Oct. 10, 1950 T. C. WEISS ET AL 2,525,742

FIRE EXTINGUISHER

Filed Oct. 14, 1948 2 Sheets-Sheet 1

Fig. 1.

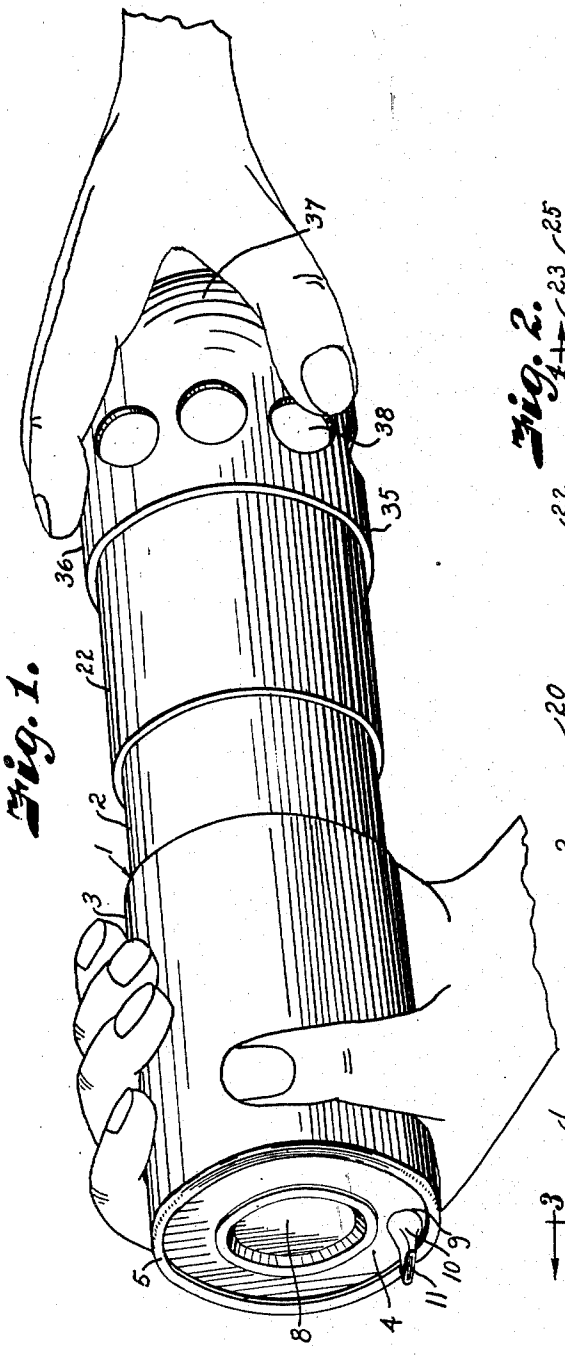
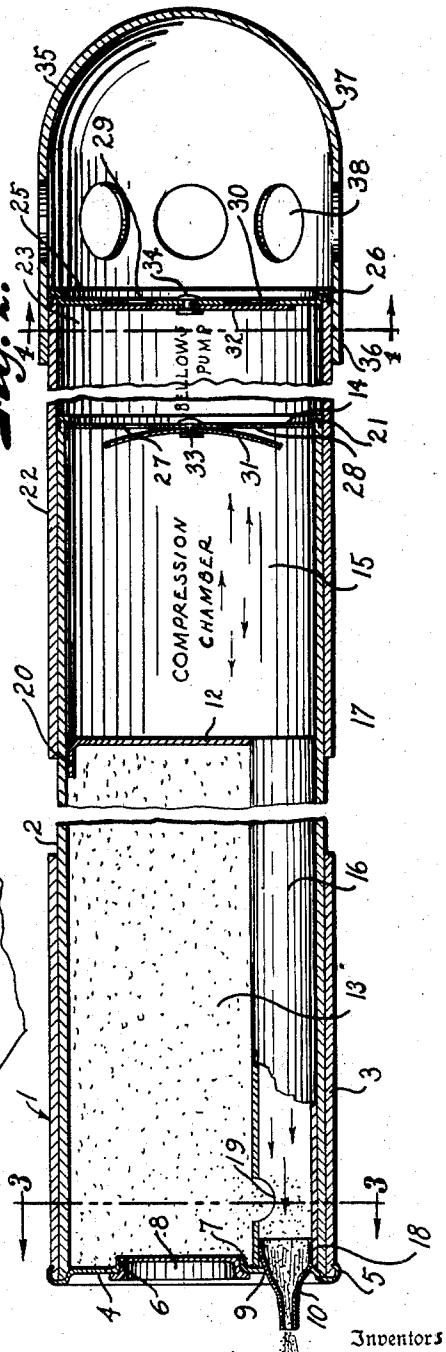


