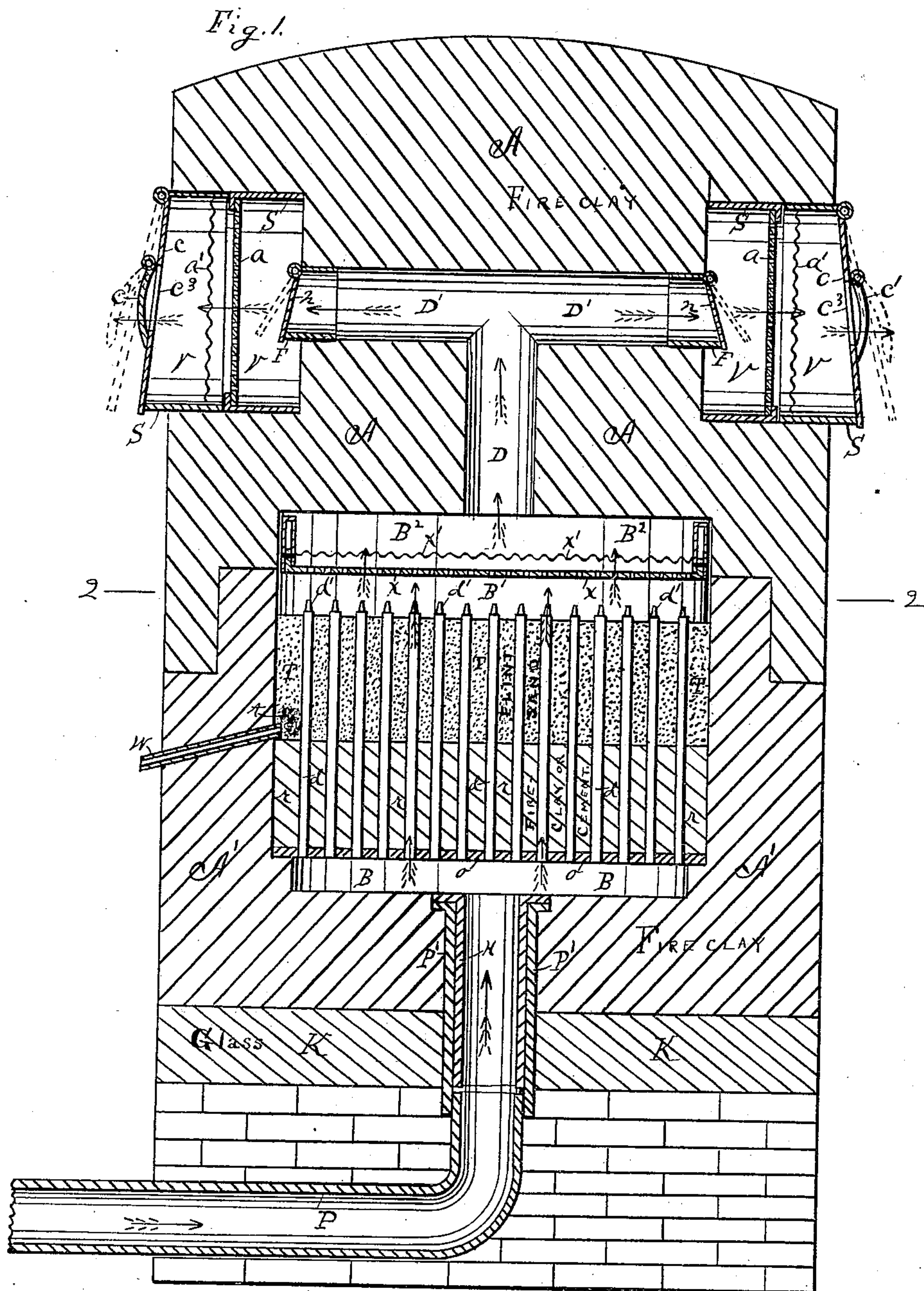


W. J. HALL.

PROTECTOR FOR OIL TANKS.

No. 258,749.

Patented May 30, 1882.



