

July 31, 1928.

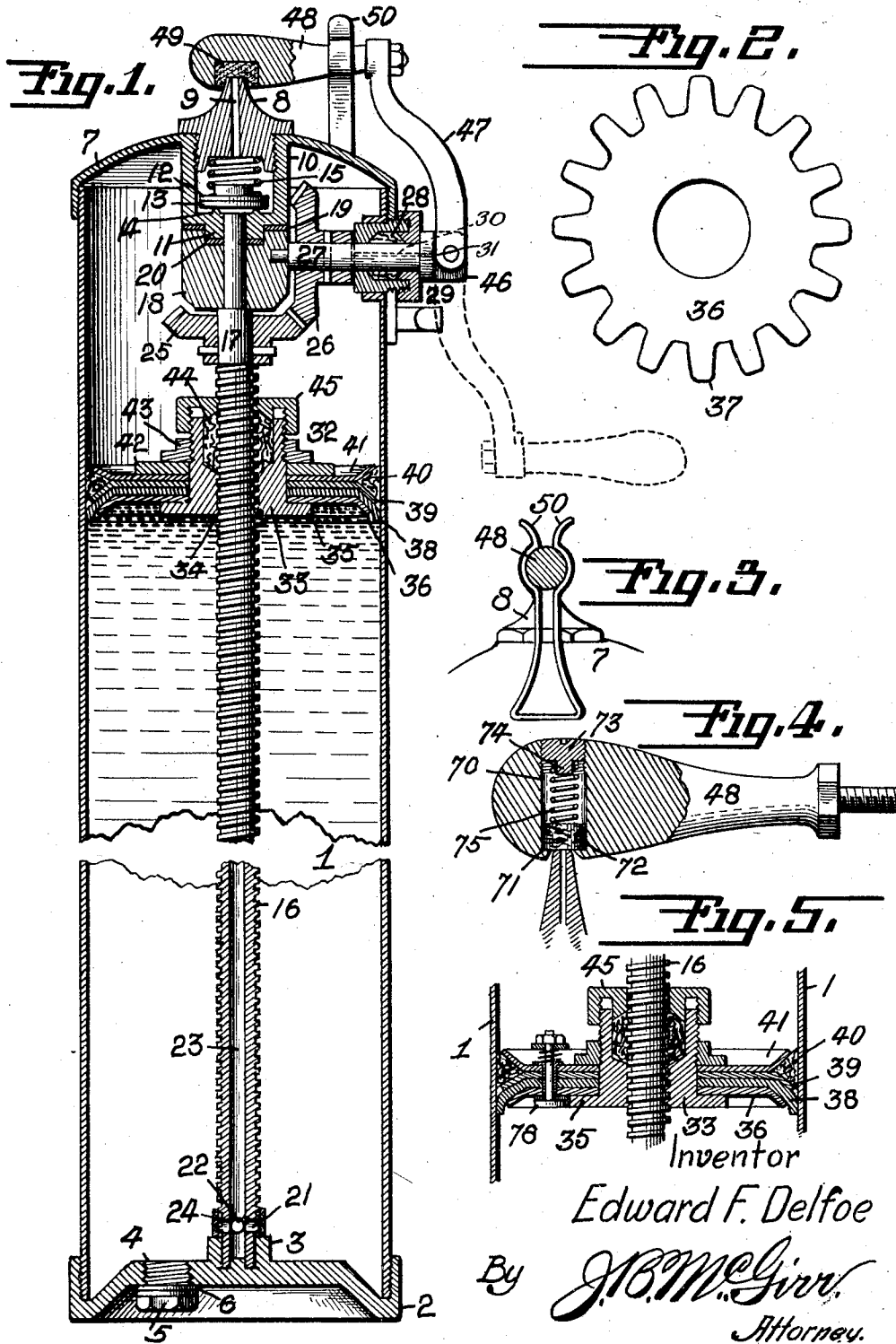
E. F. DELFOE

1,679,207

FIRE EXTINGUISHER

Filed Oct. 28, 1922

2 Sheets-Sheet 1



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**Fig. 6.**

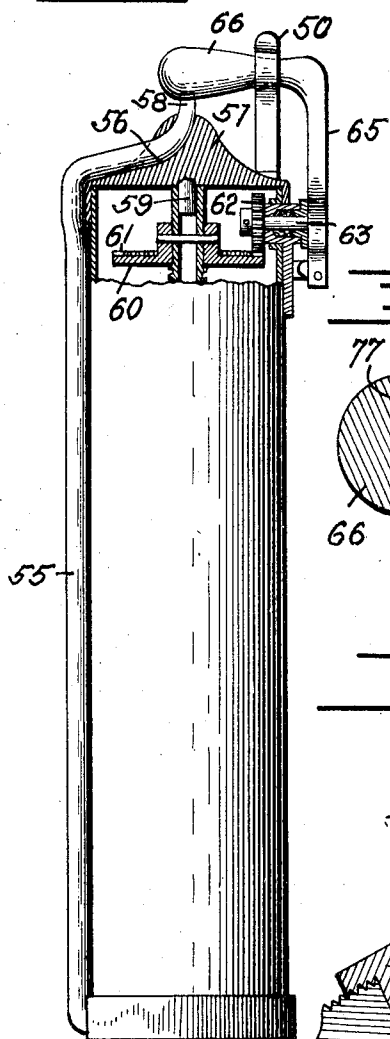


**Fig. 7.**

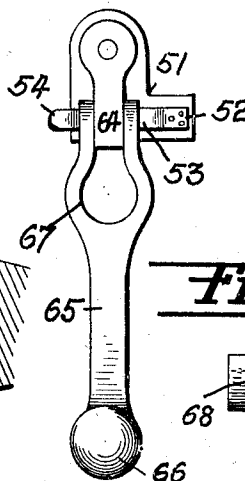


**Fig. 8.**

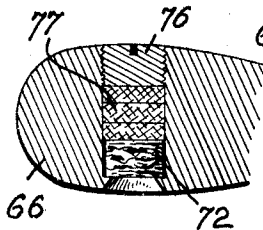


