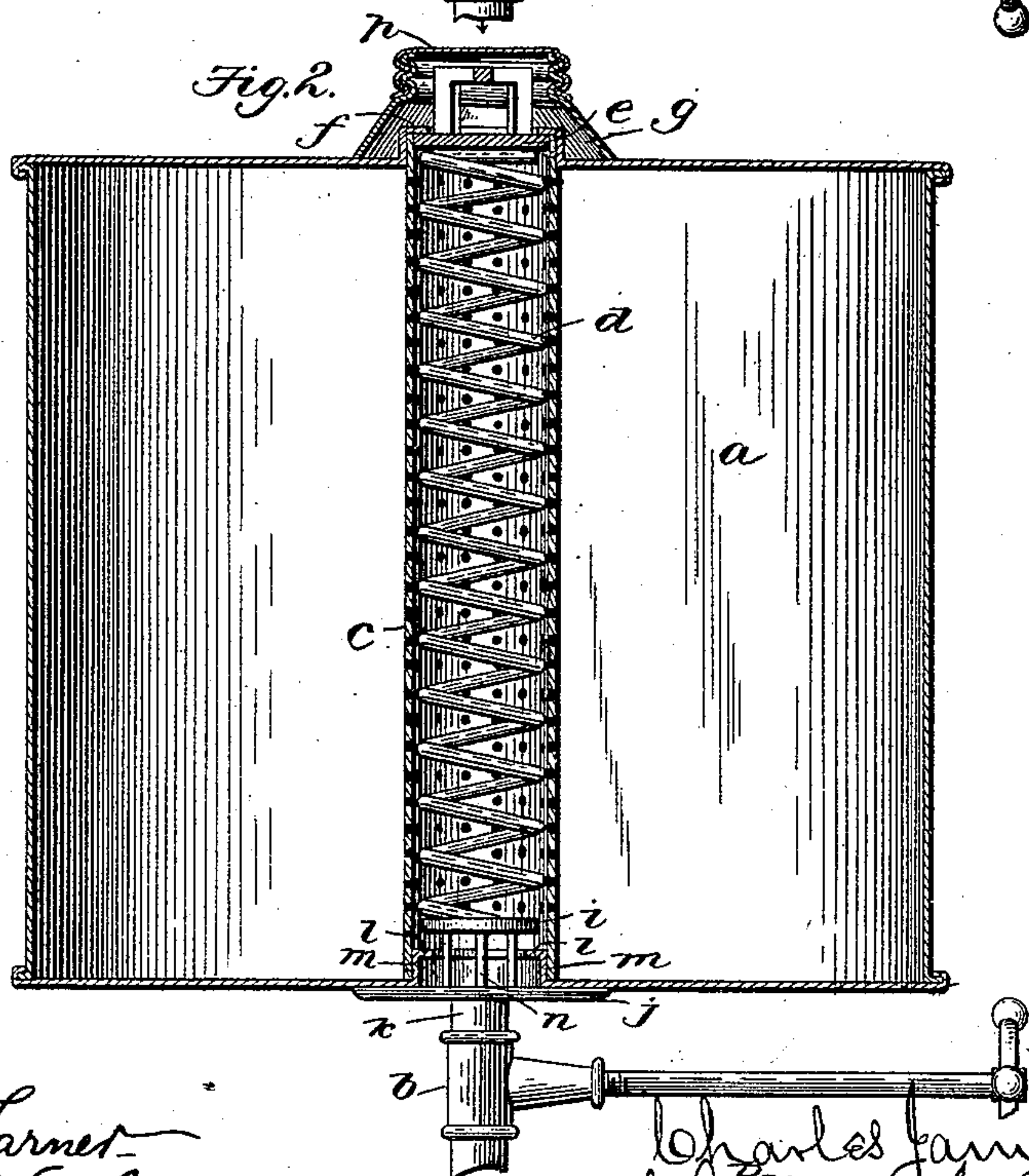
