

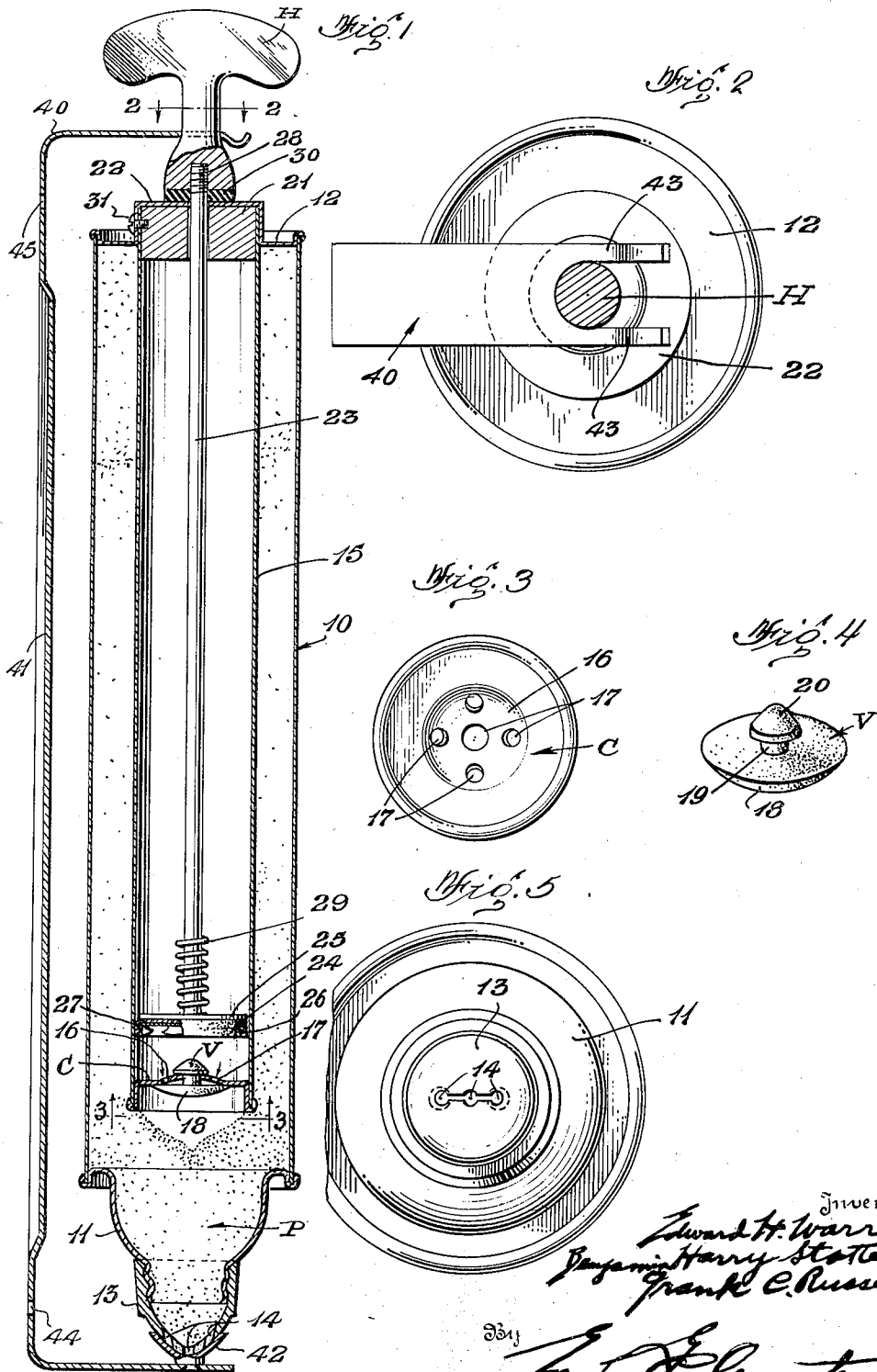
June 20, 1939.