**Fig. 9.**

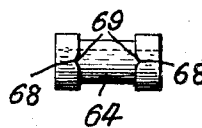


**Fig. 10.**

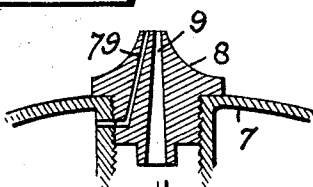
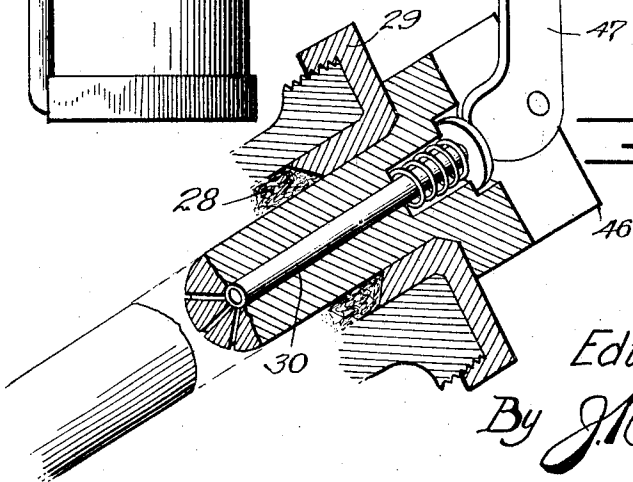


**Fig. 11.**



Inventor

Edward F Delfoe

By *J.B. McGirr*  
Attorney

## UNITED STATES PATENT OFFICE.

EDWARD F. DELFOE, OF BROOKLYN, NEW YORK.

## FIRE EXTINGUISHER.

Application filed October 28, 1922. Serial No. 597,492.

