(No Model.)

E. VIGREUX.

APPARATUS FOR PRODUCING CURRENTS OF PURE OR CARBURETED AIR.

No. 272,002. Patented Feb. 6, 1883.

Fig. 1

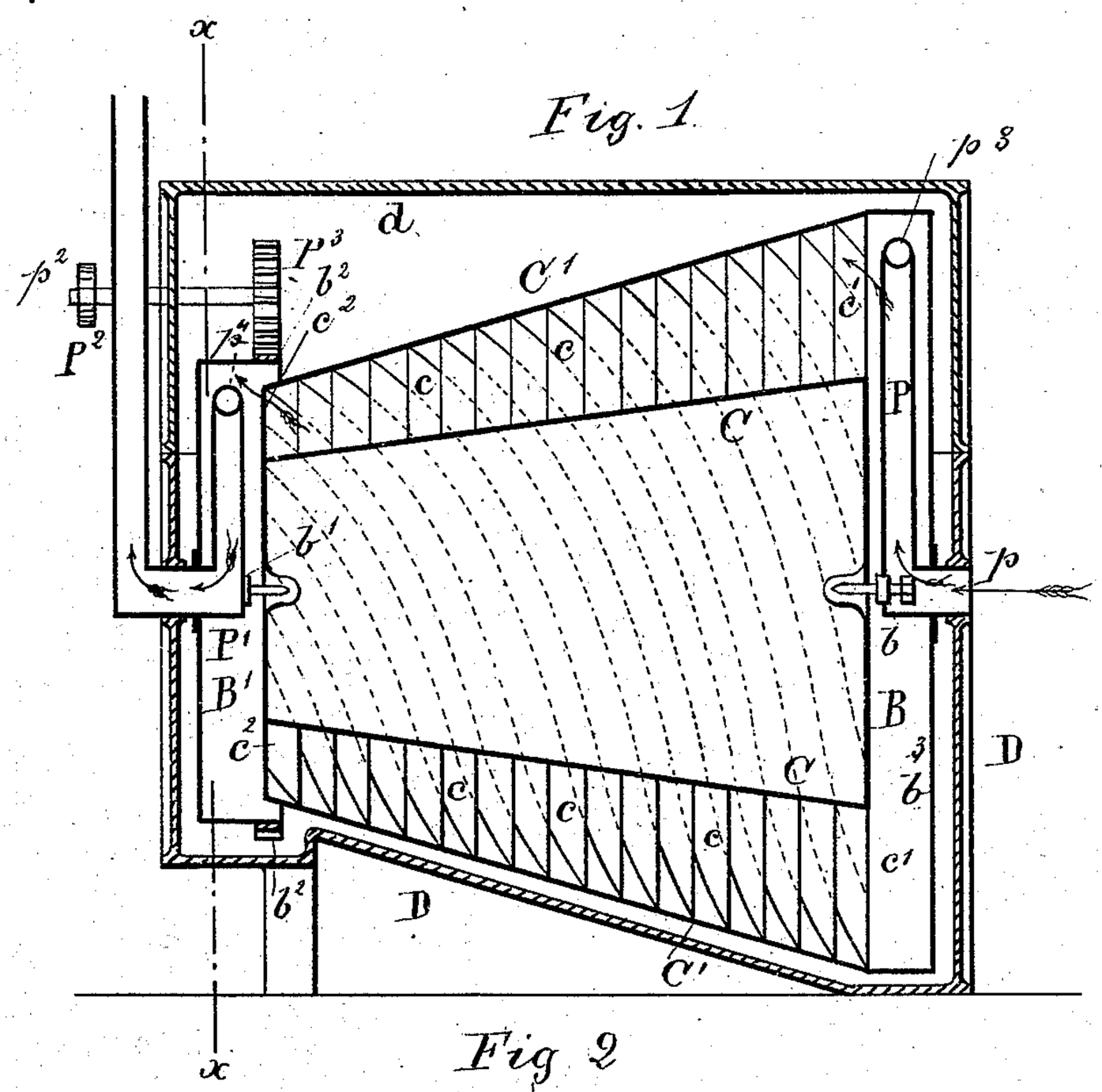
