Dec. 8, 1925. 1,565,036

H. TANK

FIRE EXTINGUISHING GRENADE

Filed May 2, 1921 2 Sheets-Sheet 1

Fig. 1.

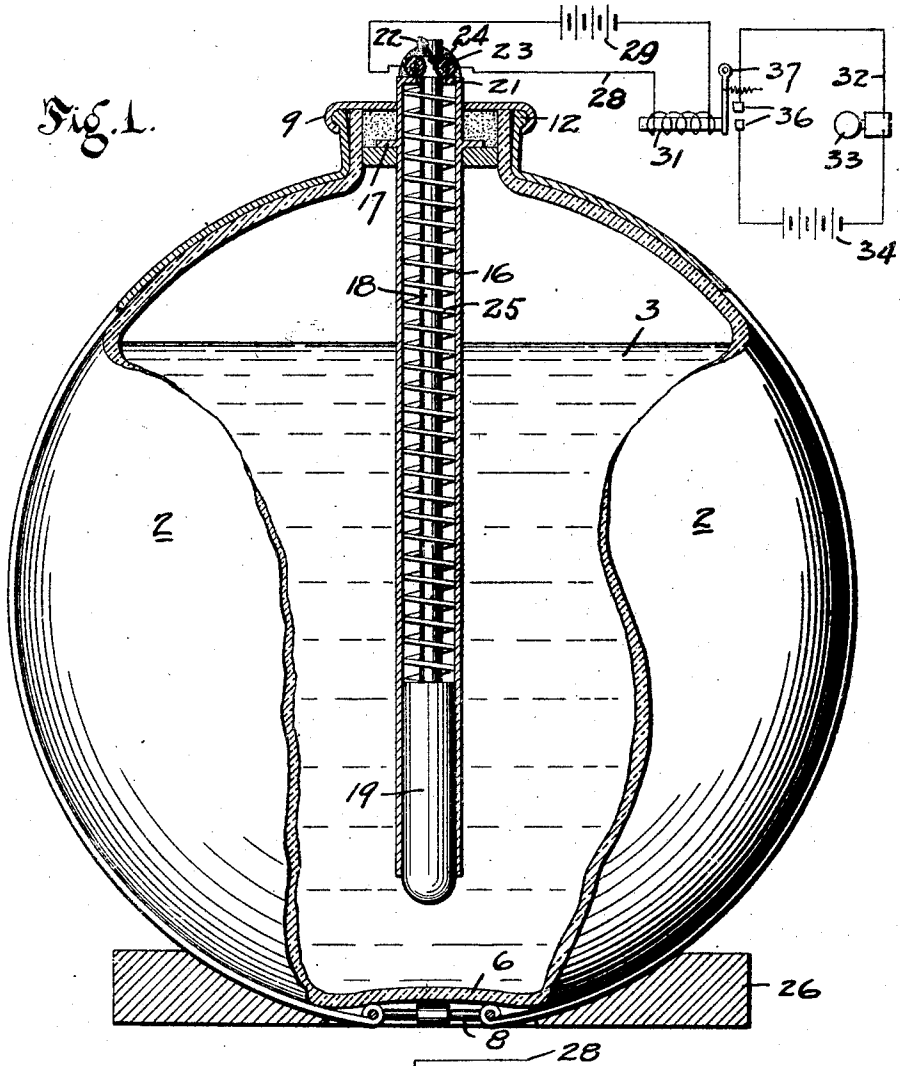
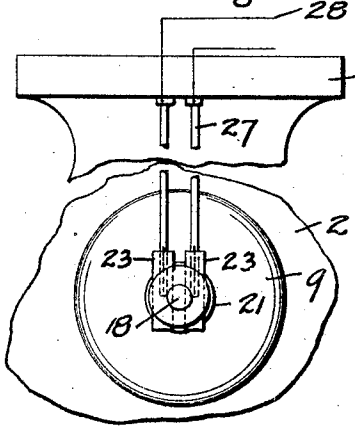


Fig. 2.



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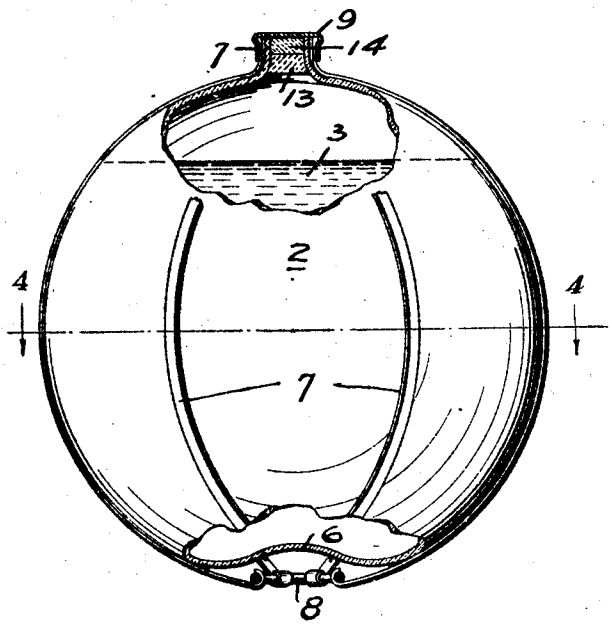


FIG. 3.