My invention relates to fire extinguishers and has for its object the provision of an improved device of this character. More especially, my invention has reference to an improved extinguisher for portable use and particularly to hand operated devices wherein fire extinguishing fluid is housed, also, the provision of novel means for spraying the fire with the contents.

Another object of my invention is to provide a fire extinguisher or container that will be cheap and durable, easy to manufacture and use, and one that may be easily operated. An extinguisher that will hold the fire quenching fluid without fear of leakage, corroding or otherwise becoming defective by evaporation or other means.

Yet another object of my invention is to be able to hold the container with one hand while operating a continuous flow of the fluid with the other, whereby the stream will be directed to the immediate flame.

With the foregoing and other objects in view, further objects and advantages will appear as the description of the invention is hereinafter developed.

Referring to the drawings wherein is illustrated what is now considered to be the preferred form of my invention;

Fig. 1 is a longitudinal section of my extinguisher;

Fig. 2 a top view of one of the disc plates;

Fig. 3 a detached detail of the spring lock for the handle when not in an operative position;

Fig. 4 a detail of a modified form, showing the seal for the nozzle;

Fig. 5 a detail of the piston, showing the valve therein;

Fig. 6 shows a modification of the container shown in Fig. 1;

Fig. 7 is another detail modification of the pivoted handle, also showing the counter shaft and bearing for same;

Fig. 8 is another modification of a closure for the nozzle;

Fig. 9 is a detail view showing a locking means for the handle when the same is in an operative position, and

Fig. 10 is a detail showing another means of permitting air to get behind the piston.

Figure 11 is an enlarged detail view of my needle valve.

In the drawings is illustrated a suitable container 1 which may be of the usual size and shape for use about the house, factory

or automobile or other such places where it may be conveniently placed for any emergency that may require its use. The container is provided with a suitable base 2, that may have a central bearing 3, and a filling port 4, which as shown may be closed by a nut 5 provided with a suitable washer 6 so as to prevent leakage. To the other end is secured a cap 7 provided centrally thereof with a nozzle 8, having a central bore 9. Below the nozzle is located a head 10, having on its under side a key 11. The head 10 is hollow and is provided with a spring actuated valve 12, the contacting face of which is provided with a vellumoid washer 13 which in turn rests on a seat 14 in the head 10 and a suitable spring 15 the lower end of which rests on the valve to keep it on its seat while the other end abuts the under side of the nozzle, thus providing a secure liquid tight valve when the extinguisher is not in use.

The container being formed of suitable tubing, provides an inner smooth wall over the face of which rides a piston, that will be described in detail further on. The base 2 and the cap 7 together with the tubing comprise the container 1. Intermediate the head and the base, and centrally located with respect to the container, is a hollow vertical threaded shaft 16, its lower end housed in the central bearing 3, while its upper reduced portion 17 is suitably housed in a bearing 18 which as above noted is interlocked with the head 10 by the key 11. Interposed between the head and the bearing are washers 19 and 20 so as to provide a leak proof joint between the two parts.

The hollow vertical shaft 16 at its lower end may be provided with suitable openings 21 and 22. These openings connect the interior of the container with the interior bore 23 of the hollow shaft, and about these openings it is preferred to place a screen 24 so as to prevent any clogging of the parts, by reason of sediment or other matter, getting through to the nozzle where it would seriously interfere with the proper working of the same. The shaft carries on its upper end a bevel gear 25, which meshes with a like gear 26 on a small shaft 27, one end of said shaft being housed in the bearing 18, while its other end extends through a stuffing box 28 which also acts as a bearing for that end of the shaft 27. Said shaft is provided with a double acting needle valve 30

(shown in dotted lines) which permits the air to enter the interior of the upper part of the container as the piston is forced downwardly, and this same valve permits the air to escape when the piston is raised to its upper-most position before refilling the container. The hand lever at its lower end is provided with a very slight cam 31, which when the lever is in its raised or nonoperative position securely holds the needle valve on its seat and will resist leakage.

