

Mar. 3, 1925.

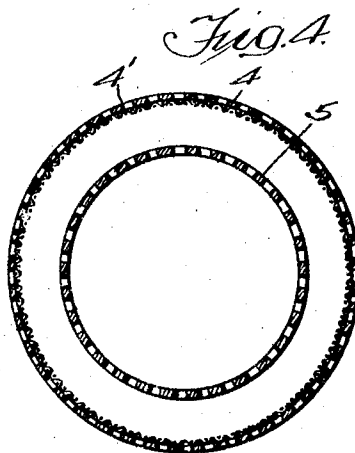
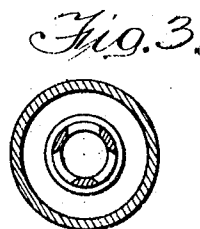
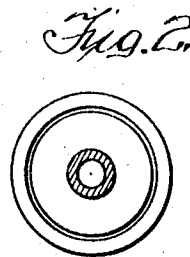
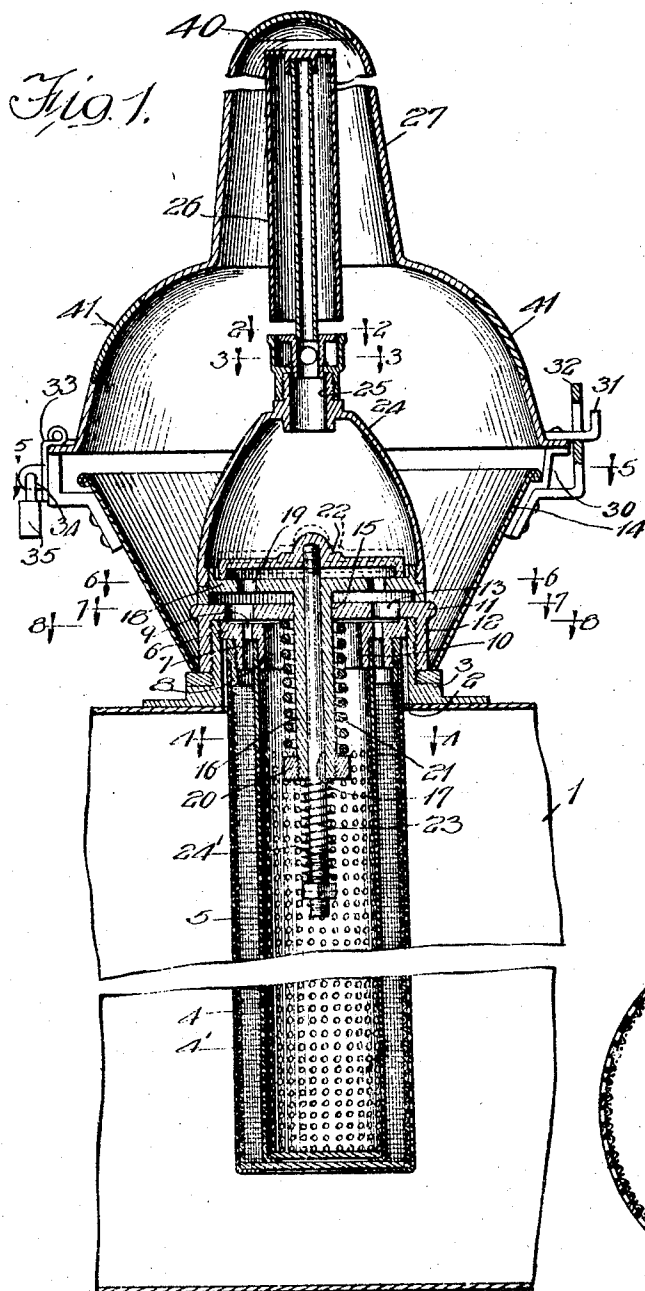
1,528,489