FIG. 4.

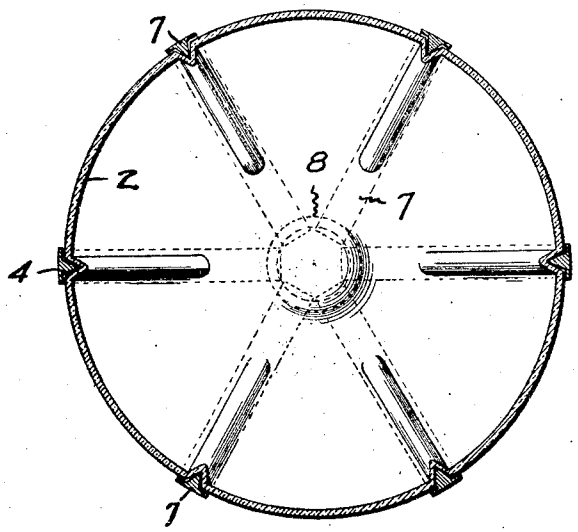
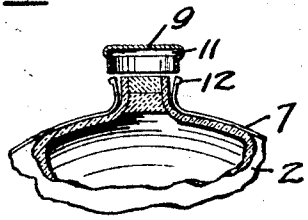


FIG. 5.



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UNITED STATES PATENT OFFICE.

HENRY TANK, OF ALAMEDA, CALIFORNIA.

FIRE-EXTINGUISHING GRENADE.

Application filed March 2, 1921. Serial No. 449,124.

To all whom it may concern:

Be it known that I, HENRY TANK, a citizen of the United States, and a resident of Alameda, county of Alameda, and State of California, have invented a new and useful Fire-Extinguishing Grenade, of which the following is a specification.

My invention relates to fire extinguishing means and especially to grenades for that purpose, and one of the objects of the invention is to provide a grenade which readily breaks when thrown upon the fire, so that its charge of fire extinguishing fluid is released. Another object is the provision of a grenade in which is embodied means for breaking it upon a predetermined rise of temperature. Another object is the provision of an improved fire fighting device of particular usefulness in the holds of ships, or similar places and which combines the advantages to be secured from a hand grenade, which is at the same time a temperature released device embodying signal means for indicating its location.

My invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of my invention. It is to be understood that I do not limit myself to the showing made by the said description, as I may adopt variant forms of my invention within the scope of the claims.

Referring to the drawings, Fig. 1 is an elevation, partly in section of my device. The electrical connections are shown in diagram. Fig. 2 is a plan view of the device. Fig. 3 is an elevation of a modified form of my grenade. Fig. 4 is a horizontal sectional view, the plane of the section being indicated by the line 4—4 of Fig. 3. Fig. 5 is a detail view before the assembly of the cap.

My invention comprises a container 2 of glass or other readily frangible material preferably spherical in shape and adapted to hold a quantity of fire extinguishing fluid 3, such for instance as carbon tetrachloride. The wall of the container is provided with inwardly extending beads forming V-shaped or triangular grooves 4 on the exterior surface thereof, extending from the slightly reentrant bottom 6 of the container to the neck 7. Considered as a sphere, these grooves preferably lie in great circles thru opposite poles. Disposed in the grooves are breaking bands 7 of V-shaped or wedge section as shown in Fig. 4, the sharp edge of the band resting in the bottom of the groove, so that when the grenade is thrown, the impact of collision will drive the band thru the container wall and insure the escape of the extinguishing fluid. The lower ends of the bands are hooked about a ring 8, and the upper ends resiliently held within the cap 9 which is provided with an internal groove 11 into which the bead 12 on the end of the band snaps when the cap is applied.

The extinguishing fluid is sealed in the container by a cork 13 and a superposed sealing compound 14.

The explanation so far applies to both of the structures illustrated in Figs. 1 and 3. The later structure is designed to be placed at strategic points so as to be readily available when needed. It is thrown into the fire and accomplishes its purpose when broken by the impact. The structure illustrated in Figs. 1 and 2 is also capable of the same use, but in addition is provided with means thermally controlled for rupturing or breaking the container in situ, so that it becomes effective upon the rise of temperature to the predetermined critical point. Means are also provided for indicating at a remote point, the operation of the device, so that the location of the bursting container and the fire may be known, and this signal is also operative if the container is removed from its bracket either maliciously or for the purpose of being thrown upon an incipient blaze. The advantage of such a signal is obvious without special discussion.

