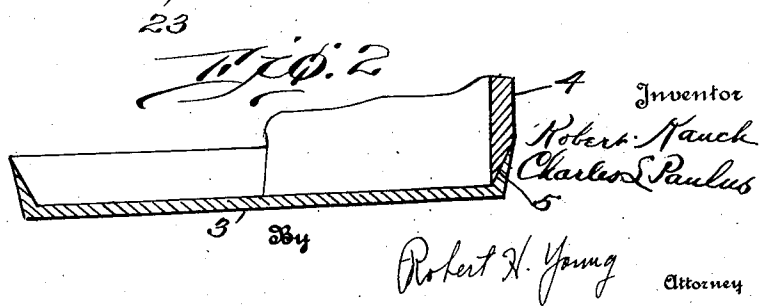
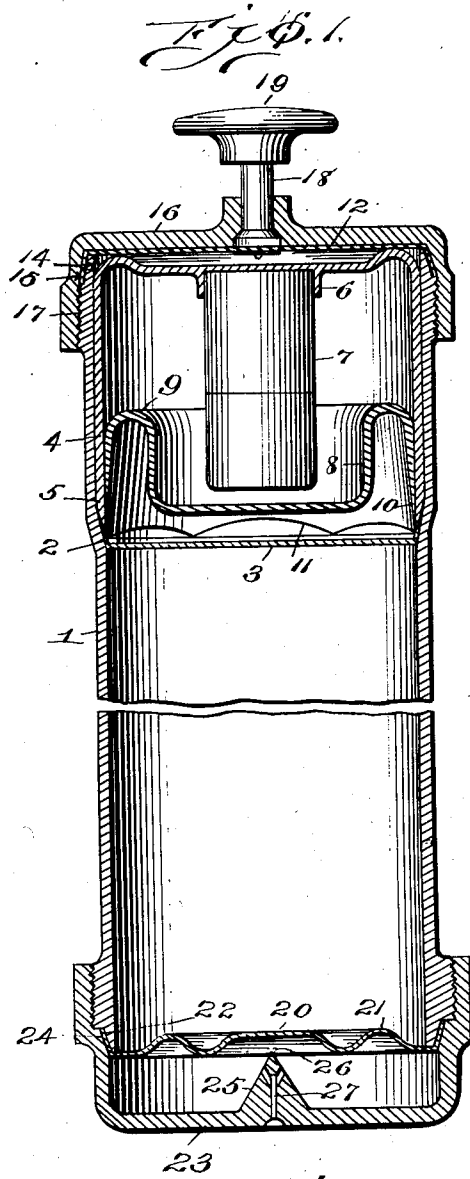


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PYROTECHNIC FIRE EXTINGUISHER

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PYROTECHNIC FIRE EXTINGUISHER.

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This invention relates to a pyrotechnic fire extinguisher.

The object of the present invention is to produce a fire extinguisher embodying in connection with a suitable container, means for closing the end portions of the container when not in use with fluid tight joints, a pyrotechnic means for exerting the necessary pressure in conjunction with a suitable plunger for rupturing the container and sealing means and thereby expressing the fire extinguishing fluid from the container.

Before the pyrotechnic means is put in operation by suitable firing means, the container is absolutely fluid tight so that no part of the fire extinguishing fluid may escape therefrom. When the pyrotechnic means is put in operation, a plunger is actuated lengthwise of the container and by reason of the pressure exerted upon the fire extinguishing fluid, the discharge end closure is ruptured or punctured, thus permitting the outflow of the fire extinguishing fluid.

With the above and other objects in view the invention consists in the novel construction, combination and arrangement herein shown, described and claimed.

Figure 1 is a diametrical longitudinal section through my improved fire extinguisher. Figure 2 is an enlarged detail of the structure of my piston and retaining cup.

The improved fire extinguisher comprises a container 1 for the fire extinguishing fluid, liquid or other agent used. The container 1 may be of any required diameter, length and containing capacity. Preferably the container 1 is of cylindrical form and primarily open at both ends. Adjacent to its rear end, the container 1 is somewhat flared or enlarged and formed with an internal tapering or conical face or seat 2 against which is placed the cupped peripheral portion of diaphragm 3 formed preferably of some light, easily ruptured metal, although other materials may be used in lieu thereof. Within the same end of the container 1 there is inserted a cup shaped holder 4 having an externally beveled end portion 5 which bears tightly against the inner surface of the cupped portion of the diaphragm 3 to hold said diaphragm firmly in place with a fluid tight joint.

The holder 4 is formed with a flanged or reduced opening 6, into and through which

is inserted the pyrotechnic means consisting of a cartridge or shell 7 of easily frangible material such as paper, and containing a charge of powder which upon being ignited will create a gas within the cup 4 for a purpose which will presently appear. Mounted within the cup 4 is a plunger or movable piston 8 which is corrugated as shown at 9 to give the same the necessary strength. The edge portion of the plunger 8 is brought to a knife edge as shown at 10 and such knife edge is preferably scalloped as indicated at 11. When the cartridge 7 is ignited the pressure of the gas generated thereby causes the plunger 8 to move toward the opposite end of the container 1 and the shearing edge of said plunger cuts through the diaphragm 3.