L. KESSLER

SAFETY TUBE

Filed Nov. 12, 1921

2 Sheets-Sheet 1



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Harry R. L. White

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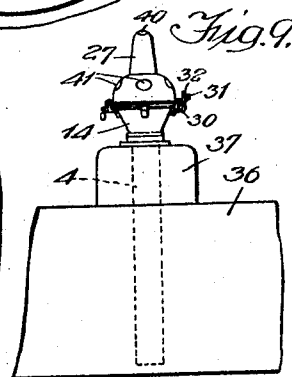
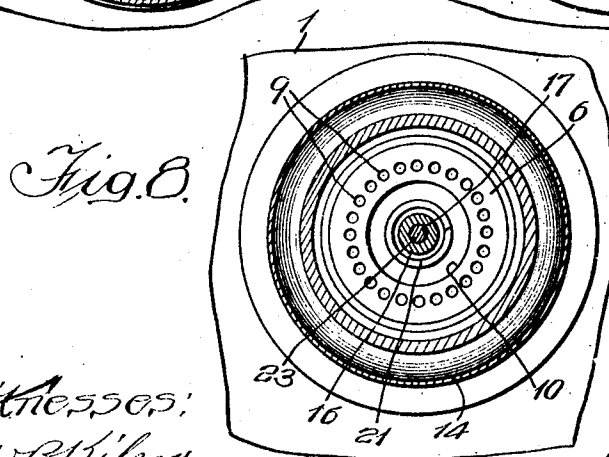
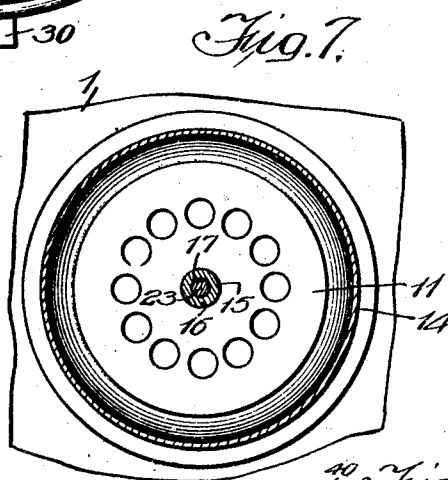
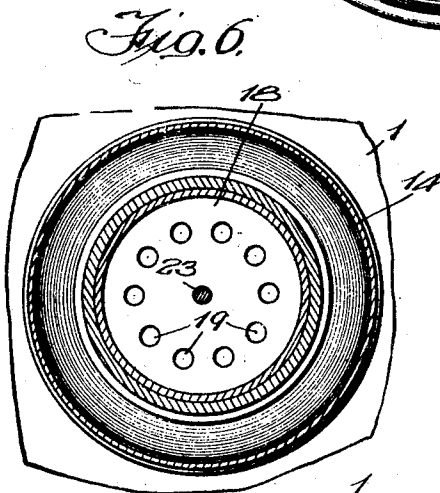
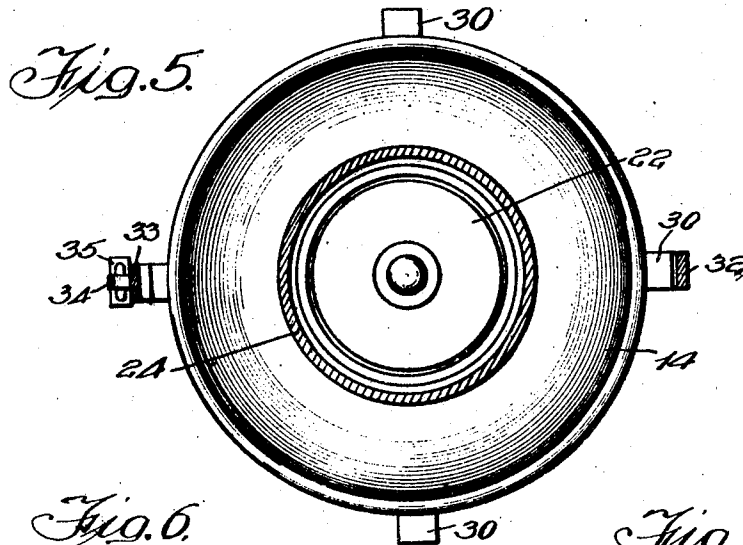
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SAFETY TUBE

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2 Sheets-Sheet 2



Witnesses:
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UNITED STATES PATENT OFFICE.

LOUIS KESSLER, OF CHICAGO, ILLINOIS, ASSIGNOR TO ROY W. HILL, TRUSTEE.

SAFETY TUBE

Application filed November 12, 1921. Serial No. 514,838.

To all whom it may concern:

Be it known that I, LOUIS KESSLER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Safety Tubes, of which the following is a description.

