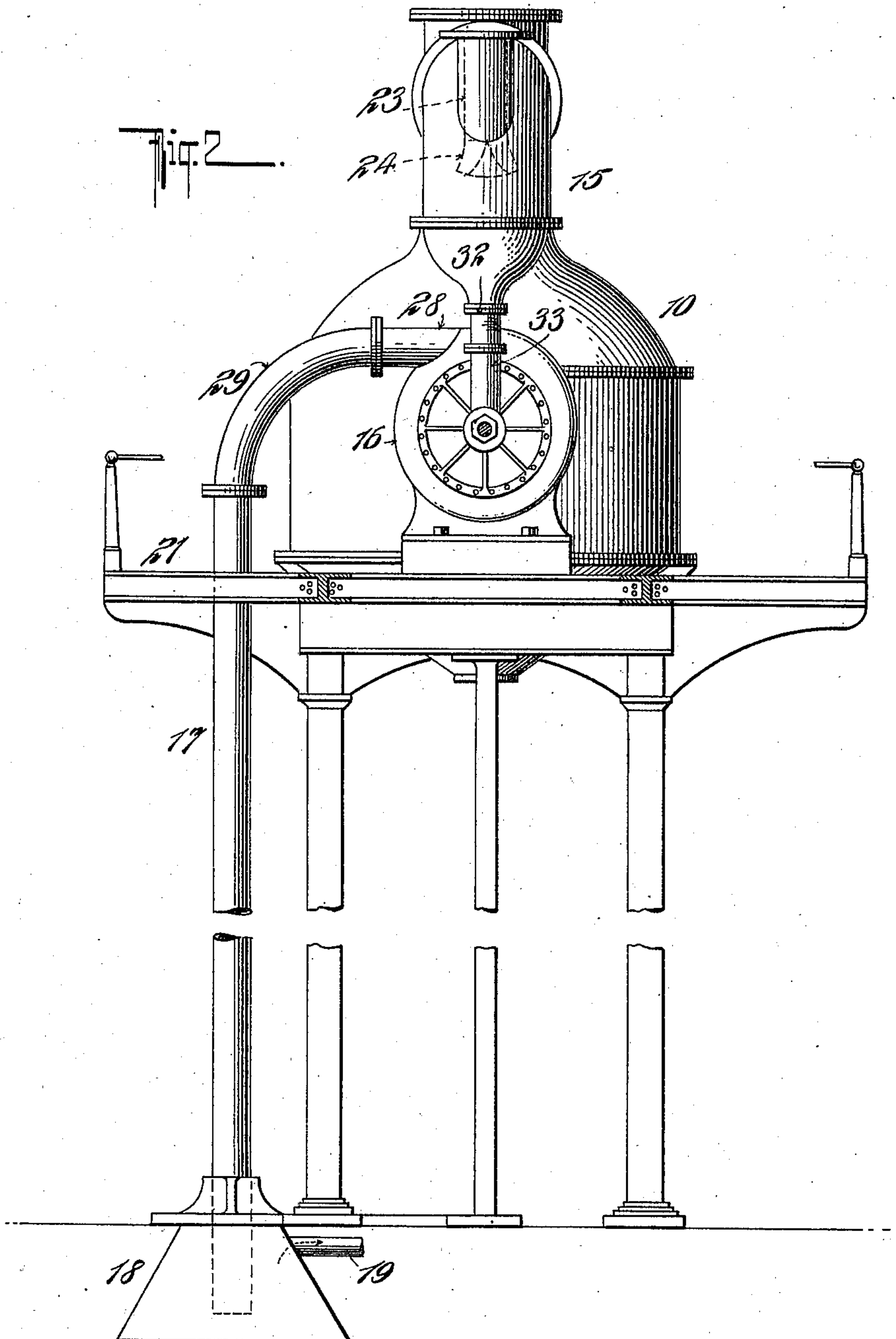
INVENTOR
John A. Groshon
BY
Chas. C. Gill
ATTORNEY

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3 SHEETS—SHEET 2.



WITNESSES
Julius H. Smith
Arthur Marion.