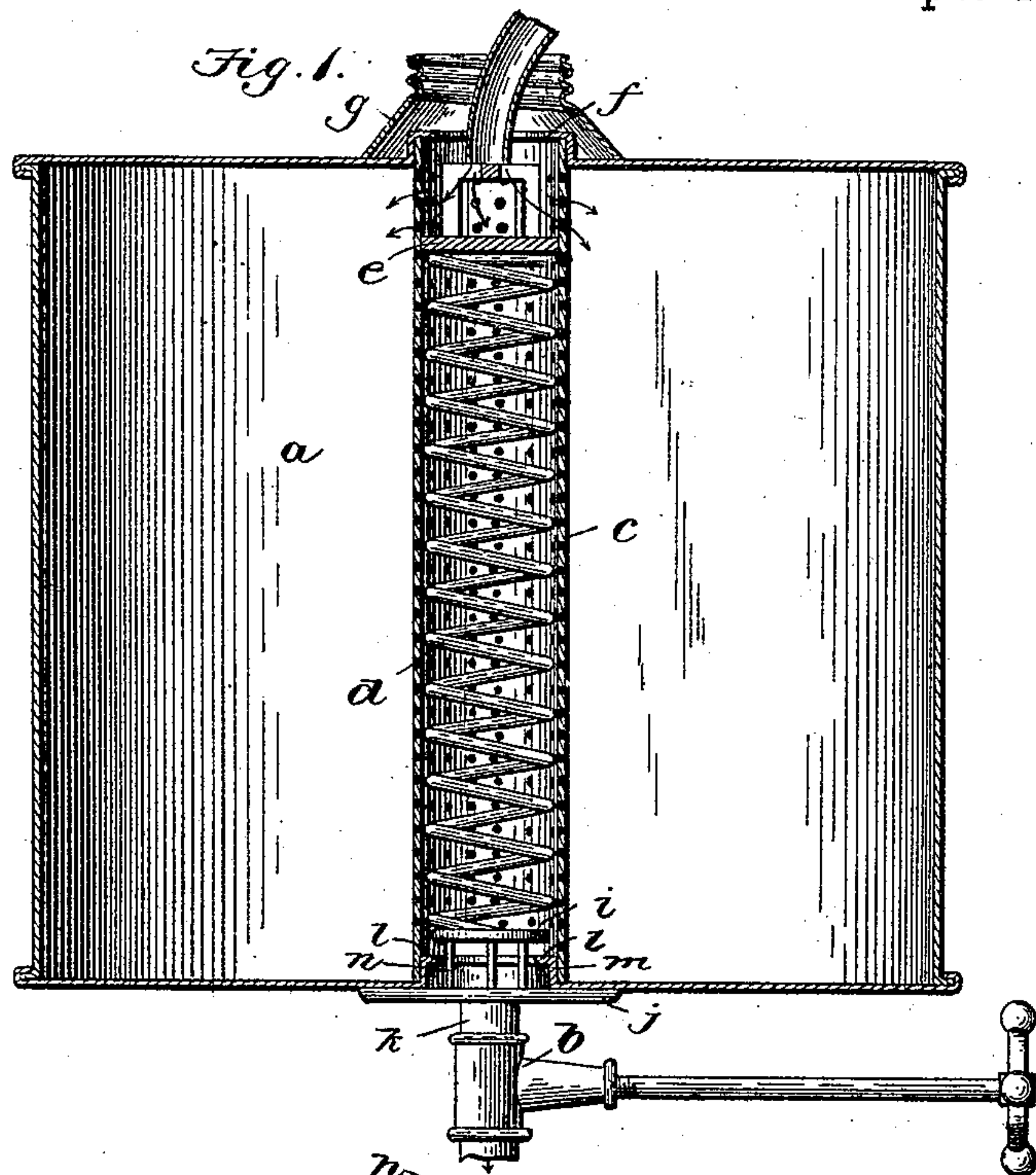


