Feb. 20, 1934. J. D. MacLACHLAN 1,948,180

HEAVY FLUID ELIMINATOR

Filed Jan. 4, 1932

Fig. 1.

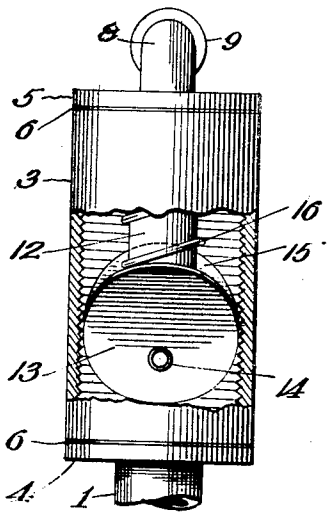


Fig. 2.

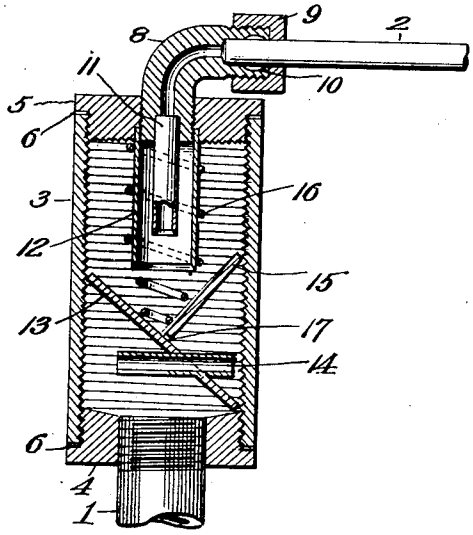


Fig. 3.

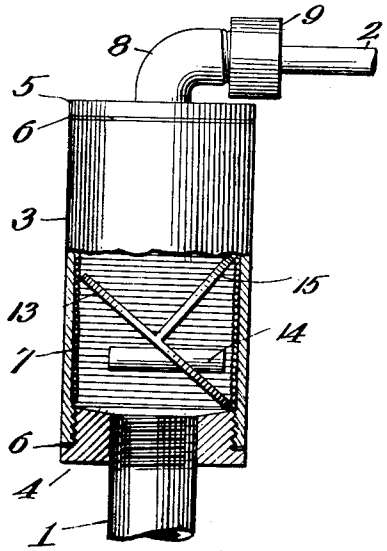
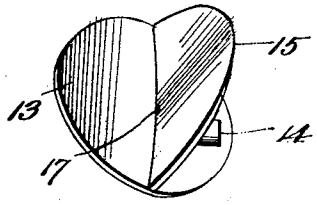


Fig. 4.



Inventor

John D. MacLachlan.

By Thorpe & Thorpe

Attorneys

Patented Feb. 20, 1934 1,948,180

UNITED STATES PATENT OFFICE

1,948,180

HEAVY FLUID ELIMINATOR

John D. MacLachlan, Kansas City, Mo., assignor to Mac Ad Company, Kansas City, Mo., a corporation of Missouri

Application January 4, 1932. Serial No. 584,747

2 Claims. (Cl. 183—99)

This invention relates to heavy fluid eliminators and my object is to produce an efficient device for collecting the moisture in air circulating or flowing under pressure through pipe lines or the like, so that the air delivered shall in cold weather, be dry and hence incapable of freezing and thereby interfering with or impairing the action of movable parts with which the air comes in contact or to which the air indirectly applies moving force.

In damp or wet weather especially, with the temperature at or below the freezing point, air brake systems on street cars and the like, give much trouble due to collection and freezing of moisture in the air lines, and so far as I am informed, there has been no equipment heretofore in such systems or any other system for removing the moisture from the air flowing under pressure, preliminary to the arrival of the air at its point of functional activity.

A further object is to provide a simple, inexpensive and efficient device of the character set forth which withdraws the moisture content of the fluid circulating under pressure and discharges the fluid, in a dry state, and which can be easily and quickly installed at any needed point in a fluid pressure system.

With the objects named in view and others as will hereinafter appear, the invention consists in certain new and useful features of construction and combinations of parts as hereinafter described and claimed; and in order that it may be fully understood, reference is to be had to the accompanying drawing, in which:—

Figure 1 is a broken elevational view of a heavy fluid eliminator embodying the invention.

Figure 2 is a central vertical section of the eliminator.

Figure 3 is a fragmental section of a modified construction.

Figure 4 is a detail perspective view of a baffle plate forming part of the eliminator.

