Sept. 9, 1924. 1,507,745

P. G. MacGREGOR ET AL

FIRE EXTINGUISHING DEVICE

Filed Feb. 17, 1922 2 Sheets-Sheet 1

Fig. 1.

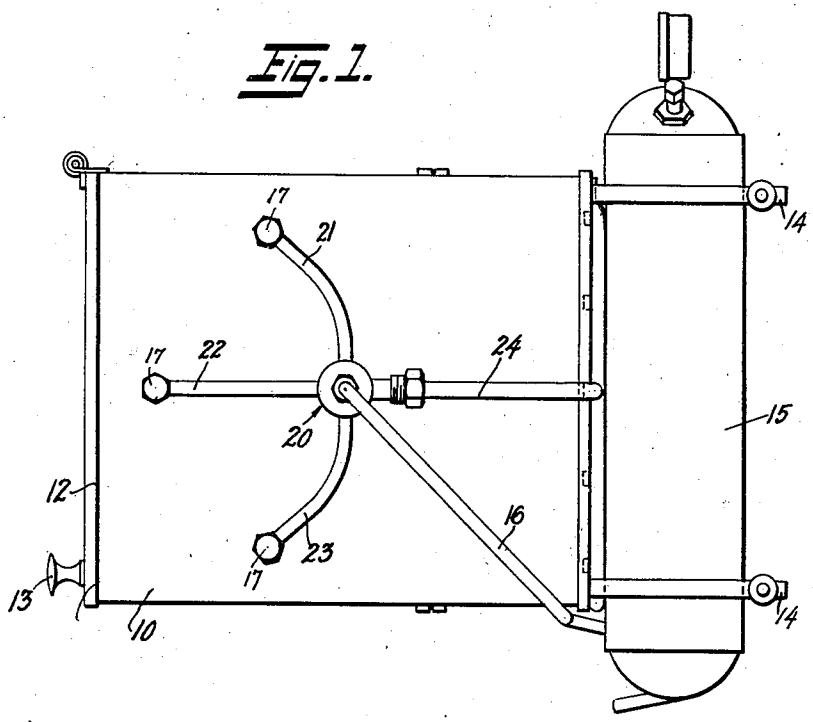
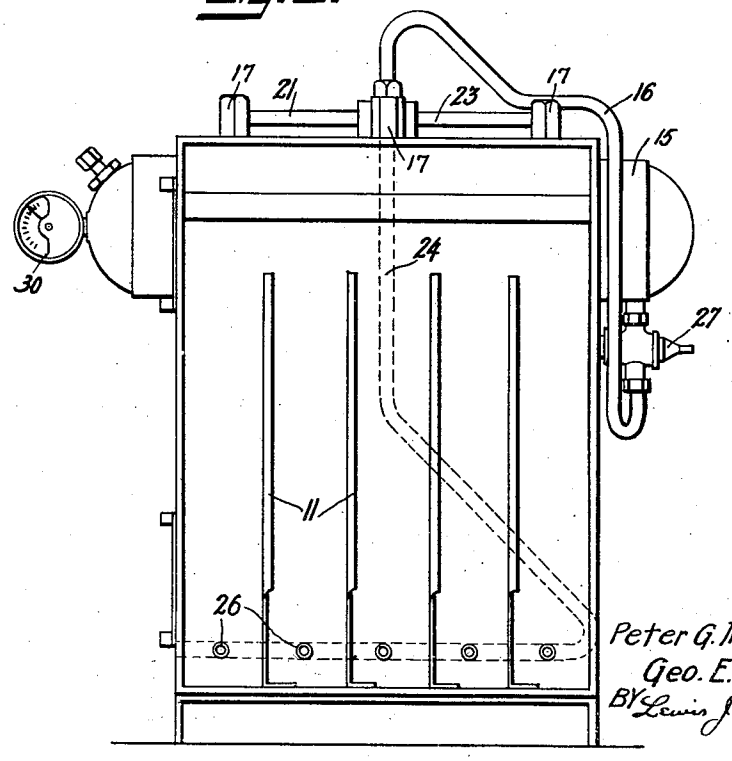


Fig. 2.



