June 28, 1932. T. G. MYERS 1,864,927

STORAGE TANK CONSTRUCTION

Filed Nov. 22, 1929

Fig. 1.

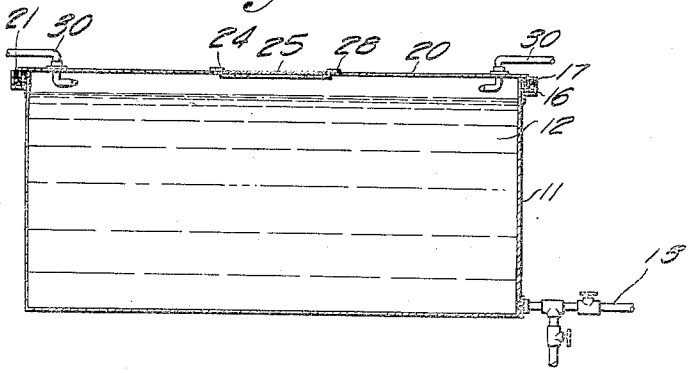
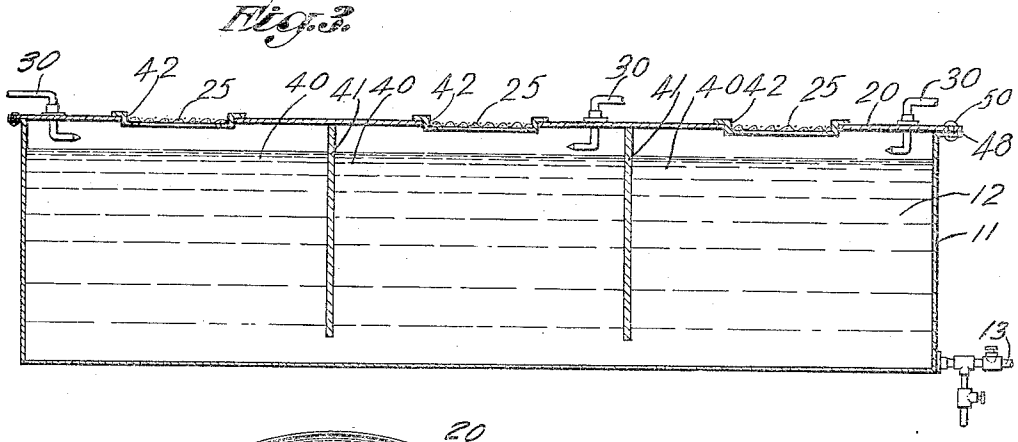


Fig. 2.



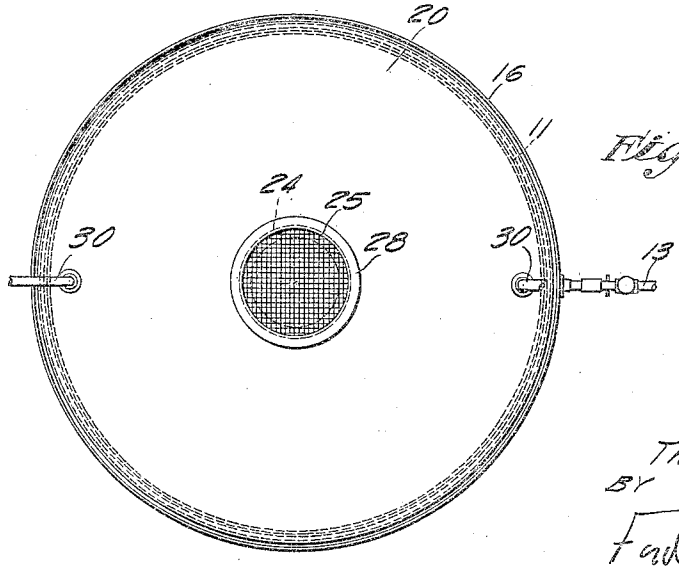


Fig. 2.

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UNITED STATES PATENT OFFICE

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STORAGE TANK CONSTRUCTION

Application filed November 22, 1929. Serial No. 408,984.

My invention relates to a construction for storage-tanks for storing inflammable fluids, and relates particularly to a construction which provides for extinguishing a fire in the tank.

In storage-tanks for inflammable fluids a vent means must be provided for permitting the tanks to "breathe"; that is, for permitting the tanks to take in and exhaust air therefrom in order to compensate for the change in the relative volumes of air and fluid in the tank due to temperature changes and due to an introduction or withdrawal of fluid therefrom. In case an opening is made in the tank to allow for "breathing", there is considerable fire hazard, particularly if the tank contains a highly inflammable fluid, such as naphtha, benzine, gasoline, etc.

It is an object of my invention to provide in a construction for storage-tanks for storing inflammable fluids, a means to permit "breathing" of the tank, and means for quickly extinguishing any fire which might start in the tank.

I have found that fires in tanks containing inflammable fluids are quickly smothered out if the flames can be kept from "rolling" above the surface of the fluid. This "rolling" action is always noticed in open oil fires, and it is by this means that oxygen is carried into contact with the surface of the burning fluid.

It is another object of my invention to provide in a construction for storage-tanks of the above class, a means for eliminating the "rolling" action of a fire in the tank.

I find that the above objects can be accomplished by providing a tank having a tightly fitting top in which a plurality of small closely spaced openings is provided, the combined area of the openings being relatively small with respect to the area of the top.

Another object is to provide in a tank of the above class, a tightly fitting top in which is provided a plurality of small closely spaced holes, the combined area of which is relatively small with respect to the area of the top.

It is also an object to secure a construction of this type by providing a tank having a tightly fitting top in which is a screen covered opening, the area of which is relatively small with respect to the area of the top.