Referring now particularly to Figs. 1 and 2, I provide a tube 16 which passes thru the center of the cap, cork and sealing compound, and extends a short distance above

the cap on the outside and nearly to the bottom on the inside of the container. A flange 17 resting on the cork and enclosed by the sealing compound fixes the position of the tube. Within the tube, the rod 18 is disposed, terminating at the lower end in the hammer 19 which normally lies a short distance from the bottom of the container. At the upper end, the rod passes loosely thru the end wall 21 of the tube, and is provided with an annular groove 22, in which the cylindrical keys 23, resting on the tube end, are seated. A mass of solder 24 fusible at the desired critical temperature, for instance 185° F., is placed around the end of the rod and the keys to hold the keys in place, thus retaining the rod and hammer in the position shown against the thrust of the spring 25 interposed between the hammer and the end of the tube.

With the melting of the solder at the critical temperature, the downward pressure of the spring throws the keys out laterally and thrusts the hammer sharply against the bottom of the container breaking it and permitting the fluid to escape. So equipped, the container is broken automatically at the predetermined critical temperature. The container is preferably held on a ring bracket 26 and these are fixed at desired points about the premises to be protected. If it is desired that a signal be given when the container breaks or is removed from its bracket, a pair of lightly resilient arms 27, are mounted on and insulated from the bracket. The outer ends of the arms are split to resiliently engage in recesses formed in the keys, and when the receptacle is placed on its bracket, the points of the arms are pulled down a bit and pushed into the keys. The arms are the terminals of the closed circuit 28 which includes a source of electrical energy 29 and the electromagnet 31.

A second circuit 32 including a signal bell 33 and a source of electrical energy 34 is provided with terminals 36. A spring-held switch arm 37 adapted to engage the terminals to close the circuit thru the bell is normally held out of engagement against the core of the magnet 31.

With the melting of the solder 24 and release of the hammer 19, the resilient arms 27 throw the keys upwardly sufficiently to insure the breaking of the circuit 28 and the release of the arm 37 to close the signal circuit 32. If the grenade is removed from its bracket the same result occurs since the circuit 28 is then broken by disengagement of the arms 27 from the keys. In either case the signal is sounded and the location of the trouble indicated.

It is of course understood that with a number of grenades each signal identifies the location of the grenade with which it is associated. Any desired signalling or enunciator system may be used in connection with my grenade, that shown being merely by way of example.

I claim:

1. A fire extinguishing grenade comprising a frangible container having a quantity of fluid therein, breaking bands encircling said container and terminating in resilient ends, and a cap for engaging said ends to hold the bands in place.

2. A fire extinguishing grenade comprising a frangible container having a quantity of fluid therein, breaking bands encircling said container and terminating in resilient outwardly turned ends adapted to lie adjacent the filling neck of the container, and a cap for encircling the filling neck and ends.

3. A fire extinguishing grenade comprising a frangible container having a quantity of fluid therein, and formed with V-shape grooves, and breaking bands arranged in the grooves, said bands having a cross section of sharper V-shape than the grooves.

4. A fire extinguishing grenade comprising a frangible container having a quantity of fluid therein, a tube extending into said container, a hammer arranged in said tube, a spring interposed between said hammer and said tube, cylindrical keys for holding said hammer with said spring under tension, and a fusible solder for retaining said keys in position.

5. A fire extinguishing grenade comprising a frangible container having a quantity of fluid therein, means for breaking said container, temperature controlled means for controlling the release of said breaking means, a circuit closed thru said breaking means and opened by the release thereof, and electrically operated signal means for indicating the location of the container operative by the opening of said circuit.

6. A fire extinguishing grenade comprising a frangible container having a quantity of fluid therein, means for breaking said container, temperature controlled means for controlling the operation of said breaking means, an electric circuit closed thru said temperature controlled means and adapted to be opened when said temperature controlled means permits the operation of said breaking means, and signal means for indicating the location of the container when said circuit is opened.

7. A fire extinguishing grenade comprising a frangible container having a quantity of fluid therein, means for breaking said container temperature controlled means for controlling the operation of said breaking means, means for supporting said container, and electrically operated signal means for

indicating the location of said container and the fact of its breaking or its removal from said supporting means.

8. A fire extinguishing grenade comprising a frangible container having a quantity of fluid therein, a spring-pressed hammer for breaking said container, a pair of keys for holding said hammer with said spring under tension, fusible solder for retaining said keys in position, a bracket for supporting said container, and electric circuit including terminals fixed to said bracket and frictionally engaged with said keys whereby the circuit is completed thru the keys and solder, and signal means for indicating the location of the container when said circuit is opened by fusion of the solder or removal of the grenade from its bracket.

In testimony whereof, I have hereunto set my hand.

HENRY TANK.