(No Model.)

V. POPP.

AUTOMATIC SEPARATOR FOR COMPRESSED AIR SYSTEMS.

No. 446,014. Patented Feb. 10, 1891.

Fig 1

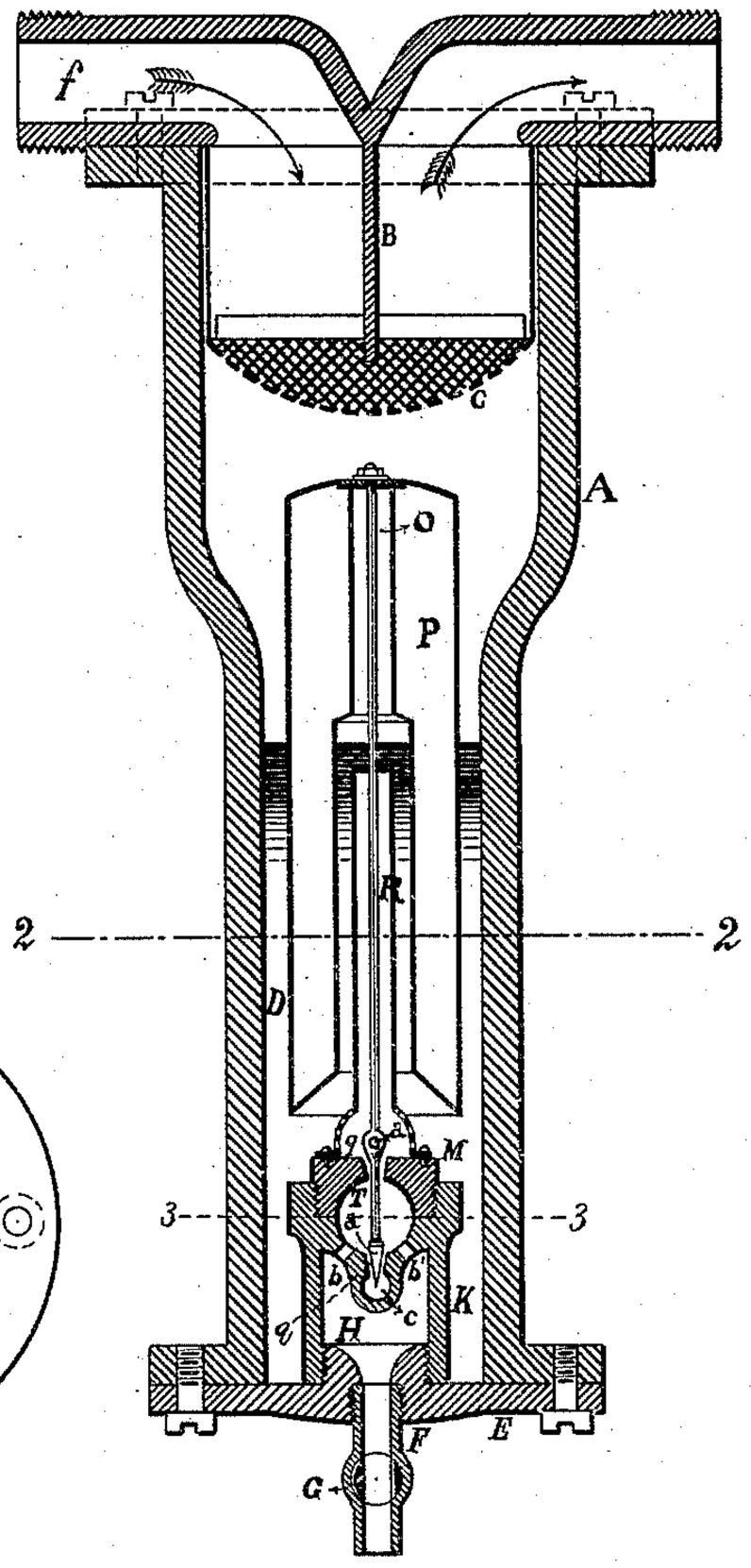


Fig. 3.

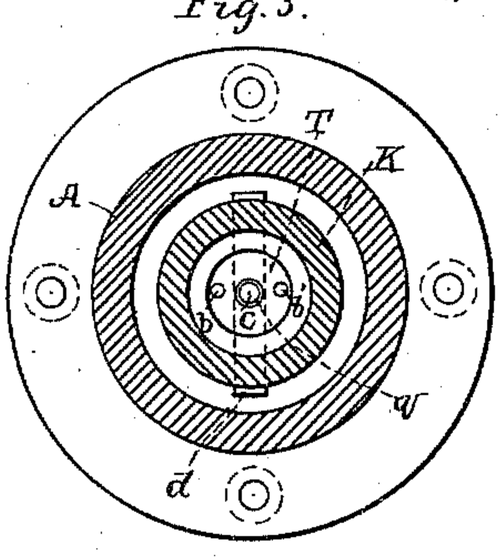
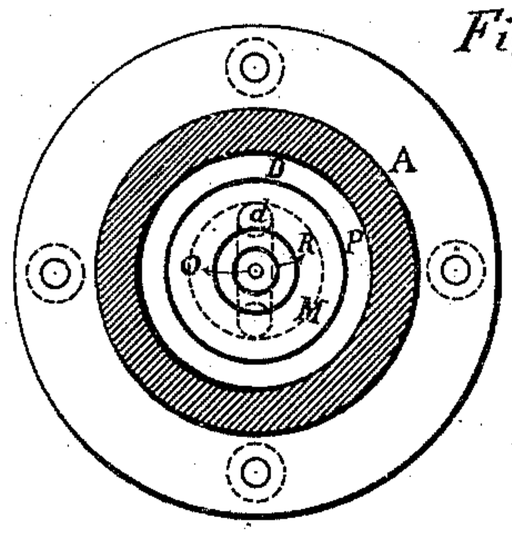


Fig 2



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UNITED STATES PATENT OFFICE.