Fig. 2.



Inventors
Sam King and
Thomas C. Weiss

By
Fishburn & Mullendore.
Attorneys

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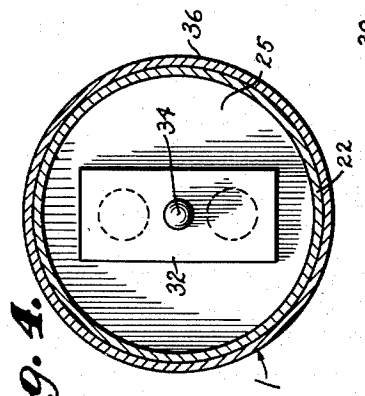


Fig. 4.

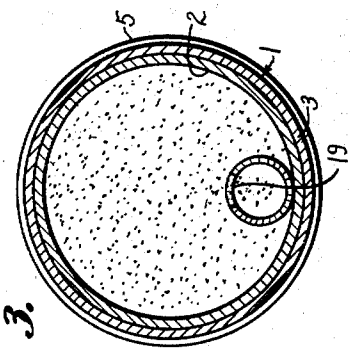


Fig. 3.

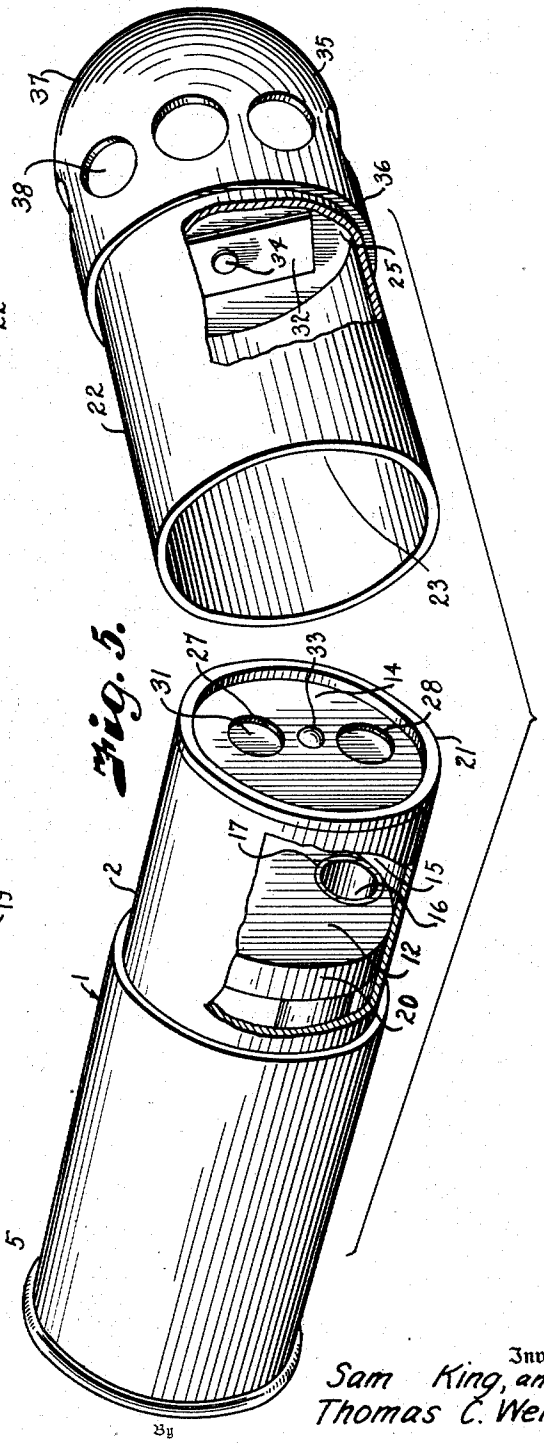


Fig. 5.

Inventors
Sam King, and
Thomas C. Weiss.

By
Fishburn & Mullendore
Attorneys

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FIRE EXTINGUISHER

Thomas C. Weiss, Oklahoma City, and Sam King, Bethany, Okla.

Application October 14, 1948, Serial No. 54,414

7 Claims. (Cl. 169—33)

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This invention relates to fire extinguishers particularly of the type for discharging a powder form of fire extinguishing chemical and has for its principal object to provide a device of this character that is of simple and inexpensive construction so that it may comprise the package in which the chemical is merchandised, thereby providing a convenient and readily available fire fighting unit.

Another object of the invention is to provide a structure whereby the chemical is discharged in a substantially continuous and controlled stream under a substantially uniform pressure by reason of an air storage chamber in cooperation with a bellows type pump, all incorporated into a single unitary device.

In accomplishing these and other objects of the invention hereinafter pointed out, we have provided improved structure, the preferred form of which is illustrated in the accompanying drawings wherein:

Fig. 1 is a perspective view of a fire extinguisher embodying the features of the present invention and showing the manner of using the same.

Fig. 2 is a longitudinal section through the device, particularly illustrating the chemical, compression and bellows chambers.

Fig. 3 is a cross section on the line 3—3, Fig. 2.

Fig. 4 is a cross section on the line 4—4, Fig. 2, to illustrate the bellows pump valve.