My invention belongs to that general class of devices known as safety tubes, and more particularly to a tube adapted to cooperate with the opening of a receptacle for explosive fluids or the like, said device having means for relieving the pressure of the fluid within the receptacle at a predetermined pressure, and audible signal means for notifying the operator in advance of excessive pressure within the tank. Another object of my invention is to provide a device as above described, especially adapted for use on any receptacle containing an explosive, such as gasoline or the like, to prevent back firing into the tank and to prevent the flames from burning except on the side of the device away from the liquid in the tank so that the explosive fluid within the receptacle will not explode. The invention has among its further objects the production of a device of the kind described which is simple, convenient, compact, durable, reliable, efficient and satisfactory for use wherever found applicable. Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosures herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts,

Fig. 1 is a longitudinal sectional view taken through my device as applied to a tank opening;

Fig. 2 is a sectional view taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken substantially on the line 3—3 of Fig. 1;

Fig. 4 is a sectional view taken substantially on the line 4—4 of Fig. 1;

Fig. 5 is a sectional view taken substantially on the line 5—5 of Fig. 1;

Fig. 6 is a sectional view taken substantially on the line 6—6 of Fig. 1;

Fig. 7 is a sectional view taken substantially on the line 7—7 of Fig. 1;

Fig. 8 is a sectional view taken substantially on the line 8—8 of Fig. 1 and

Fig. 9 is a view in elevation of a portion of a tank car equipped with my device.

In the drawings, wherein I have illustrated the preferred embodiment of my invention, 1 indicates a suitable receptacle for fluids, particularly those of an explosive nature, such as gasoline or the like, and having an opening 2 about which is arranged a flange or collar 3 threaded on its exterior and interior wall surfaces.

Projecting inwardly of the receptacle at the opening 2 are a pair of tubes 4 and 5, said tubes made of wire gauze or the like perforated in their side walls so that fluids may pass therethrough but prevent flame passing therethrough. The tubes are imperforate at their bottoms. The perforations in the inner tube 5 preferably do not extend up as high as the perforations in the outer tube 4. Arranged on the tube, and preferably on the inner wall of the outer tube 4 is arranged a wire gauze 4' of comparatively fine mesh, and it may be mentioned that I prefer a mesh of about 110. A disk 6 is suitably threaded to engage the threads on the inner surface of the collar 3, and has a pair of annular flanges 7 and 8 projecting from one face thereof, the outer flange engaging the upper end of the outer tube 4 so as to maintain it secured thereto, and the inner flange 8 engaging the upper end of the inner tube 5 and holding it spaced radially from the outer tube 4. It will thus be seen that the tubes 4 and 5 and gauze 4' are carried by the flanges 7 and 8. In the member 6, intermediate the flanges 7 and 8, there are formed one or more vents 9 so that the gases or fluids may escape from the interior of the tank through the perforations of the tubes and outwardly through the vents 9. The central portion of the member 6 has an opening 10 therein. A cap 11, preferably in the form of a disk

having an annular flange 12 secured to the exterior threads of the collar 33, is arranged over the member 6 and has one or more vents 13 therethrough communicating with the vents 9 of member 6.

Intermediate the flange of the member 12 and the collar 3 is arranged a trough or funnel-shaped member 14, said member projecting outwardly beyond the cap 11, as shown in Fig. 1. The cap 11 is also axially bored at 15 to slidably receive a hollow stem 16 having a bore 17 through its length. Arranged to seat on the cap 11 is a cap 18 of a diameter to cover the vents 13 and also vented as at 19 for a purpose to be more particularly hereinafter described.

The stem 16 is shown as integral with the cap 18, but it is to be understood that it may be a separate part and secured thereto in any suitable manner. The inner or free end of the hollow stem 16 is arranged with an enlargement or collar 20 thereon, and between the collar 20 and the inner surface of cap 11 there is positioned a coil spring 21 to yieldably resist the lifting movement of the cap 18. An imperforate cap 22 is arranged to seat on the cap 18, covering the vents 19 thereof, so as to control the passage of fluid from the interior of the tank outwardly through said communicating vents 9, 13 and 19. The cap 22 is provided with a rod or bolt 23 extending axially thereof and slidable through the bore 17 of the hollow stem 16, and between the inner or free end of the rod 23 and the free end of the stem 16, there is arranged a coil spring 24' to yieldably resist the lifting of the cap 22.