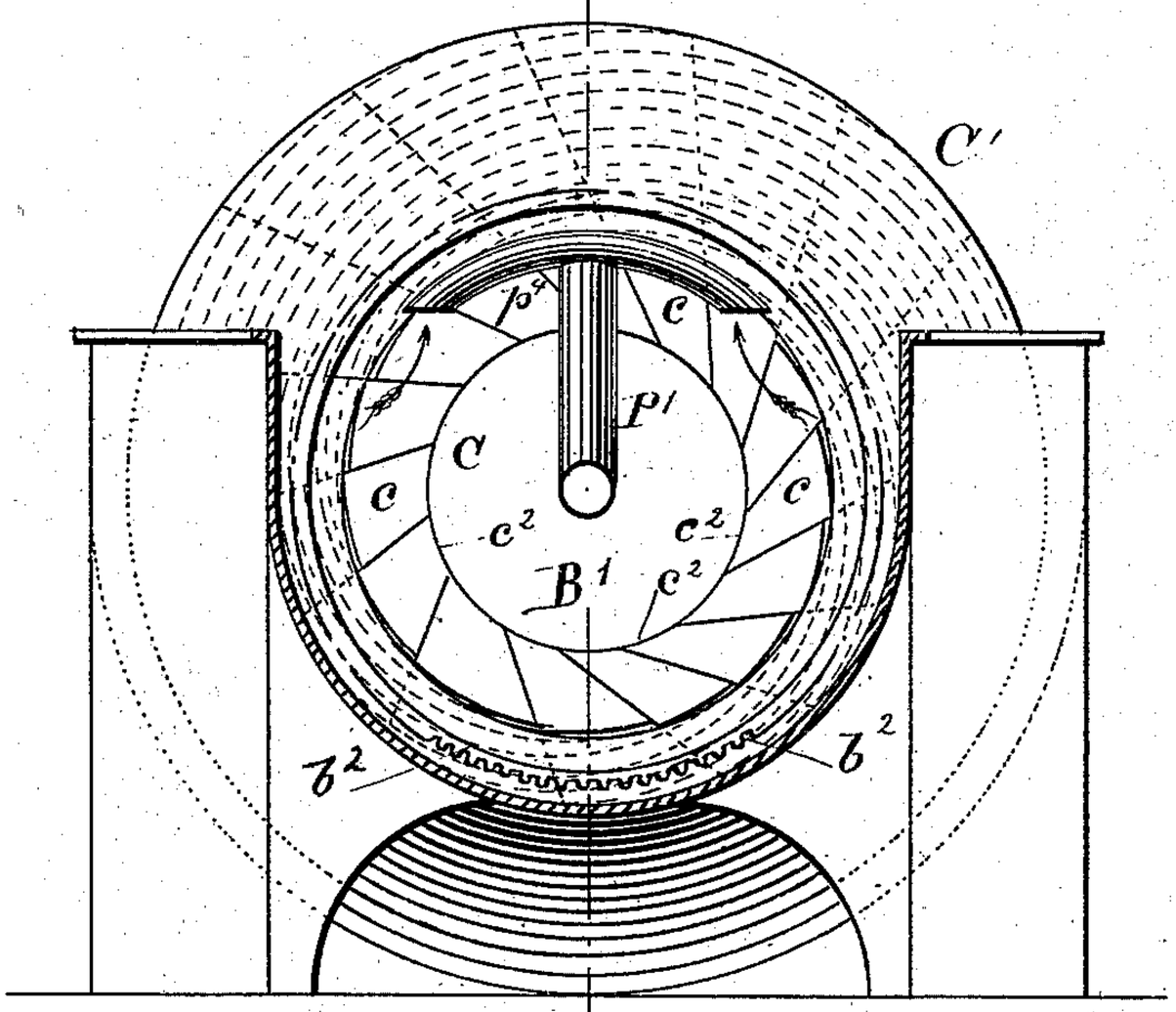


Fig 2



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UNITED STATES PATENT OFFICE.