Suitably located on the hollow shaft 16 is the operating piston 32, which preferably consists of a central body portion 33 provided with an internal thread 34, which corresponds to and fits the thread of the hollow shaft 16, and is adapted to operate up and down the same when the operating lever is turned. A shoulder 35 supports a safety disk 36 that may be provided as shown with downwardly extending fingers 37, and over which disk is supported a larger cup shaped disk of vellumoid or other suitable material 38. Said latter disk is backed up with another disk 39 in size and shape like the disk 36. Thus it will be seen that the two disks will cause the vellumoid disk 38 to retain its shape at all times and thereby fit closely to the walls of the container 1. Above the disk 39 is a ring 40 of triangular shape in cross section, and consisting of asbestos composition, which is preferably treated with glycerine, graphite or mica. Said ring is held in position by the disk 39 and another like disk 41, the latter disk having its outer edge or flanges upturned to conform to the upper face of the asbestos ring 40, and by which means said ring is held securely in place. While the several disks described may be provided, as above noted, with fingers 37, yet they will perform the same function with an upturned rim such as is shown in Figs. 1 and 5. These several disks are held in place by a washer 42, which in turn is held secure by a nut 43. The body portion 33 of the plunger is also provided with a suitable stuffing box 44, while 45 is the other member thereof. Thus it will be seen that the construction and arrangement of parts that go to make up the piston forms a moisture proof joint not only between the several disks, but between the upper and lower sides of the piston.

The shaft 27 may have a bifurcated head 46 to which may be suitably hinged a lever 47, the latter provided with a handle 48, and with an insert 49 therein of cork or other suitable material that will form a complete closure when the handle fits over and closes the end of the nozzle 8, while spring clips 50 form means for not only holding the handle in a non-operative position, but are of sufficient strength to hold said closure insert against the end of the nozzle and prevent any leakage or evaporation.

The herein illustrated rotary type of extinguisher permits the operator to steady the same against his body while holding or pointing the extinguisher in the direction of the blaze with one hand, and at the same time permits him to use all necessary force to turn the handle to operate the piston with the desired speed to cause a continuous spraying of the blaze with the fluid.

The bearing 29 is provided with a downwardly extending portion 51 (see Fig. 7) to which is secured a spring catch 52 having a nose 53, and a projecting portion 54 which when desired may be pressed down so as to permit the handle to be turned in the reverse direction for filling the container. By providing and locating this spring catch 52 in this position it prevents the handle from being turned in any other than the proper (or counter-clockwise) direction, when it is desired to cause the fluid to flow.

Again referring to Fig. 6, it will be seen that there appears a complete modification of the form shown in Fig. 1. In this form the container is provided with a pipe 55 extending from the lower part 2 of the container to the top, the same being suitably secured to the outside, and fitting within a groove 56 in the cap 57 where said pipe terminates into a central nozzle 58. The cap in this instance has depending from its under side a finger or lug 59 which fits the inner bore 23 of the hollow vertical threaded shaft 16, the lower end of said shaft being housed in the base 2 as shown in Fig. 1. The upper part of said shaft is shown as being provided with a flat disk 60 having teeth 61 about its upper circumference, and into which fits a wheel 62 on the shaft 63, the latter corresponding to the shaft 27 in Fig. 1. The shaft 63 has secured to its outer side a depending portion 64 to which is pivotally hinged the lever 65 the latter having a suitable handle 66 for operating the lever, while its lower end is provided with an aperture 67 so that when it is thrown over the top of the nozzle 58 it will be held secure by the spring clips 50, and the small projections 68 that are on the outer sides of the depending portion 64, while the lever 65 is provided at its pivoted point with corresponding depressions 69, which in no way interfere with the turning up or down of the lever 65, but do form a locking means to hold said handle and lever in one or the other of its positions.