Arranged behind the cup 4 is a sealing diaphragm 12 of any suitable sheet material such as paper or thin sheet metal of a soft nature, the peripheral portion of the sealing diaphragm 12 being cupped and confined against an externally beveled face 14 of the container 1 and a correspondingly beveled face 15 of an end cap 16 having a threaded connection with the adjacent end of the container as shown at 17. The cap 16 which is thus detachable from the container forms a mounting for a centrally arranged firing pin or striker 18, having at its outer end a knob 19 against which the operator strikes his hand in firing the cartridge or shell 7.

The opposite end of the container 1 is closed by a deformable diaphragm 20 formed with annular corrugations 21 as shown, to enable the same to be more readily deformed when pressure thereon is exerted by the fluid in the container 1. The peripheral portion of the diaphragm 20 is cupped as shown and seated against the externally beveled face 22 at the adjacent end of the container 1. The cap 23 is threaded upon the discharge end of the container 1 and formed with an internally beveled seat 24 which bears against the periphery of the diaphragm 20 and confines the same in place with a fluid tight joint. The cap 23 is formed with an inwardly extending nozzle 25, terminating in a puncturing point 26, adapted to puncture a hole in the diaphragm 20 when the latter is pressed against and over the point 26. A bifurcated outlet passage 27 extends through the nozzle 25 and the cap 23 so that when the diaphragm 20

is punctured, the fire extinguishing fluid in the container 1 is discharged through the passage 27.

The operation of the fire extinguisher is as follows:

The operator strikes a blow against the knob 19, causing the firing pin 18 to explode the cartridge 7. The gas formed thereby creates a pressure in the shell 4 behind the plunger 8, driving the plunger forward. This immediately ruptures and displaces the diaphragm 3 which is carried forward by the plunger. The pressure is now transmitted to the fire extinguishing fluid in the container 1 and this brings about the necessary deformation of the diaphragm 20 to cause the same to be punctured by the point 26 of the nozzle 25. Thereupon the passage 27 is uncovered and the contents of the container 1 are discharged by the continued pressure exerted in the rear of and against the plunger 8 by the gas generated by the cartridge 7.

It will be readily understood that new diaphragms 3, 12 and 20 may be substituted when refilling the container 1. This is accomplished by removing the caps 16 and 23 and also the cup shaped holder 4. It is convenient to first replace all of the parts at the rear end of the container, then refill the container through the opposite or discharge end; after which a new diaphragm 20 is inserted in place and the end cap 23 finally screwed into place.

We claim:

1. In a device of the class described, a main casing, a fluid tight diaphragm in said casing, a fluid chamber in said casing, an expressing plunger, said diaphragm normally separating said fluid from said plunger, and means for actuating said plunger to rupture the diaphragm and exert an expelling force on said fluid.

2. In a container of the class described, a fluid tight deformable diaphragm at the discharge end thereof, a second diaphragm in said container, said diaphragms and the walls of the container defining a fluid chamber, an expressing plunger in said container adjacent to said second diaphragm, and means for actuating said plunger to rupture both said diaphragms and exert an expelling force on the fluid.

3. In a fire extinguisher, a casing, a fluid

tight deformable diaphragm at the discharge end of the casing, a second diaphragm in said container, said diaphragms and the casing defining a sealed fire extinguishing fluid chamber, a pointed diaphragm puncturing means having an outlet passage for the discharge of the fluid located near the first named deformable diaphragm and pressure operated means for puncturing the second named diaphragm.

4. In a fire extinguisher, a fire extinguishing fluid container, a fluid tight deformable diaphragm at the discharge end thereof, a second fluid tight diaphragm in the opposite end portion of the container, a plunger arranged behind the second named diaphragm and having means to shear the same, pyrotechnic means for actuating said plunger, and means for puncturing the first named diaphragm, including a removable cap for the discharge end of the container, and a discharge nozzle on said cap having a pointed projection to puncture the first named diaphragm.

5. In a fire extinguisher, a fire extinguishing fluid container, a fluid tight deformable diaphragm at the discharge end thereof, a second fluid tight diaphragm in the opposite end portion of the container, a plunger arranged behind the second named diaphragm and having means to shear the same, pyrotechnic means for actuating said plunger, a cup shaped holder for the pyrotechnic means and means for puncturing the first named diaphragm.

6. In a fire extinguisher, a fire extinguishing fluid container, a fluid tight deformable diaphragm at the discharge end thereof, a second fluid tight diaphragm in the opposite end portion of the container, a plunger arranged behind the second named diaphragm and having means to shear the same, pyrotechnic means for actuating said plunger, a cup shaped holder for the pyrotechnic means, a sealing diaphragm behind said holder, a cap fitted to the adjacent end of the container to hold said sealing diaphragm in place, firing means supported by said cap, and means for puncturing the first named diaphragm.

In testimony whereof we affix our signatures.

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