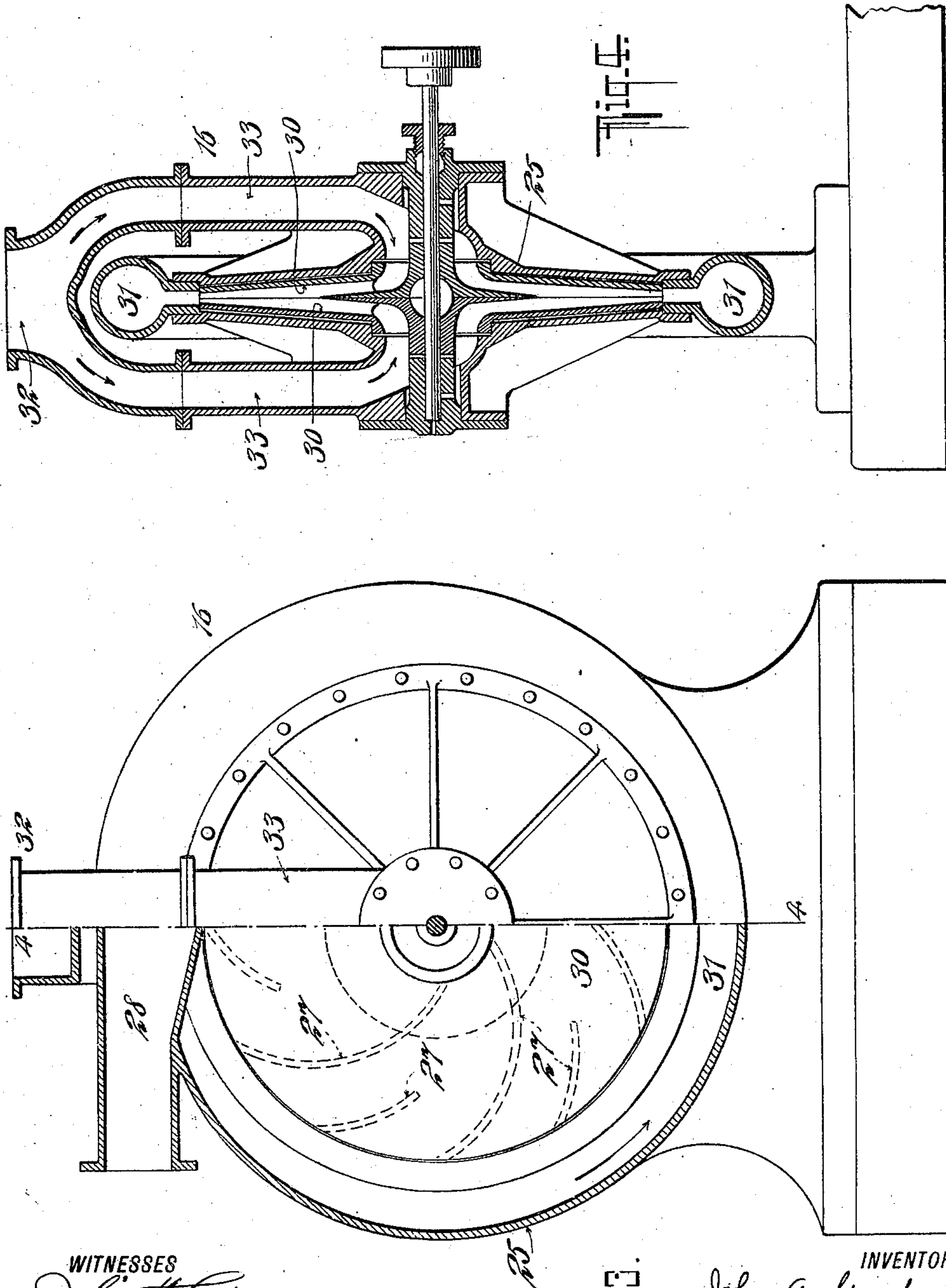
John A. Groshon. INVENTOR
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3 SHEETS—SHEET 3.



WITNESSES
Julius H. [Signature]
Arthur Marion.

INVENTOR
John A. Groshon
BY
Chas. C. Gill
ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN A. GROSHON, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO EMILE J. MÉTÉRIÉ, OF EAST ORANGE, NEW JERSEY.

VACUUM-PAN APPARATUS.

963,759.

Specification of Letters Patent.

Patented July 12, 1910.

Application filed May 14, 1909. Serial No. 495,846.

To all whom it may concern:

Be it known that I, JOHN A. GROSHON, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Vacuum-Pan Apparatus, of which the following is a specification.

The invention relates to improvements in vacuum pan apparatus of the character used for boiling sugar and for other purposes, and it consists in the novel features and relative arrangement and combination of parts hereinafter described, and particularly pointed out in the claims.

The object of this invention is to very greatly increase the effectiveness of vacuum pan apparatus and to simplify and diminish not only the initial cost thereof but also the operating and maintenance expenses of the same.

I present my invention herein as embodied in a "dry-system" vacuum apparatus for use in boiling sugar, and said apparatus comprises a suitably supported and constructed vacuum pan, a condenser connected therewith and through which the vapor from the pan passes, a centrifugal pump at the discharge from the condenser and into which the water, condensation products, escaping vapor and air pass, a pipe or barometrical tube extending from the discharge of said pump to a well into which it discharges and within which its lower end is sealed by being extended below the water level maintained in the well, and a motor for driving said pump whereby the latter is caused to exhaust the vapor from the pan and forcibly discharge the water into said tube, down through which the water will pass and, in my construction and arrangement, draw the air with it.

In accordance with my invention the pump, of whatever make, is located between the condenser and the barometrical tube and thereby very substantial advantages over any other vacuum apparatus known to me are attained.