VICTOR POPP, OF PARIS, FRANCE, ASSIGNOR TO THE POPP COMPRESSED AIR AND ELECTRIC POWER COMPANY, LIMITED.

AUTOMATIC SEPARATOR FOR COMPRESSED-AIR SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 446,014, dated February 10, 1891.

Application filed April 7, 1888. Serial No. 269,984. (No model.) Patented in France November 11, 1887, No. 186,823; in England November 18, 1887, Nos. 15,878, 15,878A, and 15,878B; in Germany December 24, 1887, Nos. 47,546 and 44,745; in Belgium May 7, 1888, No. 81,725, and in Italy June 30, 1888, XLVI, 247.

To all whom it may concern:

Be it known that I, VICTOR POPP, a citizen of the Republic of France, residing at the city of Paris, France, have invented certain new and useful Improvements in Automatic Separators for Compressed-Air Systems, of which the following is a specification.

The said invention has been patented in foreign countries as follows: in France November 11, 1887, No. 186,823; in England November 18, 1887, No. 15,878, No. 15,878A, and No. 15,878B; in Germany December 24, 1887, No. 47,546 and No. 44,745; in Belgium May 7, 1888, No. 81,725, and in Italy June 30, 1888, Vol. 46, No. 247.

My invention pertains to an automatic separator for draining the moisture from compressed air or analogous fluid in a distribution system; and it consists in details which are shown in the accompanying drawings, in which—

Figure 1 is a vertical section; and Fig. 2 is a horizontal section on the line 2 2, Fig. 1. Fig. 3 is a section on line 3 3 of Fig. 1.

In this separator the air enters at *f* in the cast-iron cylinder A and strikes against deflecting-plate B, leaving the water carried by it upon the wire screen C. The water goes through the wire screen, which retains any solid matter which may obstruct the tubes and valves. This water accumulates at the lower part D of the cylinder. The bottom E, which is secured to A, is connected with a pipe F, closed by cock G. Its upper surface is furnished with a circular projection H, on which is screwed a small cylinder K, of which the upper part forms a semi-spherical bowl T, the cover to the bowl being formed by a plug M, screwed into cylinder K. At the top and bottom of the bowl T′ respectively are two circular openings *q*, forming the seat of two conical valves *a*. These two valves are connected by a rod O, which, lengthened above, is fixed to the top of a float P, made of cork or other wood. This valve-rod is guided into the cover of the pipe R, which has at its lower end a perforated bell-shaped enlargement seated on plug M, and from thence extends upward into the central opening of the float P. The water collected at D, being under the pressure of the compressed air, exerts upon the upper part of the valve *a* a pressure tending to keep it closed. The same pressure, but in an opposite direction, is exerted upon the lower valve by the water flowing through an opening *d*, (shown in dotted lines,) which communicates with cavity *c* beneath valve *a*. This connection is more clearly shown in Fig. 3, which is a horizontal diametrical section through bowl T. In this figure *q* is the conical opening forming the seat for lower valve *a*. This opens into the cavity *c* below the bowl, which communicates by transverse tube *d* with the intermediate space between cylinder K and the outside wall of A. The accumulated water in the lower part of A, having the pressure of the air above it, exerts a considerable downward pressure on upper valve *a*, communicating therewith through the perforations in the lower end of tube R. At the same time this water communicates through tube *d* and cavity *c* with lower valve *a* and exerts thereon an upward pressure, counterbalancing its downward pressure on the upper valve. If only the upper valve were employed, it would have above it the internal or compressed air pressure of the pipe system acting through the water, while it would have below it only the external atmospheric pressure of bowl T. The float would in that case have to overcome the pressure of the compressed air before it could lift the valve, which would be quite impracticable. I therefore neutralize this internal pressure by means of the lower valve *a*, which is oppositely exposed to the said internal pressure. *b b*, Figs. 1 and 3, are two holes establishing communication between bowl T and drain-pipe F. When these pressures are balanced, as described, the valves do not move; but when the water has attained a certain level the float P is raised and carries with it the valves *a a*, by means of the rod O, thus opening communication between the water accumulated in the separator and the drain-pipe F through bowl T and passages *b b′*. The water then flows until its level, being lowered,

allows the float to reach its normal position and the valves consequently regain their seats.

A cock G is fixed on the drain-pipe F, which may be opened or closed at will.

I claim—

A separator for a compressed-air system, consisting of a cylinder A, having in its upper part a vertical deflecting-plate and a transverse screen and terminating at its lower end in a receptacle for the moisture provided with an automatic outlet-valve consisting of a float P, and a counterbalanced valve operated by the float and provided with a screen, through which passes the actuating valve-rod, substantially as described.

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