Witnesses

Thos H Hutchins

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Inventor

William J Hall.

(No Model.)

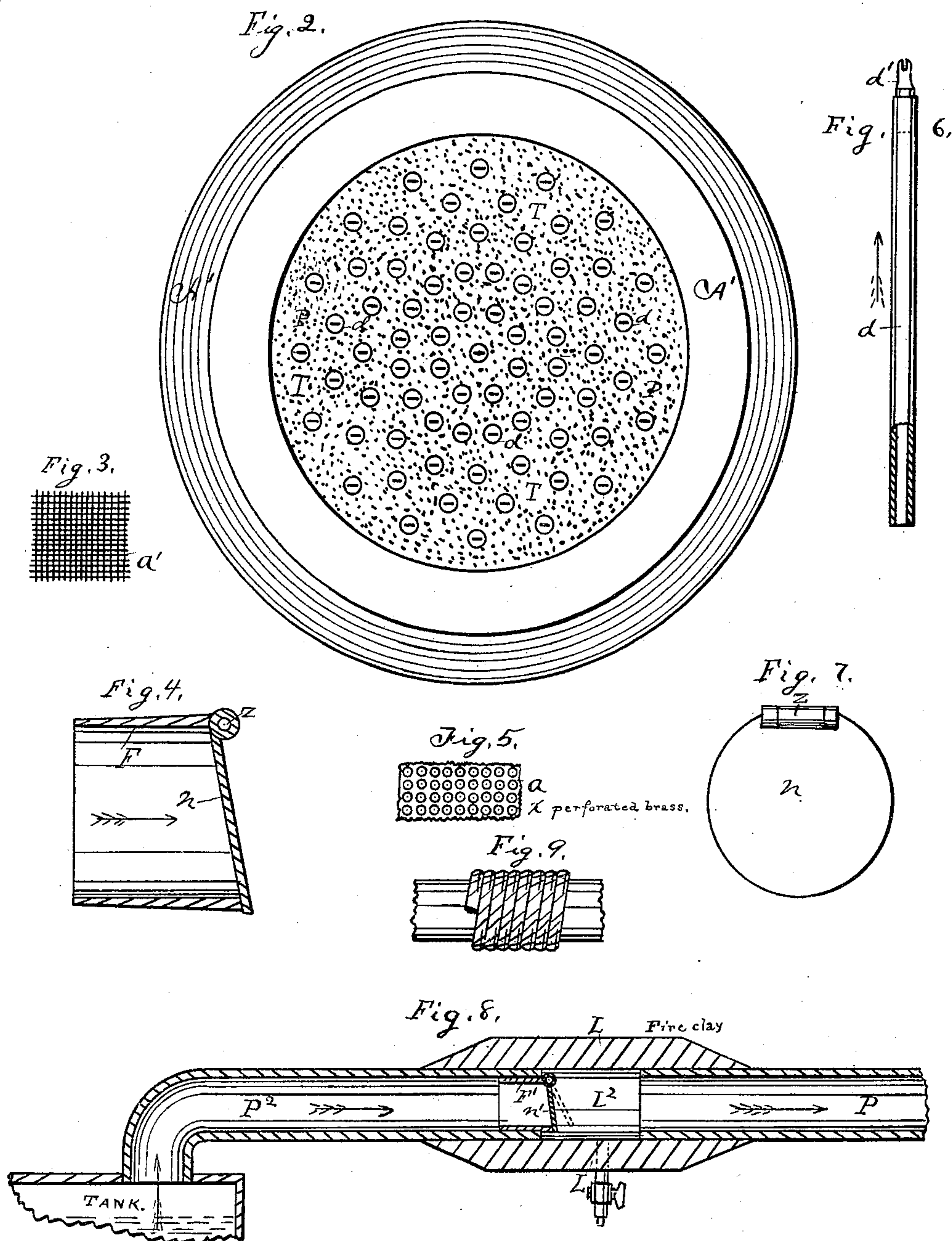
2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

WILLIAM J. HALL, OF SYRACUSE, NEW YORK, ASSIGNOR TO HIMSELF AND  
WILLIAM J. HUTCHINS, OF JOLIET, ILLINOIS.