The invention will be readily understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which:

Figure 1 is a side elevation, partly broken away, of a "dry-system" sugar-boiling vacuum apparatus embodying my invention;

Fig. 2 is a vertical section of the same on the dotted line 2—2 of Fig. 1; Fig. 3 is an enlarged side elevation, with one-half in central vertical section, of a continuously acting rotary pump utilized in the apparatus of Fig. 1; and Fig. 4 is a central vertical transverse section of the same on the line 4—4 of Fig. 3.

In the drawings 10 designates a vacuum pan of customary character, 11 the outlet pipe for vapor therefrom, 12 a chamber interposed in said pipe and containing a baffle plate 13 and provided with a drain 14 to the vacuum pan proper, 15 a condenser on the discharge end of said outlet pipe, 16 a centrifugal pump connected with the discharge from said condenser, 17 the pipe or barometrical tube leading from the discharge of said pump to the well 18 in which its lower end is water-sealed and from which the water flows through an outlet pipe 19, and 20 the motor or engine of any suitable character for driving said pump. I preferably mount the vacuum pan, pump and motor on a platform 21, so that the attendant for the pan may also care for the pump and motor.

The condenser 15 has lower converging sides 22 leading to the pump casing and receives the water injector pipe 23, which extends downwardly through the top of the condenser and has a bell-shaped rim-discharge lower end 24 from which the water is sprayed laterally and downwardly to effectually intercept the vapors on their passage to the pump.

The pump 16 is a continuously rotating pump and may be of any suitable design or make. The pump shown is of commercial character and comprises a stationary casing 25 and an internal rotatory member mounted on a driven shaft and consisting of facing side-disks 30 of concavo-convex outline having between them curved blades 27 adapted on the rotation of said member to throw the water and air out through the space between said disks and into the peripheral portion of the pump casing, whence the water and air pass through the discharge 28 and elbow 29 and enter and descend through the water-sealed leg or barometrical tube or pipe 17.

The outer peripheral portion of the pump casing has a channel 31 of gradually increasing diameter leading to the said discharge 28, as clearly shown in Figs. 3 and 4, and the

inlet to the rotary member of the pump is through the top connection 32 and side conduits 33, which lead downwardly and deliver into the hub of said member. During the rotation of the rotary member the liquid and air are thrown through the space between the outer edges of the side disks of said member and enter the channel 31 and are carried through the same by centrifugal action and forced into and through the discharge 28 leading to the barometrical tube 17. The top connection 32 and side conduits 33 constitute a portion of the pump casing, and this casing, as indicated in Figs. 1 and 2, is directly connected with the discharge from the condenser for the vacuum pan. The barometrical tube 17 is preferably connected with the upper side of the pump casing.

One of the most important features of my invention resides in the placing of the vacuum creating pump between the condenser and the discharge pipe or leg 17, since thereby very substantial benefits are derived which are not attained in any other vacuum pan apparatus known to me.

I preferably locate the pump as close to the condenser as practicable, and among the advantages derived from my arrangement and combination of the pan, pump and pipe 17 it may be mentioned that the pump receives both the water and air and hence not only operates effectively in creating the vacuum but effects a forcible discharge of the water and air into the tube or pipe 17, so that the rapidly descending column of water passing through said tube or pipe may act as a constantly descending piston serving to pull the air with it and aiding materially in the creation of a high vacuum in the pan. Another advantage of my invention is that since the pump is between the condenser and the discharge tube or pipe, the air in the latter is prevented from

backing into the condenser. A further advantage of the invention is that the only resistance on the discharge side of the pump is the difference of vacuum existing between that in the upper end of the discharge water-sealed pipe and that created in the pan. The pump being close to the condenser is capable of exhausting the air to better advantage than if the pump were located the distance from the condenser heretofore usual in this art.

The vacuum pan apparatus of my invention is more effective and less expensive both to construct and erect and operate and maintain than any other vacuum pan apparatus known to me.

What I claim as my invention and desire to secure by Letters Patent, is:

1. A vacuum pan apparatus, comprising a vacuum pan, a condenser connected with the outlet for vapor therefrom, a continuously acting pump connected with said condenser, a discharge pipe connected with said pump and water-sealed at its discharge, and means for driving said pump, said pump being between said condenser and said pipe; substantially as set forth.

2. A vacuum pan apparatus comprising a vacuum pan, a condenser connected with the outlet for vapor therefrom, a rotary pump connected with said condenser, a discharge pipe connected with the upper side of said pump to receive the water and air therefrom and being water sealed at its discharge, and means for driving said pump, said pump being between said condenser and said pipe; substantially as set forth.

Signed at New York city, in the county of New York, and State of New York, this 13th day of May A. D. 1909.

JOHN A. GROSHON.

Witnesses:

ARTHUR MARION,
CHAS. C. GILL.