E. H. WARR ET AL

2,163,477

FIRE EXTINGUISHER

Filed Dec. 1, 1937



Inventor
Edward H. Warr
Benjamin Harry Stotter
Frank C. Russell

By *Wm. E. Clements* Attorney

UNITED STATES PATENT OFFICE

2,163,477

FIRE EXTINGUISHER

Edward H. Warr, Benjamin Harry Stotter, and
Frank C. Russell, Baltimore, Md.

Application December 1, 1937, Serial No. 177,580

4 Claims. (Cl. 169—33)

This invention relates to a fire extinguisher and more particularly to a fire extinguisher of the hand actuated type in which powder is utilized as the fire extinguishing medium.

5 Prior to my invention, many types of hand operated fire extinguishers have been known but such devices have been cumbersome, relatively difficult to operate, subject to jamming, contain many parts, and are relatively expensive to fabricate. Those extinguishers which have been 10 so constructed as to operate satisfactorily, invariably have incorporated in their construction accurately machined parts, or parts otherwise difficult to produce, which are relatively expensive to manufacture. These difficulties have pre- 15 vented the wide use of this type of extinguisher.

It is an object of the invention to provide a fire extinguisher of few parts, of simple, inexpensive, and foolproof construction as well as an 20 extinguisher that is commercially practicable.

Other objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawing, wherein:

25 Fig. 1 is a reduced longitudinal section of a fire extinguisher and supporting bracket therefor illustrating one application of the invention;

Fig. 2, a section on line 2—2 of Fig. 1;

30 Fig. 3, a section on the line 3—3 of Fig. 1 showing the discharge end of the pump cylinder with the flexible valve removed;

Fig. 4, a perspective of the resilient valve; and

Fig. 5, a plan view of the discharge end of the 35 extinguisher.

35 Referring to the drawing, the fire extinguisher comprises an outer casing or body portion 10 cooperating directly with a substantially funnel shaped or frusto-conical end portion 11 which forms the discharge end of the extinguisher. 40 The other end of body portion 10 may be provided with a closure 12. The substantially frusto-conical end portion 11 may be of metal or the like and is preferably provided with a tip 13 of a dissimilar material, such as for example rubber 45 composition or the like. The difference in materials serves to eliminate corrosion and the accompanying undesired bond between the elements which prevents their being separated. The tip 13 may be provided with discharge orifices 14 50 which are set at a slight angle to the axis of the casing to form a focal point, not shown, in order to direct in a better manner the fire extinguishing powder P discharged.

55 Within the casing 10 and in concentric relation thereto is mounted a pump cylinder 15 hav-

ing a discharge end provided with a valve V spaced inwardly of the end of the cylinder so that a clear space is provided to prevent interference of the powder with the valve mechanism. As shown a cup shaped element C, see Fig. 3, is 5 pressed into the end of the pump cylinder 15, said element being provided with a curved portion 16 having orifices 17 formed therein. The orifices 17 may be symmetrically or asymmetrically arranged and include a center orifice and four or 10 more side orifices as depicted in Fig. 3. These orifices are arranged to be closed by valve body V which may be fabricated of rubber or other flexible material substantially rivet shaped, com- 15 prising a head 18, see Fig. 4, an axial stem portion 19, and a valve stop 20. This valve stop 20 is so arranged as to permit its being forced through the center orifice of the orifices 17, the axial stem 19 filling the center orifice and hold- 20 ing the head 18 in operative relation to close the valve orifices 17. With the above recited construction, negative pressure above the valve body will permit air to be exhausted from the pump cylinder 15 but will exclude powder from the 25 pump cylinder.

The upper ends of cylinder 10 and pump cylinder 15 are capped by closure 12. An internal disc 21 within the upper end of cylinder 15 formed of suitable material, such as wood or the like, is provided with an external cap 22 to form the 30 head of the fire extinguisher. A pump rod 23 is arranged to extend through said disc and cap and is provided at its lower end with a piston 24 comprising a metal disc 25, a leather cup pack- 35 ing 26, and a resilient packing spreader 27 whereby the piston 24 in cooperation with cylinder 15 and valve V will operate on its downward stroke to force air through the orifices 17 in cup member C past the head 18 of the valve V, forcing the 40 fire extinguishing powder P through discharge orifices 14 on to the fire to be extinguished. On the up stroke of the piston 24 the leather cup packing does not effect a seal between the piston 24 and the cylinder 15 and permits air to enter that portion of the cylinder between the piston 45 24 and the cup element C.