INVENTOR
Peter G. MacGregor.
Geo. E. Ferguson
BY Lewis J. Dooliale
ATTORNEY

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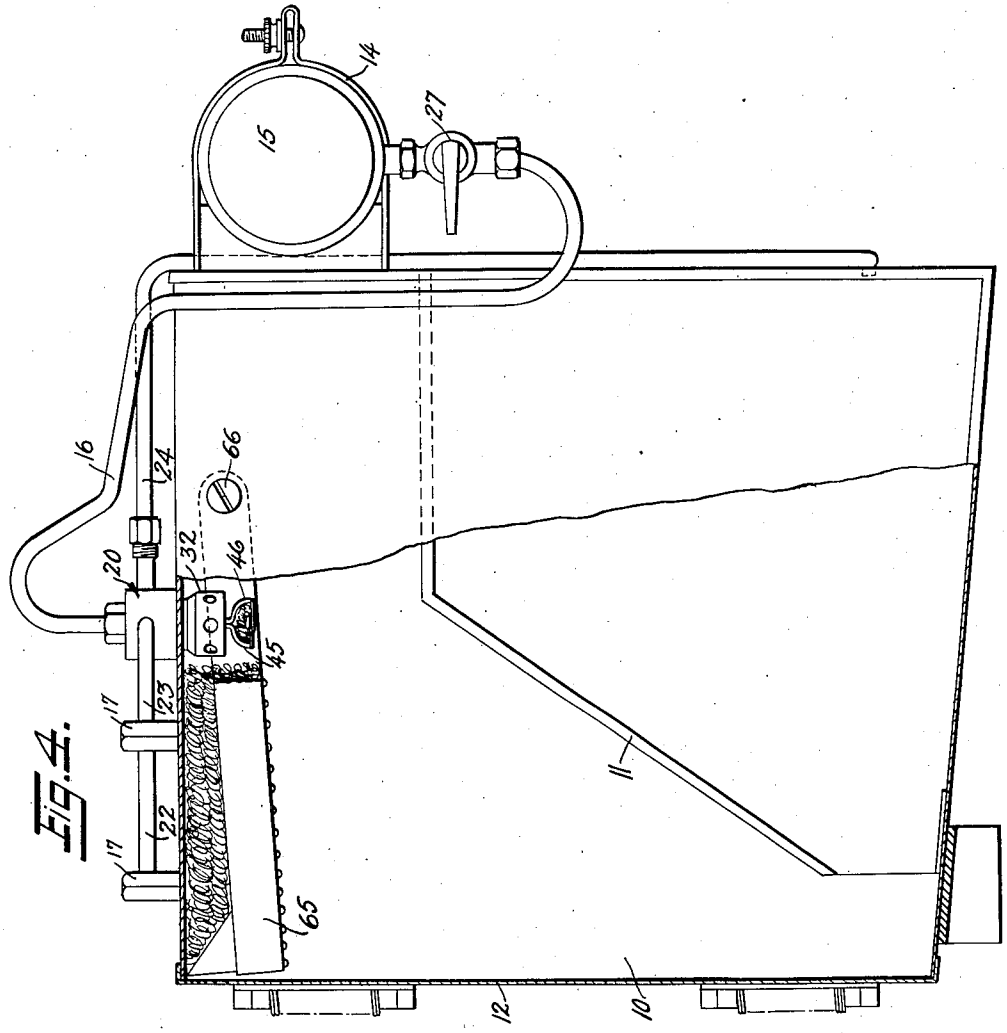


Fig. 4.