In the said drawing, a pipe line 1—2 is shown as equipped with an eliminator construction as follows: 3 is a shell preferably threaded internally for its full length, and screwed into opposite ends are heads 4 and 5, the heads having fluid-tight connections with the shell through the interposed gaskets 6. The threaded interior wall of the shell between the heads functions to facilitate the removal of moisture from fluid supplied to and carried from the pipe line. It also cooperates with a baffle plate hereinafter described, in the provision of numerous fine passages for dividing the circulating fluid into numerous small jets and thereby insuring direct impingement of all the fluid in finely divided state, upon the walls of such orifices to give most complete opportunity for removal of moisture. The provision of a threaded inner face for the shell between the heads 4 and 5, is desirable chiefly as a measure of economy, as to roughen the surface otherwise would be equally efficacious. Another cheap method of providing the shell with a rough or irregular inner surface is to fit a tightly wound coil spring 7 within the shell, as indicated in the modified construction.

The head 4 has a central threaded opening for engagement by the supply pipe section 1 of the pipe line, and to facilitate drainage of moisture from the shell back into pipe section 1, the opening of head 4 is flared upwardly at its upper end. The head 5 has a central threaded opening in which is secured an elbow 8, and a coupling 9 unites said elbow and the pipe section 2, a packing 10 in the coupling and around the inclosed end of the pipe section guarding against leakage. The elbow has a communicating tube 11 depending into the shell and a guard tube 12 depends from the head around and to a lower point than the tube 11.

Below the tubes 11 and 12 and within the shell, is a baffle plate 13, and said plate is preferably disposed diagonally and is of approximately elliptical contour and of such proportion that it contacts marginally with every convolution of the threaded surface of the shell from the horizontal plane of the head 4 to the horizontal plane of the upper end of the baffle. By this arrangement fluid can pass upwardly beyond the baffle plate, but in passing is divided into a multiplicity of small closely adjacent jets, which contact with the edge of the baffle and the roughened inner surface of the shell. By this frictional impingement or contact of the entire volume of air with the roughened inner surface of the shell, the air is relieved of a large proportion of its moisture, and the latter is free to drain back into the supply pipe. To avoid chance of the baffle being lifted by fluid supplied under heavy pressure, a cross-tube 14 extends through the baffle to permit part of the fluid with its moisture content, to pass to the upper side of the baffle. This tube by directing the fluid against the roughened surface of the shell, effects the removal of part of the small proportion of the moisture, and to increase the volume of moisture withdrawn, the baffle plate has a semi-elliptic arm 15 which pro-

jects divergingly upward relative to the upper part of the baffle plate and, like the latter, marginally contacts with the roughened wall surface of the shell to provide a multiplicity of jet passages through which practically all of the fluid which flows through the cross-tube must pass for moisture removing purposes. The jets of fluid will also impinge on and be further relieved of moisture by the roughened surface of the upper part of the shell and by the roughened lower face of the head 4, and practically all of the fluid relieved of moisture is compelled to reverse its course of travel to gain access to the interior of the guard tube and hence to the tube 11 depending from the elbow. In this reversed or downward travel of the comparatively dry fluid, some moisture may be eliminated by frictional contact with a spring coil 16 fitting around the guard tube and bearing at its opposite ends on head 5 and the baffle plate and arm 15 thereof. The spring not only functions to hold the baffle plate against displacement but also serves to conduct moisture to the baffle plate, the arm 15 being preferably slightly bowed and provided with a small orifice 17 so that all of the moisture collecting on the baffle plate at the junction therewith of said arm 15, shall flow inwardly and escape from the space above the upper part of the baffle plate and its arm, to the space below the latter, and eventually drain back into the pipe section 1, it being noted that the area of the pipe section 1 is many times that of the discharge section 2, to make the travel of fluid as supplied much slower than its travel as discharged, to allow ample time for the heavier constituents to adhere to the multiplicity of collectors formed by the roughened surfaces and the baffle plate, guard tube and spring.

From the above description it will be apparent that while I have described a construction embodying all of the features of advantage set forth as desirable, it is to be understood, that I reserve the right to make all changes within the spirit of the invention and without the ambit of the prior art.

I claim:

1. A heavy fluid eliminator comprising a casing having a bottom intake opening to admit the fluid under pressure and a small outlet passage for discharging the fluid, and a partition disposed within and dividing the casing into two chambers, a cross-tube projecting through said partition, and an arm projecting from the partition above the discharge end of said tube; the said partition and said arm marginally contacting with the inner surface of the casing at points closely spaced apart to provide a large number of fine passages, the points of contact dividing all of the fluid passing through the casing into fine jets between and in contact with the edge of the partition and the wall of the casing and between said wall and the edge of said arm.

2. A baffle partition for heavy fluid eliminators having a body-portion of elliptic contour, and provided at one side with a semi-elliptic arm extending from the front side of the body portion at an angle intersecting the latter, and a tube extending through the body portion to conduct fluid from the rear side thereof to the space between the front side thereof and the rear side of said arm.

JOHN D. MacLACHLAN.