Another object is to provide in a tank of the above class, an auxiliary means for introducing a fire-extinguishing fluid to the interior of the tank to extinguish a fire therein.

Other objects of my invention will be apparent to those skilled in the art from the following description:

In the drawing,—

Fig. 1 is an elevational view, partly in section, of a storage-tank having the construction of my invention.

Fig. 2 is a plan view of the tank shown in Fig. 1.

Fig. 3 is an elevational view, partly in section, of a storage-tank having an alternative form of construction.

Referring to the form of my invention shown in Figs. 1 and 2, I show a cylindrical storage-tank 11 in which is stored an inflammable fluid 12, the fluid being introduced or withdrawn from the tank 11 through a drain pipe 13. Around the top of the tank 11 is a perimetric trough 16 which is welded or otherwise secured to the tank 11 and which contains a sealing fluid, such as water 17. Supported on the top of the tank 11 is a circular top 20 having a perimetric flange 21 which extends downward into the water 17 and forms an air-tight seal around the edges of the top 20.

In the center of the top 20 is a circular "breather" opening 24 which is materially smaller in area than the area of the top 20, but is large enough so that in case a fire occurs in the tank 11 the burned gases may pass therethrough quickly enough to prevent an excessive pressure of explosive violence from building up in the tank. Covering the

opening 24 is a fine-mesh wire screen 25 which is secured to the walls around the opening 24 by a circular attachment ring 28 which may be welded to the top 20 and to which the screen 25 may be welded or otherwise secured. The screen 25 covering the opening 24 may be considered as providing a plurality of closely spaced openings through the top 20.

If a fire should start in the space above the combustible fluid, a rush of gas takes place outward through the opening. This rush of gas is burning when inside the tank but is extinguished upon passing through the interstices formed by the screen 25, and thus cannot endanger surrounding apparatus. Furthermore, this rising stream of gas apparently prevents the further entrance of air which might support combustion and, in any event, prevents the "rolling" action which is inevitably present when the vapors above a combustible fluid are burned. I have found that it is this "rolling" which distributes fresh combustion-supporting air or gas to the surface of the combustible fluid whereby combustion may continue. My invention thus not only prevents any spreading of the flames to adjacent apparatus but almost immediately extinguishes any fire without manual attention.

The screen which I prefer to use has meshes of one-sixteenth or one-eighth of an inch, but screens of other mesh may be used as long as it does not pass a flame and yet allows free communication with the outside air. In certain instances the screen may be completely dispensed with and openings formed in the top 20, these openings being grouped closely together.

As a matter of proportion I have found that good results are obtained in a tank four feet in diameter where the size of the opening 24 is two and one-half feet across, although it should be clear that this ratio may be varied over relatively large limits without destroying the utility of my combination. Furthermore, the shape of the screen and the position of this screen relative to the top 20 may be varied.

In the drawing I have shown diametrically opposite pipes 30 directed into the tank as an added precaution, these pipes supplying a suitable fire-extinguishing fluid. These pipes are, however, not normally in use and are only used in emergencies as, for instance, when the fluid level is very low and when the rush of gas might raise the top 20 to destroy the effectiveness of the combination in extinguishing the fire.

In Fig. 3, I show a construction employed on very large tanks. In this case the tank 11 is divided into a plurality of smaller tanks or storage spaces 40 by the use of baffles 41 which may be secured to the top 20 and which extend downward into the fluid 12. Each of the smaller tanks 40 thus formed is provided with an opening 42 similar in construction to the opening 24.

It will be noted that if the large tank were provided with a single opening in the top, the opening would of necessity be rather large if sufficient venting action to remove danger of explosion were provided. In case this opening is sufficiently large there is a chance that the burned gases might pass out one portion of the opening and fresh air pass into the tank through another portion of the opening, thus supporting combustion in the tank 11 and setting up a rolling action. By dividing the tank 11 into a plurality of smaller tanks 40, I am enabled to use correspondingly smaller openings 42 in the top 12 and thus secure the advantage resulting from the use of a smaller opening.

The form of my invention, shown in Fig. 3, is alternative to the preferred form in that the tank 11 is provided with an annular flange 48 around the upper portion of the walls thereof to which the top 20 is secured by rivets 50, the rivets being riveted sufficiently tight to prevent air leakage into the tank 11 at the joint thus formed. This prevents air from entering the tank except at the opening, and thus has the same effect as the seal formed by the water 17.

I claim as my invention:

1. A construction for a storage-tank for storing inflammable fluids comprising: a storage-tank; a top on said tank; and baffles depending from said top dividing said storage-tank into storage spaces, there being a plurality of groups of small closely spaced openings in said top, each of said groups of openings communicating with a storage space.

2. A construction for a storage-tank for storing inflammable fluids comprising: a storage-tank; a top on said storage-tank; and baffles depending from said top dividing said storage-tank into storage spaces, there being a plurality of groups of small closely spaced openings in said top, each of said groups of openings communicating with a storage space; and fire extinguishing means communicating with each of said storage spaces.

3. A construction for a storage-tank for storing inflammable fluids comprising: a storage-tank; a top connected to said tank in sealed relationship therewith; and baffles depending from said top dividing said storage-tank into storage spaces, there being a plurality of groups of small closely spaced openings in said top, each of said groups of openings communicating with a storage space, the combined area of said groups of openings being substantially less than the area of said top.

4. A construction for a storage-tank for storing inflammable fluids comprising: a

storage-tank; a top connected to said storage-tank in air-tight relationship therewith; and baffles suspended from said top dividing said tank into storage spaces, said top having a plurality of groups of small closely spaced openings formed therein, one each of said group of openings communicating with a respective storage space; and means for introducing a fire extinguishing fluid to said storage spaces.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 18th day of November, 1929.

THOMAS G. MYERS.