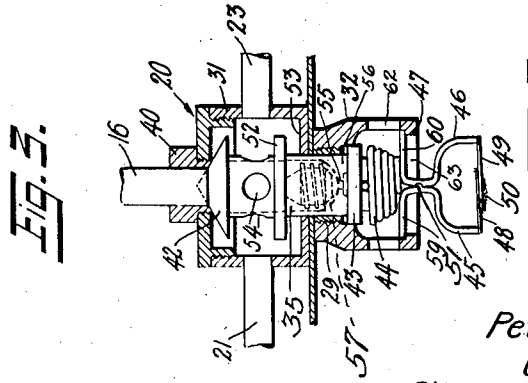


Fig. 3.

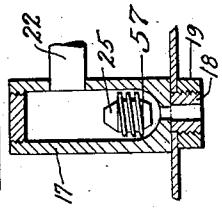


Fig. 5.

INVENTOR
Peter G. MacGregor
Geo. E. Ferguson
BY Lewis J. Doolittle
ATTORNEY

Patented Sept. 9, 1924. 1,507,745

UNITED STATES PATENT OFFICE.

PETER GRAHAM MacGREGOR, OF PEQUANNOCK, NEW JERSEY, AND GEORGE E. FERGUSON, OF SPRING VALLEY, NEW YORK, ASSIGNORS TO PYRENE MANUFACTURING COMPANY, A CORPORATION OF DELAWARE.

FIRE-EXTINGUISHING DEVICE.

Application filed February 17, 1922. Serial No. 537,164.

To all whom it may concern:

Be it known that PETER G. MacGREGOR and GEORGE E. FERGUSON, citizens of the United States, and residents, respectively, of Pequannock, Morris County, New Jersey, and of Moleston, Spring Valley, Rockland County, New York, have invented certain new and useful Improvements in Fire-Extinguishing Devices, of which the following is a specification.

This invention relates to fire-extinguisher attachments for receptacles containing highly-inflammable material, and is particularly adapted for use upon motion-picture film-holders. A holder of the latter type usually comprises a box-like receptacle partitioned off to accommodate several rolls of film. It is essential that a fire in such receptacle be extinguished with the greatest rapidity, for should the flames eat their way into the roll the large amount of oxygen present in the film material will support combustion despite efforts to extinguish it. It is an object of this invention, therefore, to provide the receptacle with a fire-extinguishing attachment which will respond instantly in the presence of heat or a flame in any part of the receptacle to extinguish the fire before it has made any substantial progress.

It is a further object to provide a device of the type described which can be applied to a receptacle with a minimum amount of effort and without material change or modification of the receptacle.

Other objects and advantages will hereinafter appear.

In the accompanying drawings:

Fig. 1 is a plan view of a holder for rolls of motion-picture film with the invention applied thereto.

Fig. 2 is a front elevation of the device shown in Fig. 1, the door of the receptacle having been removed to display the interior.

Fig. 3 is an enlarged detail vertically sectioned, of the thermally-controlled valve for distributing the fire-extinguishing liquid.

Fig. 4 is a side elevation of the device shown in Fig. 1, the side wall of the receptacle having been partly broken away.

Fig. 5 is an enlarged sectional detail view of the distributor head.

Referring to the drawings, there is shown a receptacle 10 which, in the present case, is a holder for rolls of film but which may be adapted for storing any inflammable material. The receptacle is usually box-like and divided by partitions 11 into compartments each of a size for receiving a roll of film. Access to the interior of the receptacle may be had by a hinged door 12 operated by a knob 13. Should any of the films catch fire, the flames would eat their way rapidly into the core of the roll and thereafter the large amount of oxygen present in the nitrocellulose of the film will support the combustion in spite of any efforts to extinguish it. It is therefore necessary to provide not only fire-extinguishing means, but also means for rapidly setting the same in operation as soon as flame starts or heat is generated.

