Jan. 8, 1963 W. F. HART 3,071,872

FIRE TRAINING STRUCTURES

Filed March 21, 1960

FIG. 4

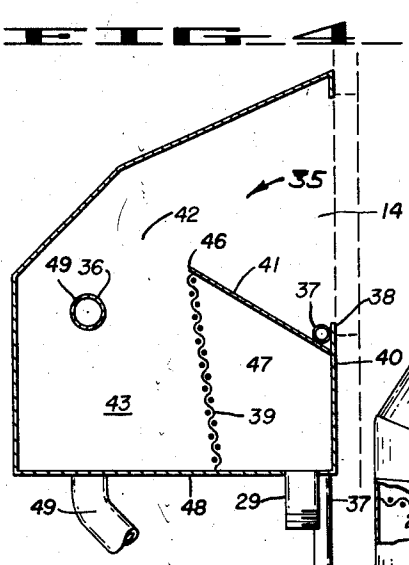
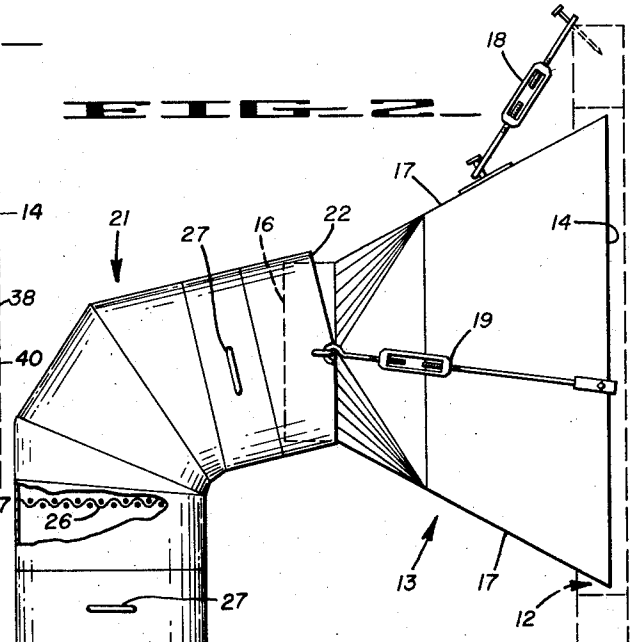


FIG. 2



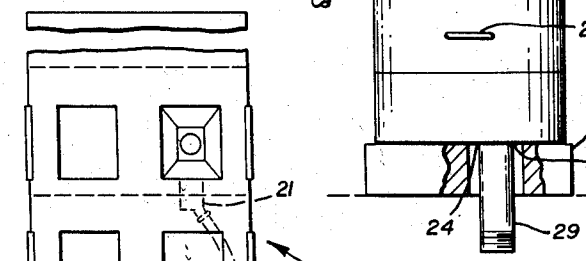


FIG. 3

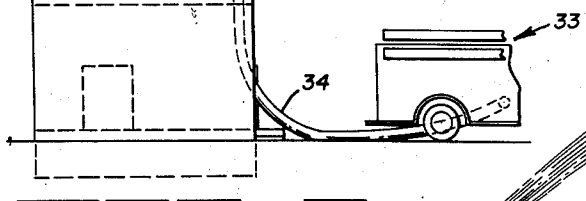


FIG. 1

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FIRE TRAINING STRUCTURES

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This invention relates to new and useful improvements in fire training structures; for example fire department drill towers, which are used by fire fighting personnel to learn fire fighting techniques. To train personnel to control fire hoses under high pressure and to develop their accuracy with respect thereto as well as to familiarize men with the various types of nozzles and other fire fighting equipment, particularly with reference to structures, it is necessary to actually spray water into the interior of the structure. Also, it is common practice for fire departments to store materials and equipment in the drill tower, thus precluding the spraying of large quantities of water into the interior thereof. Moreover, the high cost of water in many areas prohibits the use of large quantities of water in training.

Hence, one of the objects of my invention is to provide a fire training structure, such as a drill tower, with a system to allow water to be sprayed into the interior thereof under high pressure without damaging the interior of the structure or property contained therein.

Another object of my invention is to provide a fire training structure, such as a drill tower, with a system which will allow water sprayed therein to be captured and returned to its source making it available for re-use.

Another object of my invention is to provide a fire training structure, such as a drill tower, with a system which may be utilized in conjunction with various openings in the structure and at various elevations so that water spraying techniques may be perfected from different angles and at different elevations.