Of course it will be understood that the handle 66 will be provided with a sealing means as shown in Fig. 4, wherein is shown a bore 70, its lower end forming a seat 71 on which is placed a cork or other suitable material 72. The other end of said bore is threaded and has secured therein a screw plug 73. The finger 74 centers a suitable spring 75, so as to afford proper tension of

the cork on the end of the nozzle. Another means that has been found advantageous for the same purpose is shown in Fig. 8, where the screw plug 76 presses upon one or more felt disks 77, which thereby provides suitable tension upon the cork 72 to securely seal the end of the nozzle.

Referring to Fig. 5, it will be seen that the piston is a duplicate of that shown in Fig. 1, only with the provision of a valve 78, so that the air may escape as the piston is being returned to its normal or upper position. Sufficient air escaping through the shaft 16 so as to allow of the perfect working of the piston downward when the lever 65 is being operated. When this form of piston is used, the double acting needle valve is not used, the escape of the air through the shaft 16 as above noted permits of the proper working of the device.

Again Fig. 10 shows a modification of the nozzle shown in Fig. 1, with the provision of an air inlet 79, which opens at the discharge end of the nozzle 8, while the other end of said inlet communicates with the interior of the container behind the piston. In this form, it will be seen when the seal 72 is over the nozzle, it not only closes one, but both of the openings and forms a compact secure seal from evaporation as well as leakage.

The novel means herein shown, whereby the piston is securely packed by the asbestos triangular ring 40 and which is held in its position by the disks 39 and 41 assists materially the preventing of leakage when the vellumoid disk 39 is forcing the liquid down and out through the hollow shaft.

In factories, homes, or other places where close up operation is effective, a slight riffling of the nozzle bore will have the effect to break the flow of solid liquid discharged therefrom into spray, thereby covering a much greater area, and having a much better flame quenching effect than if it were in a solid stream. By having the lever operated with a rotary motion, there is no jerky or unsteady directing of the liquid in the blaze as is the case with other styles.

While the extinguisher is designed to be held in an upright position, it will be understood that the same may if desired be held in an inverted position, as the various parts are proof against leakage. Again, the container may with its contents be placed anywhere desired in either position, with every assurance of safety.

In accordance with the provisions of the patent statutes I have herein described the principal forms of my invention which I now consider to represent the best embodiment thereof, but I desire to have it understood that the various forms are only illustrative and that the invention can be carried out in other ways than those shown and described, but all are intended to come with-

in the scope of the claims. Also, while the design of the extinguisher is shown in various forms, it may be changed or altered to meet the particular requirements without interfering in any way with the general results for which the extinguisher was designed.

Having described my invention what I wish to cover by Letters Patent, is:

1. In a fire extinguisher comprising a cylindrical body, the combination of a threaded hollow shaft therein, the interior of which communicates with the interior of the cylinder, a handle operatively associated with the shaft for rotating the same, a piston mounted on said shaft, and comprising a liquid proof cup held between metallic plates having yieldable outer edges and a triangular packing ring, said piston adapted to move on said shaft by a rotary movement of the handle to cause liquid to be forced through the shaft, a nozzle communicating with the hollow shaft, and means in said handle for closing and sealing the nozzle when the handle is in inoperative position.

2. In a fire extinguisher comprising a cylinder having a base secured to one end, a cap secured to the other end, a hollow head seated in the cap, a hollow vertical threaded shaft the interior of which communicates with the interior of the cylinder, and which shaft is held in position by said base and head, a piston on said shaft having a screw threaded hub provided with a plurality of plates between which is a liquid proof piston cup, and a triangular packing ring, means for holding the same secure to the piston, a nozzle carried by the head communicating with the hollow shaft for directing the flow of liquid, and a handle to rotate the hollow shaft for forcing the piston in an opposite direction to the flow of liquid.