For this purpose the fire-extinguishing fluid is contained in a tank 15 supported in any suitable manner, as by brackets 14, on the receptacle preferably at the rear thereof, a supply conduit 16 extending from said tank through a wall of the receptacle (here shown as the top wall). The fire may start in any part of the receptacle, and therefore there is provided a distributor valve 20 which, upon generation of heat or flame in any part of the holder, operates to permit the fire-extinguishing fluid to flow from the supply conduit 16 to a plurality of distributor conduits 21, 22, 23, 24. The conduits 21, 22, and 23 are shown terminating in heads 17 shown in detail in Fig. 5 having reduced ends 18 which are outwardly threaded, said reduced ends entering the top wall of the receptacle at various points and locked preferably by nuts 19 threaded upon said reduced ends, while the conduit 24 (see Fig. 2) extends downwardly along the back wall and is provided with outlets 26, one in each film compartment. Each of the heads 17 may be provided with a spirally grooved member 25 (Fig. 5) positioned in the hollow interior of the heads, whereby a whirling motion is given to the discharged fluid. It will, of course, be understood that any number of conduits suitably disposed may be employed. The fire-extinguishing fluid is under pressure in tank 15, said pressure being indicated upon gage 30, and the supply to the conduit 16 may be controlled by a valve 27. The supply of fluid to the distributor conduits is controlled by the distributor valve 20.

The construction of the distributor valve is shown in detail in Fig. 3, and comprises a chamber 31 fixed on the outer side of the top wall and a shell 32 threaded on a collar 29 fixed to the lower side of said wall. In the upper end of shell 32 operates a substantially cylindrical valve-member 35 which extends upwardly through openings in the shell, top wall, and chamber into said chamber 31. The conduits 21, 22, 23, 24 extend through the side wall of chamber 31. The latter is also provided with an opening in its top wall into which fits a plug 40 having an opening large enough to permit passage of the supply conduit 16. It will be obvious that if liquid is supplied to conduit 16 and the end of the latter is open, the liquid will discharge into chamber 31 and thence into the distributing conduits. Means are therefore provided whereby the end of conduit 16 is normally closed but which is opened upon a predetermined rise in temperature or the presence of flame in the surrounding medium.

For this purpose the end of conduit 16 is normally closed by the cone-shaped top 42 of valve-member 35, said valve-member resting upon a plate 43 and being held against the end of said conduit by a coil spring 44 pressing against said plate. The spring is supported in position by two members or levers 45 and 46, each of said levers being supported by their upper ends 59 and 60 upon a flange 47 on shell 32 and normally held against movement relative to each other by strips of metal 48 and 49 soldered together by low-fusing metal 50 and connecting the lower ends of said levers. One of the levers 45, 46 (here shown as lever 45) is provided with a ridge 51 normally seated in a corresponding groove in the other lever (here shown as lever 46) so that a toggle-joint is formed.

In operation, when the temperature of the surrounding medium rises above the melting-point of the low-fusing metal 50, the latter will yield and spring 44 will swing levers 45 and 46 about ridge 51 as a pivot so that ends 59 and 60 swing toward each other and allow levers 45 and 46, the spring 44 and plate 43 to drop out of shell 32. The tension of the spring being released, valve-member 35 will move away from the end of conduit 16 permitting the liquid to discharge into chamber 31 and thence into the distributor conduits. The movement of valve member 35 is limited by a flange 52 carried thereby engaging the bottom wall 53 of chamber 31. The valve-member may be provided above flange 52 with openings 54 so that liquid may also discharge into the valve-member which, being hollow, acts as a conduit similar to the distributor conduits. The valve-member is provided with opening 55 in its base 56 through which liquid discharges into shell 32 and thence through openings 62 and 63 in the shell into the receptacle. A spirally-grooved member 57 may be supported adjacent the base 56 of the valve-member whereby a whirling motion is given to the discharged fluid.

In order that the solder 50 may be fused as soon as flame or heat is generated in any part of the receptacle, there is provided a foraminous container in the form of a basket 65 hinged at 66 upon the side walls of the receptacle and which is supplied with gun-cotton. After filling, the basket is swung upwardly to effective position adjacent the solder 50. A piece of gun-cotton may also be inserted in the loop formed by the strips 48 and 49 and the levers 45 and 46. Heat or flame in any part of the receptacle will instantaneously ignite the gun-cotton in the basket which will in turn ignite the gun-cotton held by the strips and levers, and thus releases the valve 35—42 and causes the fire-extinguishing fluid to be discharged instantly.