Another object of my invention is to provide a fire training structure, such as a drill tower, with a system which will allow fire fighting personnel to develop accuracy and control in spraying water under high pressure using different nozzles.

Further objects and advantages of my invention will appear as the specification proceeds, and the novel and useful features thereof will be fully defined in the claims attached hereto.

The preferred embodiments of my invention are illustrated in the accompanying drawings, forming parts of this application, in which:

FIGURE 1 is a diagram of a drill tower.

FIGURE 2 is a side view of the funnel and reservoir employed in my invention, a portion of which is broken away to show the interior of the reservoir.

FIGURE 3 is a view of a portion of a drill tower and a diagram showing an alternative conduit from the reservoir.

FIGURE 4 is a cross section of an alternative form of funnel and reservoir.

While I have shown only the preferred forms of my fire training structure, it should be understood that various changes and modifications may be made within the scope of the claims attached hereto, without departing from the spirit of my invention; also, it is to be understood that the system herein defined may be constructed with the fire training structure or installed in an existing structure.

Referring to the drawings, in FIG. 1, the numeral **11** indicates a drill tower having one or more windows **12**. The numeral **31** indicates a sump with a hose **32** extending therefrom so as to provide a means for pumping water from the sump **31** into the suction side of a pumping device which is shown by the numeral **33**. Numeral **45** represents a hose leading from the pressure side of the pumping device **33**. Numeral **20** indicates a vertical standpipe positioned in the drill tower **11** and running to the top floor thereof. As shown the vertical standpipe empties into the sump **31**.

The numeral **13** designates a funnel having open ends **14** and **16**. One open end **14** of said funnel **13** is constructed to correspond with the size and shape of the window opening **12**. The opposite open end **16** of said funnel **13** is cylindrical. The taper of the inner walls **17** of the funnel **13** is toward the cylindrical open end **16**. I have found that a spray of water in the magnitude of 600 gallons per minute can be satisfactorily captured in the funnel **13** if the length thereof, measured along its longitudinal axis is in the range of from 44 inches to 60 inches and the taper of the inner walls **17** is in the range of from 50° to 70° with reference to the longitudinal axis of the funnel **13**, and the diameter of the cylindrical open end **16** thereof is in the range of from 21 inches to 25 inches.

The funnel **13** is positioned adjacent to the window opening **12** with its cylindrical open end **16** distant therefrom, and it is secured to the inner wall of the drill tower **11** by the turnbuckles **18**.

The numeral **21** designates a reservoir having an open end **22** and a closed end **23** with a small opening **24** extending through said closed end **23**. The reservoir is curved so as the longitudinal axis extending through the open end **22** thereof is in the range of 100° to 130° with relation to the longitudinal axis extending through the closed end **23**.

The numeral **26** indicates a screen positioned transversely to the longitudinal axis extending through the closed end **23** of the reservoir **21**. The screen **26** is secured to the inner walls of the reservoir **21** at a point intermediate the bent portion of the reservoir **21** and its closed end **23**. I have found that the screen eliminates turbulence of water rushing into the reservoir **21**, thereby increasing its emptying characteristics.

The numeral **27** indicates handles on the outer wall of the reservoir **21** to be used in moving or adjusting the reservoir **21**.

The open end **22** of the reservoir **21** is connected at an angle to the cylindrical open end **16** of the funnel **13** so as to provide a water tight union which is maintained by the turnbuckles **19**. This connection is made so as water emptying out of the reservoir **21** through the opening **24** in the closed end **23** thereof will be most aided by the force of gravity.

I have found that if the capacity of the reservoir **21** is in the range of from 65 to 75 gallons, water entering the reservoir **21** at the rate of 600 gallons per minute will empty through a 4 inch opening in the closed end **23** thereof without washing back into the funnel **13**.

The numeral **29** indicates a pipe which is connected to the reservoir **21** at the opening **24** in the closed end **23** thereof.

The numeral **28** indicates a horseshoe shaped stand which is positioned around the pipe **29** so as to support the reservoir **21**.

Numeral **45** shows a hose leading from the pressure side of the pumping device **33**.

In FIGURE 3, showing an alternative means for transmitting water emptying out of the reservoir, the numeral **34** indicates a hard suction hose connected at one end to the closed end of **23** of the reservoir **21**, its opposite end being connected directly to the suction side of the pumping device **33**.