## PROTECTOR FOR OIL-TANKS.

SPECIFICATION forming part of Letters Patent No. 258,749, dated May 30, 1882.

Application filed November 21, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. HALL, of the city of Syracuse, Onondaga county, State of New York, have invented certain Improve-  
5 ments in Protectors for Oil-Tanks, the construction and operation of which I will proceed to explain, reference being had to the annexed drawings and the letters and figures thereon, making a part of this specification, in  
10 which—

Figure 1 is a central vertical sectional view; Fig. 2, a plan view on the top of the lower section of the protector on the line 2, Fig. 1, where the two parts A and A' join; Fig. 3, a  
15 piece of the wire-gauze; Fig. 4, a vertical sectional view of one of the self-closing back-acting valves; Fig. 5, a piece of perforated brass; Fig. 6, a piece of gas-pipe containing a gas-burner; Fig. 7, a front view of one of the self-  
20 closing back-acting valves; Fig. 8, a vertical sectional view of that portion of the gas-pipe which is broken away from Fig. 1 and connects with the oil-tank, and Fig. 9 a view of covered gas-pipe.

25 The object of my invention consists in the construction of a device to protect and prevent fire or lightning from entering, setting on fire, or exploding oil-tanks or any other tank or place which may require such protection.

30 The protector is designed to stand on the apex of the tank, or it may stand at a distance from the tank. In the drawings it is represented as standing at a distance from the tank, supported by suitable foundations and connected with the tank by the pipes P' P and  
35 P<sup>2</sup> and L, as shown in Figs. 1 and 8. The upper end of the pipe P<sup>2</sup> is provided with a self-closing back-acting valve, *n'*, which opens into the chamber L<sup>2</sup>, which chamber is formed by  
40 the fire-clay pipe L, which connects the pipes P<sup>2</sup> and P, as shown in Fig. 8. The pipe P passes on through the foundation and connects with the pipe P', which passes through the glass insulator K and the bottom of the protector into the chamber B, as shown in Fig. 1.  
45 The pipe P' is furnished with a glass neck or tube, H, on its inner side, which acts as an insulator in connection with the protector A' and glass insulator K. The protector A and  
50 A' is made of fire-clay or its equivalent.

Immediately above the chamber B is a plate, *o*, supplied with a series of small gas-pipes, *d*, fastened into said plate through openings or orifices, leaving the lower ends of the pipes *d* open into the chamber B, as shown in Fig. 1. 55

Immediately above and connecting with the plate or disk *o* is the disk *r*, provided with a suitable number of orifices, formed in concentric circles to correspond with the number of the pipes *d*, and inclosing the pipes *d* to  
60 about one-half their length, as shown in Fig. 1. The disk *r* may be of fire-clay, cement, or any suitable material. The space between the pipes *d* from the disk *r* to about the top of said pipes is filled with fine flint-sand, T, 65  
Fig. 1. The upper ends of the pipes *d* are provided with gas-burners *d'*, which open into the chamber B' above. The chamber B' is separated from the chamber B<sup>2</sup> by one or more partitions of perforated brass, *x*, and wire-gauze, 70  
*x'*, about central.

In about the center of the top of the chamber B<sup>2</sup> is an orifice or opening, D, leading right and left into the orifices or openings D', which are provided with the self-closing back-acting  
75 valves *n*, which open into the chamber V. The chambers V are also partitioned about central with one or more partitions of the perforated brass *a* and wire-gauze *a'*. The large self-closing back-acting valves *c* open out from the  
80 chambers V into the open air, as shown by dotted lines in Fig. 1. The valves *c* are also provided with a smaller valve, *c'*, of the same nature, opening out from the openings *c*<sup>3</sup> in the valves *c* in about their centers. 85

The pipe or tube *w* is placed through the side of the protector, just over the disk *r*, for the purpose of letting out any water or condensed oil that may accumulate in the protector, the pipe *w* being covered on its inner end with a  
90 sponge, *t*, to prevent sand from getting into and filling it.