(No Model.)

C. J. RYDER.
SAFETY VESSEL FOR OILS.

No. 472,910.

Patented Apr. 12, 1892.



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UNITED STATES PATENT OFFICE.

CHARLES JAMES RYDER, OF PATCHOGUE, NEW YORK.

SAFETY-VESSEL FOR OILS.

SPECIFICATION forming part of Letters Patent No. 472,910, dated April 12, 1892.

Application filed May 13, 1891. Serial No. 392,605. (No model.)

To all whom it may concern:

Be it known that I, CHARLES JAMES RYDER, a citizen of the United States, residing at Patchogue, in the county of Suffolk and State of New York, have invented certain new and useful Improvements in Safety-Vessels for Oils; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The object of my invention is to secure a vessel containing gasoline or other inflammable liquid against explosion and to automatically extinguish the flame in the event of the ignition of the contents of the vessel while being filled; and my said invention is particularly important in its use with the supply-tanks of gasoline or vapor stoves and with the ordinary supply-cans used to fill such tanks or other vessels.

The accompanying drawings illustrate my invention as applied to the fixed supply-tank of a gasoline-stove, and the particular matters which constitute my invention will be pointed out in the claims concluding this specification.

Referring to the drawings, Figure 1 is a vertical section of a tank or vessel for containing the combustible liquid having my safety device applied thereto and illustrating the operation of filling the vessel. Fig. 2 is a similar view showing my safety device in position to extinguish a flame in the event of ignition.

My invention is designed to render the tank of a gasoline or vapor stove safe against explosion under all conditions of danger from the flame of the stove, and for this purpose my safety device is applicable to both the filling and the outlet openings of the tank; but it will be understood that it may only be applied to the filling-openings.

a is the tank or vessel for containing the liquid, having the usual filling-orifice and outlet-valve *b* as used in vapor-stoves. Coincident with the supply and the outlet openings of the stove-tank I secure a foraminated tube *c* within the vessel, preferably extending from head to head and preferably made with com-

paratively fine mesh or openings. A coil-spring *d* within this tube carries a disk-valve *e* at its upper end adapted to close the supply-orifice at the upper end of the tube. I prefer to use an ordinary disk-valve having an open guide-web standing upward and adapted to close upward within the vessel. The seat *f* for the valve I prefer to make by upsetting the metal around the orifice, so as to form a shouldered rim-seat. This rimmed valve-seat also forms a step or socket to receive and confine the upper end of the foraminated tube and make a close joint at the valve-seat.

The tank may have the usual screw-neck *g* to receive the screw-cap of the filling-orifice; but the normal position of the valve is to close the filling-orifice within the foraminated tube, while to permit the filling of the tank this valve is depressed within the tube, so as to uncover the seat, and the position of the valve when so opened is maintained by pressure thereon applied by the nozzle of a funnel or other means used in such filling.

It is obvious that if in filling the vessel with the valve held opened, as described, the liquid should become ignited at the filling-opening, the flame would be confined within that part of the tube only above the valve, and in such event the withdrawal of the pressure on the valve would permit it to be instantly closed by the spring and put out the flame. It will of course be understood that in this contingency the flame cannot pass through the perforations of the tube into the vessel, and for this reason there can be no explosion either in the tube or in the vessel, for the flame can neither pass the valve or through the walls of the tube, and the vapor which may happen to be in the tube above the valve would be the only fuel for the flame, and this would be absolutely isolated from the body of the liquid and instantly put out by the closing of the valve.

I have described the function of the safety device at the filling-orifice; but I may also apply it for use at the outlet-opening in the bottom of the vessel, and for this purpose I provide for supporting a valve *i* in an open position within the tube to permit the free outflow from the tank by means of the plate *j* of the outflow-pipe *k*, which plate is soldered to the bottom of the tank, so that in the event

of the collection of oil from leakage or other cause at this point and its ignition from any cause the heat might melt the solder, and thus cause the release of the plate *j*, and thereby effect the instant closing of the valve *i* within the lower end of the foraminated tube and put out the flame, which could only enter this tube in such event. For this purpose the spring is provided with a valve at each end, and its force is constantly exerted to close said valves. The seat for the lower valve is formed by a shouldered rim *l*, which stands within the tank and forms a ring-band bearing *m* for the tube to make a close joint and retain the tube in position. In this case the valve is maintained in open position by its guide-web *n*, resting upon the soldered plate *j*, and, like the inlet-valve, is closed by an outward movement under the pressure of the spring, but only in the event of the melting of *j* from the vessel, so that, except in such contingency, this valve is always open within the tube to permit the outflow of the liquid.