FIGURE 4 shows an alternate embodiment of the funnel **13** and the reservoir **21**. The numeral **35** indicates the funnel and numeral **43** shows the reservoir which is integral with the funnel **35**, the two being interconnected by the open area **42**. The funnel **35** and the reservoir

43 are separated by the lower wall 41 of the funnel 35. One end of the lower wall 41, which is indicated by the numeral 46, projects at an angle into the open area 42. The opposite end of the lower wall 41 intersects the reservoir wall 40 at an angle. Numeral 38 is a flange extending from the point of intersection of the lower wall 41 and the reservoir wall 40 into the funnel opening 14.

The numeral 30 indicates a screen disposed between the lower wall 41 of the funnel 35 and the floor 48 of the reservoir 48, thus forming a compartment 47 with respect to the reservoir in the area below the lower wall 41.

The numeral 29 indicates the main pipe leading from the reservoir 43 at a point within the compartment 47. The pipe 29 enters the standpipe 20 at a point lower than that shown in FIG. 4.

The numeral 36 represents an opening in the wall of the reservoir 43 adjacent to the top of the reservoir 43. Numeral 49 is an overflow pipe interconnecting the upper area of the reservoir 43 through the opening 36 and the standpipe 20 at a point lower than that shown in FIG. 4.

The numeral 37 shows a second pipe interconnecting the area inside the flange 38 and the standpipe 20 at a point lower than that shown.

In operation, water is pumped from the pumping device 33 through the hose 45 into the window 12 of the drill tower 11: the water sprayed into the window 11 is deflected by the funnel 13 through the cylindrical open end 16 thereof and into the reservoir 21 where by the force of gravity and water pressure, the water flows through the opening 24 in the closed end of the reservoir 21 into the standpipe 29 from where it flows into the sump 31 from where it is sucked into the pumping device 33 and again made to repeat the cycle. As pointed out above, the water can be made to by-pass the sump 31 by use of the hose 34 connecting the reservoir 21 and the pumping device 33.

In operation of the alternative structure shown in FIG. 4, water is pumped into the funnel 35 and is captured in the reservoir 43 from where it flows by gravity through the pipe 29 to the standpipe 20. As the water enters the compartment 47, turbulence thereof is substantially reduced by the screen 39. The overflow pipe 49 serves to prevent water filling in the reservoir from flowing back through the funnel 35 to the outside. The flange 38 prevents water from washing down the lower wall to the outside, such water is captured and conveyed by gravity to the standpipe 20 by the pipe 37.

Having thus described my invention, I claim:

1. A fire training apparatus which comprises: a structure having an opening therein; a receptacle having an opening therein through one side thereof adjacent its top, said top being sloped in a declining angle away from said side with the opening therein, said receptacle being connected to the internal wall of said structure so that said structure opening and said receptacle opening are in alignment; a baffle extending internally in said receptacle at an inclining angle from the base of said receptacle opening; a

flange fastened at the base of said receptacle opening and protruding into said receptacle opening; an opening through said baffle at a point adjacent said flange; water pumping means; water conduit means interconnecting the base of said receptacle and said water pumping means, said water conduit means entering the base of said receptacle at a point below said baffle; a second water conduit means interconnecting the base of said receptacle and the first water conduit means, said second water conduit means entering the base of said receptacle at a point distant from the area below said baffle; a screen fastened in said receptacle so as to extend between the innermost edge of said baffle and the base of said receptacle; a hose extending from said water pumping means capable of directing water into the said structure opening.

2. A fire training apparatus which comprises: a structure having an opening therein; a funnel connected to the internal wall of said structure, one open end of said funnel being aligned with said structure opening; a reservoir having an open and a closed end being interconnected with the interior of said funnel through the open end of said reservoir; an opening extending through the closed end of said reservoir; screening means traversing the interior of said reservoir at a point distant from its said closed end; water pumping means; water conduit means aligned with said opening in the closed end of said reservoir and interconnecting said reservoir with said water pumping means; a hose extending from said water pumping means capable of directing water into the said structure opening.

3. A fire training apparatus which comprises: a structure having an opening therein; a funnel connected to the internal wall of said structure, one open end of said funnel being aligned with said structure opening; an elongated curved reservoir having an open end and a closed end with an opening extending through said closed end, the open end of said reservoir being connected to the reduced open end of said funnel so that the closed end of said reservoir, is positioned at a point below the open end thereof, said reservoir being curved so that the intersecting angle between the longitudinal axis extending through the open end thereof and the longitudinal axis extending through the closed end thereof is in the range of from 100° to 130°; screening means traversing said reservoir at a point distant from its said closed end; a sump; a standpipe interconnecting said reservoir, through its closed end; with said sump; a hose capable of directing water into said structure opening; pumping means interconnecting said sump and said hose.

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