March 26, 1929. A. H. DAVIS, JR 1,706,997

VALVE HEATER

Filed Nov. 10, 1925

Fig. 1.

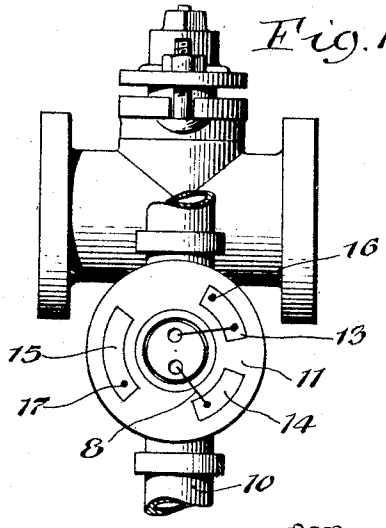


Fig. 2.

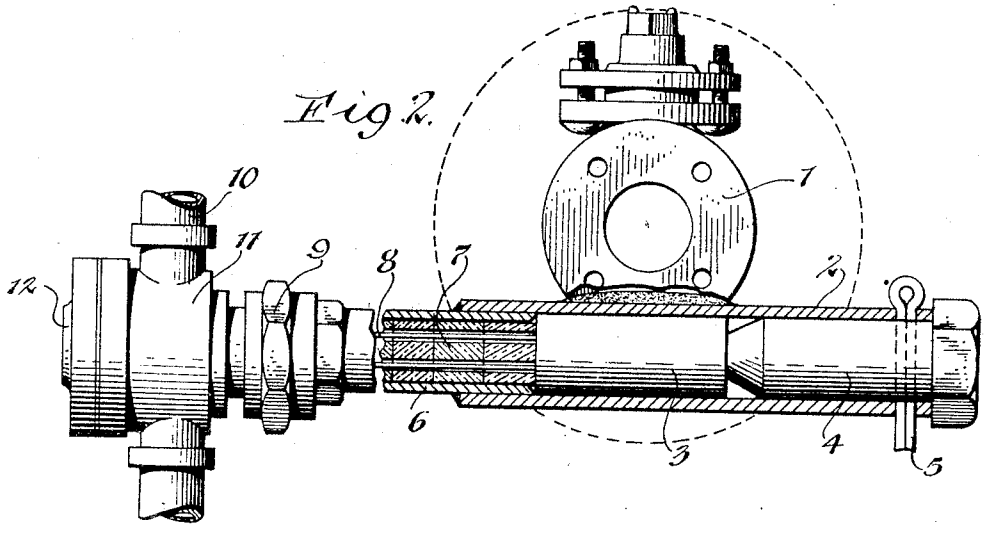


Fig. 3.

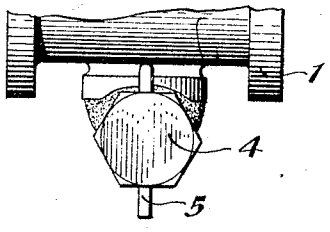
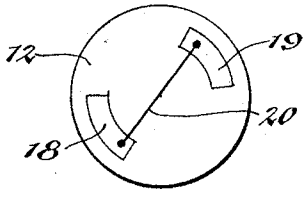


Fig. 4.



Inventor
A. H. DAVIS, JR.
by William J. Warslake
Attorney

Patented Mar. 26, 1929. 1,706,997

UNITED STATES PATENT OFFICE.

ARCHIBALD H. DAVIS, JR., OF BUFFALO, NEW YORK, ASSIGNOR TO NATIONAL ANILINE AND CHEMICAL CO., INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

VALVE HEATER.

Application filed November 10, 1925. Serial No. 68,148.

This invention relates to valve heaters and, in particular, to heaters of the electric type.

In heated pipe lines for materials that freeze at ordinary temperatures, heat needs to be applied as well to the valves controlling the flow of material to keep the material from freezing to the valve elements. However, as such valves are protected with heat insulation, it becomes necessary to apply the heat within the heat insulating jacket.

An object of this invention is a provision of means for heating a valve within the insulating jacket. Another object is such a heating means that may be readily removed and replaced without disturbing the valve or the jacket. These and other objects will appear from the description which follows.

In the drawing

Fig. 1 is an end view of a valve showing the heating means attached thereto;

Fig. 2 is a side view of the valve and the attached heater;

Fig. 3 is a partial view of the other end of the valve; and

Fig. 4 is a detail.

The valve body 1 has integrally united or welded to it, or otherwise secured, a steel tube 2. The tube is of a size to properly accommodate a cartridge type electric heating unit 3, and it is of such a length that it extends beyond the limits of the magnesia or other heat insulation applied to the valve. One end of the tube is closed by a removable plug 4, held in place by a cotter pin 5. To the other end of the tube is secured, as by welding a pipe 6, which forms a continuation of the tube, and in it are assembled a sufficient number of insulating beads 7 to fill its length. Wires 8, passing through perforations in the beads connect with the cartridge 3.