In the provision of the tube it is important that it should be formed with fine mesh or perforations throughout its length to prevent flame entering it at either end by accident from passing into the body of the vessel, since flame will not pass freely through a surface filled with small holes, and will therefore be confined within the tube, and thus prevent explosion of the tank. It is important in such provision that the tube have a fixed joining at each end at the inlet and outlet openings in the vessel to prevent free communication between the interior of the tube and the interior of the tank at these points. It is important that both valves be inclosed within this tube and that they be arranged to close upon their seats by a movement from each other by pressure acting in opposite directions upon said valves within said tube. It is important that the outlet-valve be allowed to close the outlet-opening only by the action and effect of heat external to the tank and that such valve be maintained in its normal open position by a fixed part connected with the tank-head by means fusible under heat to destroy such connection and release such valve-support to allow the valve to close the outlet-opening. This provision of a valve released by heat is broadly new in a safety device for a tank containing inflammable oil, so far as I know and can find. In such tanks the outflow supply-pipe has usually been connected to it by solder, the connection of which is liable to be destroyed by external heat caused by the burning of oil from leakage at this point, or by the accidental breaking off and falling of the tank, and in that oil would run out of the tank upon the stove and an explosion of the tank would instantly result. I therefore provide a safety device for this outlet-opening, which consists of a valve supported permanently in open position within the foraminated tube directly upon a plate soldered externally on the tank, so that the

valve will be held open for the flow of the oil from the tank so long as the support of the valve forms a fixed closure therefor from the outside of the tank. This soldered plate serves at the same time as a means of releasing said valve in certain contingencies to allow it freedom to close the opening in the tank to retain the oil and prevent explosion.

I claim as my improvement—

1. In a safety vessel or tank for inflammable liquids, the combination therewith, of a tube formed with fine mesh or perforations throughout its length and having fixed joint connections with the inner walls of said tank around the inlet and outlet openings, a valve within said tube normally closed at its inlet, and a valve within said tube permanently open at the outlet end, a spring pressing upon both valves, and an external support for said outlet-valve secured to the tank by solder to permit the closing of said outlet-valve in the event stated.

2. In a safety vessel or tank for inflammable liquids, the combination, with the said tank having inlet and outlet openings, that for the inlet formed by an outward upset shouldered rim *f*, the opening for the outlet formed by an inward upset shouldered rim *m*, of a tube formed with fine mesh or perforations throughout its length and having fixed seat or joint connection within the shouldered rim at the inlet-opening and over and around the shouldered rim of the outlet-opening, a valve within said tube permanently sustained in open relation to the outlet-opening, a valve within said tube normally sustained in closed relation to the inlet-opening, a spiral spring pressing upon both valves, and an external plate soldered to the said tank for supporting said permanently-open valve, for the purpose stated.

3. In a safety vessel or tank for inflammable liquids, the combination, with said tank having a top inlet and a bottom outlet opening, of a tube having fine perforations and fixed joint connections with both of said openings, a valve for each of said openings arranged within said tube, an expansively-acting spring connecting said valves within said tube, and a plate soldered externally upon the tank for supporting the valve in permanent open relation to the outlet-opening, substantially as described, for the purpose stated.

4. In an oil-tank for gasoline-stoves, a safety device for the outflow-opening of said tank, consisting of a soldered plate for closing said opening, a valve-seat at the inner side of said soldered plate, a valve at the inner side of said seat supported permanently in open position upon said plate, a spring for holding said valve upon said soldered plate, and a tube having fine perforations inclosing said valve and spring, substantially as described.

5. In an oil-tank for gasoline-stoves, the outflow-opening in said tank closed by a plate secured by means which is fusible under heat, a valve within said tank supported perma-

nently in open position upon said plate, a valve-seat between the valve and said plate, a spring for holding said valve upon the plate, and a tube having fine perforations inclosing the spring, the valve, and its seat, for the purpose stated.

6. In a vessel for oils, a safety filling device therefor, consisting of an outwardly-upset rim having a filling-opening, a filling-tube of fine mesh joined to and seated upon the inner wall of said upset rim, extending inward therefrom and inclosing said filling-opening, a valve within said tube seated upon the inner wall of said upset rim, and a spring for closing said valve, whereby in case of ignition the flame will be confined within the said filling-tube and explosion prevented.

7. In a vessel for oils, a safety filling device therefor, consisting of an outwardly-upset rim having a filling-opening formed therein, a filling-tube of fine mesh joined to and seated upon the inner wall of said upset rim, inclosing said filling-opening and extending to and seated upon the inner wall at the outlet-opening and inclosing the latter, a valve within said tube seated upon the inner wall of said outwardly-upset rim, and a spring for closing said valve, for the purpose stated.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES JAMES RYDER.

Witnesses:

A. E. H. JOHNSON,
PHILIP F. LARNER.