Fig. 5 is a perspective view of the parts of a fire extinguisher, portions being broken away to better illustrate the interior construction.

Referring more in detail to the drawings:

1 designates a fire extinguisher in the form of a package unit and which includes a tubular body 2 reinforced at its forward end by an encircling sleeve 3. The tubular body 2 may be formed of cardboard or other inexpensive material that is not affected by the chemical to be used therein and if desired the material used may be suitably treated to exclude moisture and prevent deterioration of the chemical.

The outer reinforced end of the tubular body is closed by a head 4 that may be formed of a sheet metal disk or other material having its peripheral edge secured to the tubular body by crimping or the like as indicated at 5. The head 4 has a suitable filler opening 6 reinforced by an inwardly extending flange 7 and which is normally closed by a plug-like cap 8. The head 4 also has an opening 9 through which a discharge nozzle 10 projects. The nozzle is preferably formed of tubular material flattened on its exterior end to form a relatively wide discharge

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opening 11 for spreading the chemical that is discharged therethrough. Inset from the opposite end of the tubular body is a partition 12 to cooperate with the head 4 and wall of the body in forming chemical containing chamber 13 and to cooperate with a head 14 that closes the rear end of the tubular body to form a compression chamber 15 in tandem relation with the chamber 13. Extending longitudinally within the tubular body immediately adjacent the side wall thereof is an air duct 16 having an inlet end 17 connected with the compression chamber and a connection 18 with the nozzle 10 as best shown in Fig. 2.

The duct may be formed of any suitable material and has a lateral port 19 located adjacent the nozzle to provide for inlet of chemical from the chamber 13 to be discharged with an air blast through the nozzle as later described.