To facilitate operation of the device, a suitable handle H may be secured to the rod 23 in any suitable manner as for example by screw 50 threads 28. A spring 29 may be provided at the lower portion of the rod 23 with one of its ends bearing against piston 24 whereby on the upward stroke of the piston 24 the spring 29 will engage the lower portion of the internal disc 21 and act as a shock absorber. Similarly a rub- 55

ber washer 30 may be arranged about the rod 23 between the external cap 22 and the handle H whereby shock may be absorbed on the downward stroke of the piston 24. The cap 22 may be suitably secured to the device by screw 31 which may enter the disc 21.

It is often convenient to have a fire extinguisher secured to a convenient wall whereby it may be readily demounted therefrom and put into play in emergencies. A wall bracket 40 for so mounting my fire extinguisher may comprise a U-shaped stamped sheet metal bracket 41 having a generally cone shaped nozzle supporting piece 42 secured thereto at its lower end, one of the legs of the U, and a bifurcated portion 43 at the upper end of the bracket, the other leg of the U, for cooperation with a handle H of the fire extinguisher whereby the fire extinguisher is suitably securely mounted on said bracket and yet readily demountable therefrom for quick action in an emergency should one occur. The bracket 40 may be punched to provide holes 44 and 45 in the vertical portion of the bracket, the lower portion of the U, whereby said bracket may be secured to a convenient wall by suitable means such as screws.

It will be obvious to those skilled in the art that various changes may be made in this device without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawing and described in the specification but only as indicated in the appended claims.

We claim:

1. A dry powder fire extinguisher comprising a pair of elongated cylinders, a nozzle cooperating with the outer of said cylinders which forms a container for a quantity of fire extinguishing powder, the inner cylinder having a recessed inner end wall providing with the cylinder walls an open ended chamber, said recessed wall having an aperture providing communication between said chamber and inner cylinder, a piston slidably mounted in said inner cylinder, and an all rubber check valve carried by said recessed wall and cooperating therewith to normally close the aperture therein, said cylinders and chamber being arranged in normally vertical, concentric relation to each other whereby air may be forced by said piston through said valve controlled aperture and into said open ended chamber for expansion against the body of fire extinguishing

powder normally disposed there beneath for the forceable discharge of said powder through said nozzle concentrically arranged with respect to said chamber.

2. The structure defined in claim 1 in which said nozzle is provided with a plurality of orifices and said orifices are arranged to converge to a focal point there beyond.

3. The structure defined in claim 1 in which the recessed end wall is centrally indented to provide a dome-shaped portion of materially less diameter than said wall having an aperture therein communicating with the open ended chamber on one side and the inner cylinder on the other, and an all rubber valve anchored adjacent its center to said indented portion and having a radially extending flat underside spanning said portion with its periphery in normally sealing engagement with the wall there beyond.

4. A dry powder fire extinguisher comprising a pair of elongated concentric cylinders, a nozzle cooperating with the outer of said cylinders which forms a container for a body of fire extinguishing powder, the inner of said cylinders having its inner end longitudinally spaced a substantial distance from the inner end and nozzle of the other cylinder to provide therebetween an unobstructed space for the accumulation of fire extinguishing powder, and an open ended compression chamber formed in the inner end of said cylinder, said chamber comprising a cup-shaped body having a relatively flat inner wall provided with a centrally disposed indentation which is substantially dome-shaped in cross section, apertures formed in said indented wall portion providing communication between said inner cylinder and chamber, a substantially rivet-shaped all rubber valve having its central stem anchored in an aperture in said wall and the flat underside of its head spanning said indented portion for normally sealing engagement with the wall there beyond, and a piston in said inner cylinder and cooperating with said bottom wall and check valve to compress air within said open ended compression chamber and against the body of fire extinguishing powder disposed between said chamber and nozzle in said outer cylinder for the forcible discharge of said powder through said nozzle.

FRANK C. RUSSELL.
EDWARD H. WARR.
BENJAMIN HARRY STOTTER.