3. In a fire extinguisher comprising a cylindrical body having a base and a cap secured thereto, a hollow head carried by the cap, the latter provided with a suitable nozzle, a hollow vertical threaded shaft having bearings in said head and base and communicating with the nozzle and the interior of the cylindrical body, said shaft having a piston operable thereon, a transverse shaft having a hinged lever, power transmission elements operatively connecting said transverse shaft with said hollow vertically arranged threaded shaft whereby said shafts are caused to be actuated simultaneously, the handle of said lever being adapted to fold and seal the free end of the nozzle when not in an operative position.

4. In a fire extinguisher comprising a cylinder having a base suitably secured thereto, a cap covering the upper end provided with a head and a nozzle carried by the head, a hollow vertical threaded shaft having bear-

ings in said base and cap and the interior of which communicates with the interior of the cylinder and nozzle, a piston movable on said shaft to force liquid from the cylinder therethrough to the nozzle, and having a hub operable upon said shaft, disks mounted on said hub having outwardly flaring fingers holding secure a liquid cup and between others a triangular packing ring, means for locking the several parts in position to prevent leakage about their edges, a transverse shaft having a hinged lever, the handle of which is adapted to fold over and seal the free end of the nozzle when not in an operative position, and power transmission elements operatively connecting said transverse shaft with said hollow vertically arranged threaded shaft whereby said shafts are caused to be actuated simultaneously.

5. In a fire extinguisher comprising a cylinder provided with closures at its upper and lower ends, said upper end closure constituting a cap, a head formed on said cap, a hollow threaded shaft, the interior of which communicates with the interior of the cylinder operably supported in bearings at its upper and lower ends, a bearing block carried by said shaft, said block held in position by the head which forms part of the cap, the latter provided with a nozzle that has communication with the hollow shaft, a piston on said shaft, a handle for operating said shaft and piston and said handle operatively associated with said threaded shaft and provided with a suitable yielding closure which when in an inoperative position of the handle acts as a seal to the nozzle.

6. In a fire extinguisher comprising a cylinder provided with sealed closures at the upper and lower ends, a head, a nozzle carried by the head, a hollow shaft having openings communicating with the interior of the container and nozzle, a bearing block carried by said shaft interlocking with the head, a transverse shaft, a lever hinged to said transverse shaft provided with means for sealing the free end of the nozzle when in an inoperative position, and provided with means for imparting a rotary motion to the shaft when in its extended position, and a piston carried by said hollow shaft adapted to force the liquid within the container through the hollow shaft and nozzle.

7. In a fire extinguisher of the character

described, the combination of a container provided with a cap, a nozzle carried by the cap, a base with a filling port, a hollow vertical shaft the interior of which communicates with the interior of the cylinder and with the nozzle, means for operatively holding said hollow vertical threaded shaft, a piston on said shaft, a transverse shaft, gears connecting both shafts, a hinged lever mounted on said transverse shaft, a handle carried by the same, said lever and handle adapted to be locked in a non-operative position, the handle having therein yieldable packing means for sealing completely the opening in the nozzle carried by the cap of the container, and means whereby when in an operative position the handle may only be operated in one direction to cause the extinguisher to discharge its contents.

8. In a fire extinguisher of the character described, the combination of a container, a nozzle, means for operatively holding in said container a hollow vertical threaded shaft, channels between the interior of the shaft and the container and the nozzle, a piston on said shaft having metallic and composition disks, a triangular packing ring carried by said metallic disks, a hinged lever, and a handle carried therewith for revolving said hollow shaft, said handle adapted to be snapped under spring clips when in an inoperative position to retain same, and means in said handle for closing and sealing the nozzle when the handle is in an inoperative position.

9. In combination, a container having a nozzle, a hollow rotatable vertical shaft suitably held therein and the interior of which communicates with the interior of the container and the nozzle, a piston carried by said vertical shaft and movable upon rotation thereof to force the liquid in an opposite direction to its movement, means for revolving the hollow shaft, and a handle swingably mounted on said means, said handle adapted to be moved to one position above said container and engaging upon said nozzle to close the same, and to another position alongside of said container for manual operation to rotate said means.

In testimony whereof I have affixed my signature.

EDWARD F. DELFOE.