The self-closing back-acting valves are made, as represented in Figs. 4 and 7, by hinging the valve *n*, at *z*, to a short piece of pipe or tube, 95 tapering a little, so that it may be fitted tight into the orifices, openings, or chambers, as may be required. They may be formed so that the valve *n* will hang inclined or perpendicular.

The protector frame or body is formed in 100



two parts, A and A', and joined together at the line 2, Fig. 1.

Fig. 2 represents the lower portion of the protector, looking down from the line 2, Fig. 1, showing the pipes *d* as arranged in concentric circles, and showing the form of the protector.

Fig. 9 represents the manner in which the conducting-pipes P<sup>2</sup> and P are wound with a suitable cord or twine, which is dipped or saturated with a non-combustible material and painted, making it as nearly as possible a non-conductor of electricity.

The use of the pipes L is to break off the continuous metal conductor which would otherwise exist. The pipe L, being fire-clay, is nearly a perfect non-conductor of electricity.

It will be observed that when any amount of gas may accumulate in the tank it will rise up and pass off through the pipe P<sup>2</sup>, and when a sufficient amount is gathered into said pipe it will press against and open the valve *n'*, letting the said gas pass on into the pipe P, allowing the valve *n'* to close. It then passes on through the pipes P and P' into the chamber B; thence up through the pipes *d* and gas-burners *d'* into the chamber B'; from thence up through partitions of perforated brass *x* and wire-gauze *x'* into the chamber B<sup>2</sup>; thence up through the orifice or opening D into the openings D', pressing against the valves *n*, causing them to open, allowing it to pass out into the chambers V and allowing the valves *n* to close after it. Then the gas passes out through the perforated brass *a* and wire-gauze partitions *a'*, and presses against the valves *c* and *c'*, causing them to open, letting it pass off into the atmosphere. When a very slight pressure of gas comes against the valves *c* and *c'*, the valve *c'*, being smaller, will open, allowing it to pass off through the opening *c*<sup>3</sup> in the large valve *c*, exposing less of the interior of the protector.

When oil tanks or wells are not provided with any means of letting off gas other than allowing it to pass off direct from the tank or well, it is liable to become ignited at any time, either by fire or lightning communicating from

tank to tank, igniting them in turn and causing them to explode or burn; but by means of the protector shown in the drawings it will be seen that when any gas becomes ignited outside of the protector communication will be cut off from the tank and protector by the valves *c* and *c'*, which immediately close after discharge. Should any explosion occur at the time gas is being discharged through the valves *c* and *c'*, the said valves will be immediately closed, extinguishing any flames which may have entered into the chamber V, the valves *n* cutting off communication to the interior.

The cylinder or body of the protector, being made from fire-clay, is a nearly perfect non-conductor of electricity, and by being connected with the glass insulators H and K and covered pipes P and P<sup>2</sup>, saturated with a non-combustible material and painted, the combination is a nearly perfect non-conductor of electricity.

Having thus described my invention, what I claim as novel, and desire to secure by Letters Patent, is as follows, to wit:

1. In a protector for oil-tanks, the cylinder or body A and A', provided with the pipes P and P', chambers B, B', and B<sup>2</sup>, orifices or openings D and D', chambers V, and self-closing valves *n* and *c*, for the use and purposes set forth.

2. In a protector for oil-tanks, the exterior case, constructed in two parts, A and A', and containing the chambers B, B', B<sup>2</sup>, D, D', and V, pipe *w*, perforated clay partition *r*, containing the pipes *d*, provided with gas-burners *d'*, sand filling T, metal disk *o*, valves *n*, *c*, and *c'*, and partitions *a* *a'* and *x* *x'*, all arranged to operate as set forth, and supported on the glass plate K and connected to an oil-tank by means of the pipe P', having the glass lining H, and pipes P, P<sup>2</sup>, and L, in the manner and for the purpose set forth.

WILLIAM J. HALL.

Witnesses:

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T. H. HUTCHINS.