EMILE VIGREUX, OF BOIS-GUILLAUMÈ, FRANCE.

APPARATUS FOR PRODUCING CURRENTS OF PURE OR CARBURETED AIR.

SPECIFICATION forming part of Letters Patent No. 272,002, dated February 6, 1883.

Application filed July 20, 1882. (No model.) Patented in France March 24, 1882, No. 148,062; in Belgium June 21, 1882, No. 42,237; in Germany June 21, 1882, No. 3,898; in Austria June 21, 1882, No. 20,972; in England June 21, 1882; in Spain June 26, 1882; in Italy July 12, 1882, No. 14,378; in Russia July 12, 1882, and in Sweden July 12, 1882.

To all whom it may concern:

Be it known that I, EMILE VIGREUX, a citizen of France, residing at Bois-Guillaume, in the Republic of France, have invented certain new and useful improvements in apparatus for producing a continuous current of pure or carbureted air, substantially for the transformation of light essences into lighting-gas; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in apparatus for forcing, compressing, and purifying air, and for impregnating or saturating the same with liquids, as hereinafter fully described, and shown in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section, and Fig. 2 a horizontal transverse section on line *x x* of Fig. 1, of an apparatus for forcing and purifying air, and for impregnating or saturating the same with liquids, constructed according to my invention.

C C′ indicate two shells or casings, having the form of a truncated cone, and constructed of any suitable material, such as sheet metal. Between the inner shell, C, and the outer shell, C′, are formed a series of passages, *c*, that wind spirally around the inner cone from its base to its truncated apex. These passages *c*, owing to the conical form of the supporting and inclosing shells C C′, gradually decrease in diameter from their inlet-orifice *c′*, at the said base of the cone, to their outlet-orifice c^2, at the said truncated apex of such cone. At the base of the cone the outer shell, C′, is extended some distance beyond the inner shell, C, thus forming an annular space or chamber, B, within which is located the air-inlet pipe P. At its smaller end said cone is also provided with a like chamber, B′, in which is located the outlet-pipe P′. It will thus be seen that air is admitted to the passages through pipe P, discharging into chamber B, and the purified or saturated or carbureted air is discharged at c^2 into chamber B′, from whence it passes into the discharge-pipe P′. As shown, the cone C C′ is located in a suitable inclosing casing, D, provided with a hinged or removable lid, *d*, the connection of the lid with the casing being made at a point some distance above the center or axis of the cone C C′. The air-inlet pipe P passes through suitably-packed openings in the rear wall, b^3, of the chamber B and the end wall of the casing at *p*, and the air-outlet pipe P′ passes through like openings in the front of chamber B′ and the casing D, where it connects with a delivery-main, P^2. The pipes P P′ are constructed to form bearings *b b′*, respectively, for the trunnions or shaft upon which the cone C C′, with its chambers B B′, is mounted, and in which the said trunnions or shaft and the cone rotate. Motion may be imparted to the cone in any desired manner, either by prolonging the shaft at one end or one of the trunnions, so as to pass through either the inlet or outlet pipes and project beyond the casing D, upon which projecting end a driving-pulley may be mounted, or, as shown in the drawings, by attaching to or forming on the chamber B′ a cogged rim, b^2, to which motion may be imparted from a pinion, P^3, driven from any suitable prime motor—such as steam or other motive power—through the medium of a belt-pulley, p^2; or said cone may be rotated by a worm-gearing or other suitable or preferred means. Each of the pipes P P′ at their upper ends is provided with a branch pipe, p^3 p^4, one of which is shown in full in Fig. 2, said branch pipes having the form of a segment of the circle described by the inner peripheries of the respective chambers within which such pipes are located, and said branch pipes serve as hoods to prevent any liquid dripping from the annular wall of the chambers to enter said pipes.

If the apparatus is to be employed for cooling, purifying, and compressing or forcing air, the inclosing case is filled with cold water to a point on a line with the axis of the cone C C′, or to a point slightly above said axis; and if the apparatus is to be used as a carburetor

the casing is supplied with any one of the hydrocarbons or other volatile oils usually employed for this purpose.