The partition 12 is preferably secured in position by providing the periphery thereof with a flange 20 that may be suitably cemented or otherwise attached to the wall of the tubular body 2. The head 14 may be formed of thin metal or the like and crimped in position to the rear end of the tubular body as indicated at 21 so as to provide a relatively leak-tight joint and maintain air in compression within the chamber 15 when the air pump is operated as later described.

The air pump comprises a sleeve-like piston 22 that is reciprocably mounted on the tubular body over the compression chamber and is of sufficient length to provide ample guide on the tubular body when the sleeve is moved to its retractive position to expand the bellows chamber 23 that is formed between the head 4 and a head 25 that is attached to the rear end of the tubular piston. The head 25 may also be attached. The piston may also be formed of cardboard similar to the tubular body and fits sufficiently tight thereto so as to prevent leakage of air, by crimping or the like indicated at 26. The heads 14 and 25 are provided with one or more ports, for example, a pair of ports 27—28 and 29—30, respectively so as to provide for entrance of air into the bellows chamber and discharge of air into the compression chamber.

The pairs of ports are normally closed by valves 31 and 32, each comprising a strip of spring-like or other resilient material of ample size to cover the ports. The valves are secured to the respective heads by fastening devices such as rivets 33 and 34.

In order to eliminate possible closure of the openings 29 and 30 by the hand when the de-

vice is operated, the rear end of the tubular piston is provided with a guard 35 having an annular wall portion 36 extending over and suitably secured to the rear end of the tubular piston and having a substantially semispherical head 37.

The periphery of the wall portion 36 is provided with a circular series of openings 38 of ample capacity to provide for sufficient inlet of air even though several of the openings may be closed by the hand during operation of the device. If desired each port may be as large or larger than the effective area of the air inlet ports.

In using the device, the chemical is inserted through the opening 6 which, after filling is closed by the cap 8. The tubular piston is pushed over the rear end of the tubular body until the forward end thereof abuts against the rear end of the reinforcing sleeve 3 so that the device is at its shortest length for packaging. The unit is then ready for sale as a complete unit containing the fire extinguishing chemical.

When the device is to be used, the reinforcing sleeve is engaged by one hand while the guard 35 is gripped by the other so that the tubular piston may be retracted along the tubular body to enlarge the bellows chamber 23. This action causes the valve 31 to close the ports 27 and 28 by reason of the greater pressure in the pressure chamber brought about by formation of a partial vacuum within the bellows chamber and the valve 32 to open the ports 29 and 30 by rush of air into the bellows chamber for filling the vacuum. The tubular piston is then pushed in the opposite direction to force the air through the ports 27 and 28 into the compression chamber. Reciprocation of the tubular piston is continued to build up pressure within the compression chamber wherefrom a substantially continuous stream of air is discharged through the tube 16 to the nozzle. During discharge of air powdered chemical is drawn through the port 19 from the storage chamber 13 and discharged in dust form from the nozzle discharge port 11.

The device may be used until the fire is extinguished or until the supply of chemical is exhausted. After use the empty unit may be thrown away and replaced with a filled unit.

From the foregoing it is obvious that we have provided a fire extinguisher for dispersing powdered chemical that is of simple and inexpensive construction and which may serve as the container in which the chemical is merchandised.

What we claim and desire to secure by Letters Patent is:

1. A fire extinguisher including a tubular body member having separate chemical and compression chambers, a discharge nozzle on said body, a common air and chemical discharge duct connecting the compression chamber with the nozzle and having an opening in connection with the chemical chamber for withdrawing chemical by aspirating effect of air which is adapted to escape through said duct from the compression chamber and discharged through the nozzle, and pump means connected with said compression chamber to supply air to said compression chamber.