By threading upon collar 29 another shell 32 having a plate 43, spring 44, and levers 45 and 46 soldered in position, the device is again ready for operation, the charge of gun-cotton having been renewed.

The above description illustrates a preferred embodiment of my invention but it will be understood that variations may be resorted to within the scope of the annexed claims.

Claims:

1. In combination with a receptacle for inflammable material, a tank containing fire-extinguishing fluid and mounted on said receptacle, a distributor valve mounted on said receptacle and extending therein, a supply conduit connecting said tank and valve, distributing conduits extending from said valve to various parts of said receptacle, thermally-controlled means normally effective to maintain said valve closed and prevent passage of fluid from said supply conduit to said distributing conduits, and means comprising a charge of gun-cotton positioned within the receptacle adjacent the thermally-controlled means adapted to be instantaneously ignited directly by the heat or flame generated in any part of the receptacle to permit the valve to open.

2. In combination with a receptacle for inflammable material, a tank containing fire-extinguishing fluid and mounted on said receptacle, a distributor valve mounted on said receptacle and extending therein, a supply conduit connecting said tank and valve, distributing conduits extending from said valve to various parts of said receptacle, thermally-controlled means normally effective to maintain said valve closed and prevent passage of fluid from said supply conduit to said distributing conduits, and

means comprising a charge of readily-inflammable material positioned within the receptacle adjacent the thermally-controlled means and a second charge of readily-inflammable material carried by said thermally-controlled means adapted to be instantaneously ignited directly by the heat or flame generated in any part of the receptacle to permit the valve to open.

3. In combination with a receptacle for inflammable material, a tank containing fire-extinguishing fluid and mounted on said receptacle, a distributor valve mounted on said receptacle and extending therein, a supply conduit connecting said tank and valve, distributing conduits extending from said valve to various parts of said receptacle, thermally-controlled means normally effective to maintain said valve closed and prevent passage of fluid from said supply conduit to said distributing conduits, and means comprising a foraminous container mounted within said receptacle adjacent the thermally-controlled means and readily-inflammable material positioned within said container adapted to be instantaneously ignited directly by the heat or flame generated in any part of the receptacle to permit the valve to open.

4. In combination with a receptacle for inflammable material, a tank containing a fire extinguishing fluid under pressure and mounted upon said receptacle, a distributor valve mounted in a valve chamber on said receptacle and extending thereinto, a supply conduit connecting said tank and valve chamber, distributing conduits extending from said valve chamber to various parts of the receptacle, thermally controlled means carried by a removable casing attached to said valve chamber and adapted to maintain said valve closed and prevent passage of the fluid from said supply conduit to said distributing conduits, said means including a pair of levers pivoted together to form a toggle-joint with their ends extending outside said casing and held together by a fusible solder at said extending ends, and means comprising a charge of readily-inflammable material positioned within said receptacle adjacent the extending ends of said levers adapted to be instantaneously ignited by the heat or flame generated in any part of the receptacle to release said levers and operate said thermally-controlled means to permit said valve to open.

5. In combination with a receptacle for inflammable material, a tank containing a fire-extinguishing fluid mounted on said receptacle, a distributor valve mounted in a valve chamber on said receptacle and extending thereinto, a supply conduit connecting said tank and valve chamber, a plurality of heads mounted on said receptacle and extending thereinto, distributing conduits extending from said valve chamber to said heads, each of said heads having a spirally-grooved member loosely carried therein adapted to cause a whirling motion to be imparted to the discharged fluid and to be distributed in a fine mist in the receptacle, thermally-controlled means adapted to normally maintain said valve closed, and means comprising a charge of readily-ignitable material positioned adjacent said means and adapted to be instantaneously ignited directly by heat or flame generated in said receptacle to cause said thermally-controlled means to release said valve.

Signed at New York city, in the county and State of New York, this 14th day of February, 1922.

PETER GRAHAM MacGREGOR.
GEORGE E. FERGUSON.