From what has been said it will be readily understood that the cone and its chambers rotate within the casing; that the inlet and outlet pipes are stationary, and that the liquid in the tank has free access to the chambers B B′ and the passages *c*.

The operation of the apparatus is as follows: One-half, or less, of the inlet and outlet orifices c' c^2 of the passages *c* are always above the liquid; but owing to the spiral arrangement of these passages those whose inlet-orifices are above the level of the liquid have their outlet-orifices immersed in and sealed by the liquid, and vice versa. The air coming in at *p* enters chamber B and fills the larger end of those passages that have their inlet-orifices above the level of the liquid. If the cone is now rotated, the passages partially filled with air will be immersed, one after another, at their inlet end, and while their outlet end is yet also immersed. The liquid will rush in, and owing to the greater capacity of that end of the passages *c* a greater volume of liquid than that contained in the discharge end of said passages will first imprison the air and then compress and force it through the liquid at the smaller end before the outlet-orifices of the respective passages have emerged from the liquid. In this manner a constant flow of cool and purified or of carbureted air, as the case may be, is delivered by the apparatus for further use, said air being delivered in a uniform volume and at a uniform pressure to the pipe P′. From the latter pipe it may be conveyed to a receiver, or to a net-work of distributing-pipes, or to a gasometer, according as the apparatus is used for purposes of cooling, purifying, and compressing air, or as a carburetor.

The advantages of the construction of apparatus described may be briefly enumerated as follows:

First. The spiral passages being made to gradually decrease in capacity from the inlet-orifice to the discharge-orifice, the current of the liquid is greatly accelerated and the air compressed and forced through the narrower end of the passages.

Second. The pressure being exerted solely upon the interior walls of the cone, it offers no resistance to the movements of said cone, and no provision need be made against the escape of the purified or carbureted air. Consequently either an open casing or a casing having a movable lid may be employed.

Third. The passages being arranged one by the side of the other, separated by partitions of equal thickness, and said passages being all of a like capacity, the inlet portion thereof in communication with the atmosphere will always take up a uniform volume of air, thereby producing at the discharge end of the apparatus a current of uniform volume and pressure.

Fourth. Owing to the spiral arrangement of the passages *c*, their discharge ends are yet immersed in the liquid when the air is expelled therefrom by said liquid entering their inlet-orifices, thereby forcing the air through the body of such liquid, whereby said air may be thoroughly cooled and is thoroughly purified or carbureted.

Having now described my invention, what I claim is—

1. In an apparatus for cooling, purifying, and compressing air, or for carbureting air, a rotatable truncated cone having a series of spirally-arranged peripheral passages open at both ends, in combination with a tank or inclosing case adapted to contain a liquid, within which said cone is partially immersed, whereby one portion of said passages may be sealed and the other portion placed in communication with the atmosphere, substantially as and for the purposes specified.

2. In an apparatus of the class described, the combination of a rotatable truncated cone having a series of spirally-arranged peripheral passages, and a chamber at each end of said cone, a stationary inlet and a stationary outlet pipe, the former located within the chamber, at the base of the cone, and the latter within the chamber, at the truncated apex of the cone, in combination with a tank or inclosing case adapted to contain a liquid, within which the cone is partially immersed, whereby air fed in at the base of the cone is made to fill a portion of the series of spiral passages, and is compressed within said passages and forced through the liquid by the liquid itself when the cone is rotated, as described.

3. The combination of the cones C C′, having a chamber, B′, formed at one end, provided with a cogged rim, b^2, the induction and eduction pipes P P′, constructed to form bearings in which said cone rotates, an inclosing case or tank, and means, substantially such as described, for rotating the cone within the tank, as and for the purposes set forth.

4. The combination, with the inclosing case or tank D, of the cones C C′, having spirally-arranged passages *c*, the chambers B B′, and the pipes P P′, all arranged and constructed to operate substantially as and for the purposes specified.

In testimony that I claim the foregoing I have hereunto set my hand this 12th day of June, 1882.

EMILE VIGREUX.

Witnesses:
L. D. COURRAINT,
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