The pipe 6 is connected by a union 9 to a conduit system 10. A condulet 11, in the conduit system and in alignment with the pipe 6, has a removable cover 12. The leads 8 from the cartridge 3 are attached to contact plates 13 and 14 on the condulet body, and contact plates 13 and 15 are in electrical connection with the conduit systems at points 16, 17. On the cover there are two contacts 18 and 19 and a fuse wire 20 connecting them. When the cover is in place, the contacts 19 and 15 form one connected pair, and the contacts 18 and 14 form another connected pair; current then flows from connection 16 to contact 13 through the leads 8 and cartridge 3 to the contact 14, contact 18, fuse wire 20 to contact 19, contact 15 and connection 17.

When it is desired to replace a cartridge, the plug 4 and the cover 12 are removed. The cartridge leads are disconnected and the cartridge can then be withdrawn or pushed out of the tube, as both ends of the tube are accessible.

While the invention primarily contemplates electric heating, it is evident that other heating means may be used. For instance, the cartridge can be a solid having a high specific heat and preheated before insertion in the tube to give off heat to the valve; or it can be a combustible substance generating heat. Where gas or other combustible fluid is available a burner can be arranged in connection with the tube to pass hot gases of combustion through the tube. However, the electric heating unit of the cartridge type is preferred as it requires no attention beyond replacement; and, as it is enclosed by the heat insulation, the heat is conserved for the useful heating of the valve.

By the term "valve" is to be understood any flow controlling body, such as a cock, check valve or the like; and the term is used in this inclusive sense in the claims. Furthermore, by the statement that the tube is welded or otherwise secured to the body, it is intended to include an integrally cast tube as well as a separate tube.

I claim:

1. A valve heater comprising in combination a valve body, a tube in heat conducting relation with the valve body and heating means in heat conducting contact with the inner wall of said tube.

2. A valve heater comprising in combination a valve body, a tube integrally united to the valve body and a heating element in heat conducting contact with the inner wall of said tube.

3. A valve heater comprising in combination a valve body, heat insulating material covering said body, a tube in heat conducting relation with the valve body and extending through and beyond said heat insulating material, and a heating element in heat conducting contact with the inner wall of said tube.

4. A valve heater comprising in combination a valve body, heat insulating material covering said valve body, a tube in heat conducting relation with the valve body, said

tube extending transversely of the valve body and having both of its ends projecting outside of said heat insulating material, and a heating element in heat conducting contact with the inner wall of said tube.

5. A valve heater comprising in combination a valve body, a tube in integral heat conducting relation with the valve body and an electrically heated cartridge in heat conducting contact with the inner wall of said tube.

6. A valve heater comprising in combination a valve body, a tube in heat conducting relation with the valve body, an electrically heated cartridge in heat conducting contact with the inner wall of said tube, an electrical conduit connected with said tube, a condulet in said conduit, and leads from said condulet to said cartridge.

7. A valve heater comprising in combination a valve body, a tube in heat conducting relation with the valve body, an electrically heated cartridge in heat conducting contact with the inner wall of said tube, an electrical conduit associated with one end of said tube, a removable closure connected with the other end of said tube, and leads from said conduit to said cartridge.

8. A valve heater comprising in combination a valve body, a tube in heat conducting relation with the valve body, an electrically heated cartridge in heat conducting contact with the inner wall of said tube, an electrical conduit associated with one end of said tube, a condulet in said conduit, a removable plate on said condulet, and a removable closure connected with the other end of said tube.

9. A valve heater comprising in combination a valve body, heat insulating material covering said body, a tube extending within and through said insulation and juxtaposed in heat conducting contact with the valve body, an electrically heated element in heat conducting contact with the inner wall of said tube and within that portion of the tube surrounded by said insulation, a removable closure in one end of said tube, a pipe securely joined to the other end of said tube and forming a continuation thereof, insulating material in said pipe an electrical conduit connected with said pipe, a condulet in said conduit and in alignment with said pipe, a removable cover on said condulet, contacts on said cover, a fuse connecting said contacts, contacts on said condulet, and leads from said contacts on said condulet to said electrical heating element, said leads passing through and surrounded by said insulating material in said pipe.

10. A valve heater comprising in combination a valve body, a tube in heat conducting relation with the valve body a removable electrically heated cartridge in heating conducting contact with the inner wall of said tube, and a removable closure at each end of said tube.

11. A valve heater comprising in combination a valve body, a tube integrally secured transversely to the valve body, heat insulating material about the valve body and about the tube intermediate the ends of said tube, a removable electrically heated cartridge in heat conducting contact with the inner wall of said tube and positioned in said tube at a point where said tube is surrounded by said insulation, and means whereby said cartridge can be removed from said tube without disturbing said valve body or said heat insulation.

12. A valve heater comprising in combination a valve body, a tube in integral heat relation with the valve body, means for electrically heating said tube, an electrical conduit provided with a condulet and connected to said tube, contacts on said condulet connected to said heating means, a removable cover on said condulet, contacts on said cover, and an electric fuse connecting said contacts on said cover.

13. In an electrically heated valve heater having in combination a conduit and a condulet, a removable cover for said condulet, contacts on said cover, and an electric fuse mounted upon said cover connecting said contacts.

14. A valve heater comprising in combination a valve body, heat insulating material covering said body, a tube in heat conducting relation with the valve body and extending through and beyond said heat insulating material, and a heating element in heat conducting contact with the inner wall of said tube, said heating element being located within that portion of said tube contained within said insulating material.

In testimony whereof I affix my signature.

ARCHIBALD H. DAVIS, JR.