It will be noted that the spring 24 is lighter than the spring 21 so that when the pressure within the tank reaches a predetermined amount, the escaping gases will pass through the communicating vents 9, 13 and 19, pushing upwardly or outwardly on the imperforate cap 22 and lift it against the tension of the spring 24', so that the gases may escape through said vents. However, as the pressure within the tank further increases and compresses the spring 24', it will act to also compress the spring 21 and lift the intermediate cap 18, so that the escaping gases will not only pass through the vents 19, but outwardly through the space between the caps 11 and 18.

In order to warn the operator or attendant of the excessive pressure within the tank, there is arranged an audible signal means comprising a casing 24 secured to the cap 18 as shown, and having a hollow passage 25 therethrough. A whistle 26 is arranged in communication with the passage 25, so that the gases escaping into the casing 24 will pass outwardly through the passage 25 and operate the whistle 26.

In order to prevent tampering with the

whistle or other parts of the device, and to shield against rain, snow, dirt, or the like, there is provided a guard 27 of a shape to enclose or envelope the parts desired, said guard having any suitable locking means desired cooperable with the member 14 to detachably lock said parts together. The shield 27 is supported on the member 14 by the lugs or brackets 30, or their equivalents for the purpose, so that there is a space between the shield and member 14. As shown, the shield is provided with a part 31 arranged to hook into the member 32, the opposite side of the shield being provided with a hasp 33 arranged to engage with the cooperating eye member 34. The parts may be removably locked together by a small padlock 35, or equivalent means for the purpose. In securing the shield in place, the same is seated over the whistle and parts and moved into engagement with the part 32 and then the hasp turned down and locked. It may be mentioned that the shield is of sufficient height above the whistle to allow the movement of the parts under pressure, so that the device will function satisfactorily. Obviously when the device is in use a predetermined pressure will cause the whistle to be operated, this pressure required depending upon the adjustment of the parts. This causes the warning, and in case proper attention is not immediately given to the tank, any excessive pressure, after reaching a predetermined amount, will be relieved. The guard 14 and shield, in case of ignition of the gas at the tube, will tend to throw the flame outwardly and away from the tank. The shield, as mentioned, not only keeps the rain, dirt and snow away from the device, but also prevents the pilfering of the parts by unauthorized persons. Owing to the gauze 4' in the tubes, it is impossible to explode the tank from flame entering through the tube, and this also prevents water from entering the tank.

In Fig. 9, I have illustrated a tank 36 of a tank car showing a dome 37, at which point the device may be installed. The construction described permits a simplified tank construction to the extent that some of the equipment usually employed on the tank without it may be removed. Generally the tube extends to adjacent the bottom of the tank. If desired the shield 27 may be constructed with one or more parts similar to 40 or 41 separate from the body of the shield, but held in place by soft solder or the like. If the tank becomes ignited at the tube, the heat will cause the solder to melt and release the parts, thereby increasing the size of the spaces for the relief of the pressure and allowing the flames to shoot upward.

Having thus described my invention, it

is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described, or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In a device of the kind described, a safety tube adapted to be arranged at a tank opening and comprising a cap, and cap means movable relative to said first-mentioned cap and operable at predetermined pressures for relieving excess pressure within said tank.

2. In a device of the kind described, a safety tube adapted to be arranged at a tank opening and comprising a relatively stationary cap, and plurality of cap means movable relative to said stationary cap and operable successively at predetermined pressures for relieving excess pressure within said tank.

3. In a device of the kind described and in combination, a safety tube adapted to be arranged at a tank opening and comprising a cap, main and auxiliary vent means operable at predetermined pressures for relieving excess pressure within said tank, and signal means operable by said released fluid.

4. In a device of the kind described and in combination, a safety tube adapted to be arranged at a tank opening and comprising a cap, main and auxiliary vent means operable at predetermined pressures for relieving excess pressure within said tank, signal means operable by said released fluid, and a guard enclosing said signal means.

5. In a device of the kind described, a safety tube adapted to be arranged at a tank opening and comprising a relatively stationary cap having a vent, and a plurality of caps movable successively relative to said stationary cap, and arranged to permit the fluid to escape through said vent when the pressure within said tank reaches a predetermined point.