2. A fire extinguisher including a tubular body member having separate chemical and compression chambers, a discharge nozzle on said body, a common air and chemical discharge duct connecting the compression chamber with the nozzle and having an opening in connection with the chemical chamber through which chemical is drawn by aspirating effect of air which is adapted to escape through said duct from the compression chamber and discharged through the nozzle, a tubular piston slidable on the tubular body and cooperating therewith in providing an expandable and contractable bellows chamber, said bellows chamber having a discharge port connected with the compression chamber and said tubular piston having an inlet port, and valves for alternately closing said ports responsive to reciprocation of the tubular piston on said body member.

3. A fire extinguisher including a tubular body member having separate chemical and compression chambers, a discharge nozzle on said body, a common air and chemical discharge duct connecting the compression chamber with the nozzle and having an opening in connection with the chemical chamber through which chemical is drawn by aspirating effect of air which is adapted to escape through said duct from the compression chamber and discharged through the nozzle, a tubular piston slidable on the tubular body and cooperating therewith in providing an expandable and contractable bellows chamber, said belows chamber having a discharge port connected with the compression chamber and said tubular piston having an inlet port, valves for alternately closing said ports responsive to reciprocation of the tubular piston on said body member, and a guard covering the inlet port.

4. A fire extinguisher including a tubular body member having separate chemical and compression chambers, a discharge nozzle on said body, a common air and chemical discharge duct connecting the compression chamber with the nozzle and having an opening in connection with the chemical chamber through which chemical is drawn by aspirating effect of air which is adapted to escape through said duct from the compression chamber and discharged through the nozzle, a tubular piston slidable on the tubular body and cooperating therewith in providing an expandable and contractable bellows chamber, said bellows chamber having a discharge port connected with the compression chamber and said tubular piston having an inlet port, valves for alternately closing said ports responsive to reciprocation of the tubular piston on said body member, and a tubular guard sleeved over the tubular piston in protecting relation with the inlet port, said guard having a series of openings for admitting air to the inlet port.

5. In a fire extinguisher a body member, a tubular member, a tubular piston slidable on the body member and cooperating therewith in providing an expandable and contractable bellows chamber, said bellows chamber having a discharge port and said tubular body having an inlet port, valves for alternately closing said ports responsive to reciprocation of the tubular piston on said body member, and a tubular guard connected with tubular piston in protecting relation with the inlet port and having a series of openings for admitting air to the inlet port.

6. A fire extinguisher including a tubular body member having separate chemical and compression chambers, a discharge nozzle on said body, an air discharge duct connecting the compression chamber with the nozzle and having an opening in connection with the chemical chamber through which chemical is drawn by aspirating effect of air which is adapted to escape through said duct from the compression chamber and discharged through the nozzle, a tubular piston slidable on the tubular body and cooperating therewith in

providing an expandable and contractable bellows chamber, said bellows chamber having a discharge port connected with the compression chamber and said tubular piston having an inlet port, valves for alternately closing said ports responsive to reciprocation of the tubular piston on said body member, and a tubular guard on the tubular piston in protecting relation with the inlet port and having a series of openings for admitting air to the inlet port, anyone of said openings having at least the effective capacity of the inlet port.

7. A fire extinguisher including a tubular body member having separate chemical and compression chambers, a discharge nozzle on said body, a common air and chemical discharge duct for connection with the compression chamber and extending through the chemical chamber for direct connection with the nozzle, a portion of the duct extending through the chemical chamber and having an opening through which chemical is drawn by aspirating effect of air discharged through said duct through compression chamber, a tubular piston slideable on the tubular body and cooperating therewith in providing an expandable and contractable bellows chamber, said tubular piston having a head portion provided with an air inlet opening and said compression chamber having a head provided with an air discharge opening connecting the compression chamber with the bellows chambers, valves for alternately closing said opening responsive to reciprocation of the tubular piston on said body member and a tubular guard on the tubular piston in protecting relation with said air inlet opening and having a series of openings for admitting air to the inlet port.

THOMAS C. WEISS.
SAM KING.

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