6. In a device of the kind described and in combination, a safety tube adapted to be arranged at a tank opening and comprising a relatively stationary cap having a vent therethrough, a pair of caps movable relative to said stationary cap to permit fluid to escape through said vent when the pressure within said tank reaches a predetermined amount, one of said movable caps having a vent therein, and springs of different strengths successively controlling said movable caps to yieldably normally maintain said vents in the caps closed.

7. In a device of the kind described, a safety tube adapted to be arranged at a tank opening and comprising a pair of radially spaced perforated tubes, a vented

cap carrying said tubes, a vented cap over said first-mentioned cap and movable relative thereto, a third cap covering the second cap and movable relative to both of said caps and means for yieldably holding both said movable caps in place, whereby they may be lifted in succession to relieve excess pressure within said tank.

8. In a device of the kind described and in combination, a safety tube adapted to be arranged at a tank opening and comprising a pair of radially spaced, perforated tubes, a vented cap carrying said tubes, a vented cap over said first mentioned cap and movable relative thereto, a third cap covering and controlling the vents in said second-mentioned cap and movable relative to both said caps, a heavy spring for yieldably maintaining said first mentioned movable cap in place, to normally close said vents, a lighter spring for yieldably maintaining said second-mentioned movable cap in place, and means whereby said lighter spring will be actuated to permit said second movable cap to lift at a predetermined pressure, and any further increase in pressure will lift both said movable caps.

9. In a device of the kind described, a relatively stationary cap having a vent therein, a second cap movably seated on said cap over said vent and also having a vent spring means yieldably holding said movable cap in position, a stem carried by said last-mentioned cap, a third cap movably seating on said second-mentioned cap and controlling the vent therein and having a rod slidable through said stem, and spring means lighter than said first-mentioned springs means for yieldably maintaining said last-mentioned cap in position.

10. In a device of the kind described and in combination, a relatively stationary cap having a vent communicating with the interior of a tank, a vented cap seated on said first mentioned cap and having a hollow stem projecting therethrough into the tank interior, a spring between said stem and first mentioned cap to yieldably permit relative movement of said caps, a third cap seated on said second-mentioned cap and controlling the vents thereof, and having a rod slidably extending through said hollow stem, a spring lighter than said first-mentioned spring between the free ends of said rod and stem to yieldably permit said last-mentioned cap to lift and uncover said vents when the pressure in the tank reaches a predetermined amount, and whereby any further increase of pressure will cause the second-mentioned cap to lift against the tension of the first-mentioned spring.

11. In a device of the kind described and in combination, a safety tube adapted to be arranged at a tank opening and comprising a stationary vented cap, a plurality of caps

movable relative thereto and controlling said vents means for yieldably resisting the movement of said movable caps, the movable cap secured adjacent said stationary cap also having a vent therein; a whistle carried by said movable caps and operable by the fluid escaping through the vents of the caps when the pressure in the tank reaches a predetermined amount, and guard means enveloping said whistle.

12. In a device of the kind described, a safety tube adapted to be arranged at a tank opening to form a closure therefor and comprising means operable successively at predetermined pressures for relieving excess pressure within said tank.

13. In a device of the kind described and in combination, a safety tube adapted to be arranged at a tank opening and comprising a cap, a pair of spaced tubes carried thereby and having perforations in their side walls, the wall of the outer tube being of wire gauze, main and auxiliary vent means operable at predetermined pressures for relieving excess pressure within said tank and signal means operable by said released fluid.

14. In a device of the kind described and

in combination, a safety tube adapted to be arranged at a tank opening and comprising a cap, a pair of spaced tubes carried thereby and having perforations in their side walls and having imperforate bottoms, the wall of the outer tube being of wire gauze, main and auxiliary vent means operable at predetermined pressures for relieving excess pressure within said tank and signal means operable by said released fluid and guard means detachably enclosing said signal means and cap.

15. The combination with a tank adapted to contain explosive fluid, of vented means operable at a predetermined pressure to relieve excess pressure within said tank, a guard shield for said means having apertures therein to increase the vent space, and fusibly held means for normally closing said apertures.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

LOUIS KESSLER.

Witnesses:

ROY W. HILL,
RUTH M. EPHRAIM.