May 24, 1927. 1,629,490

O. R. ERWIN ET AL

MIXER AND DISTRIBUTOR FIRE EXTINGUISHING APPARATUS

Filed Jan. 9, 1922

Fig. 1,

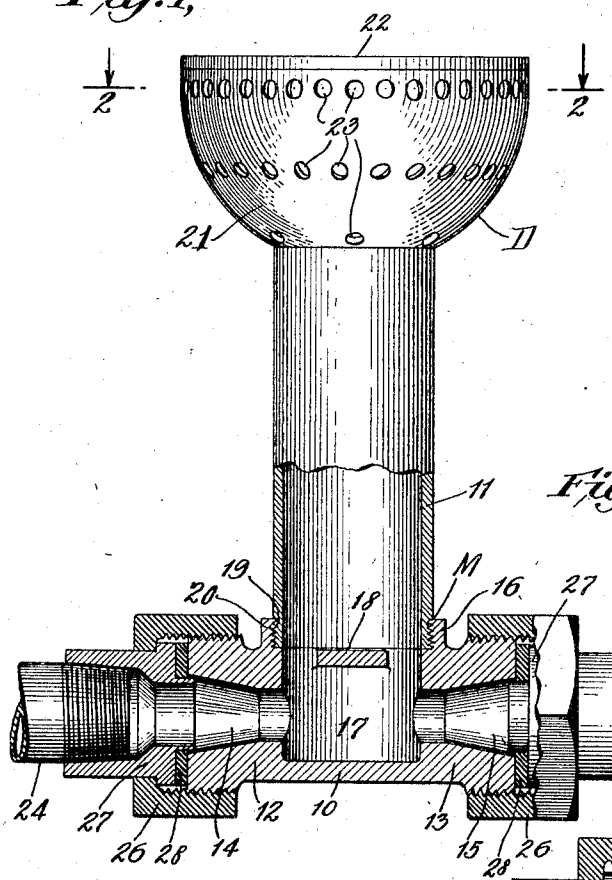


Fig. 3,

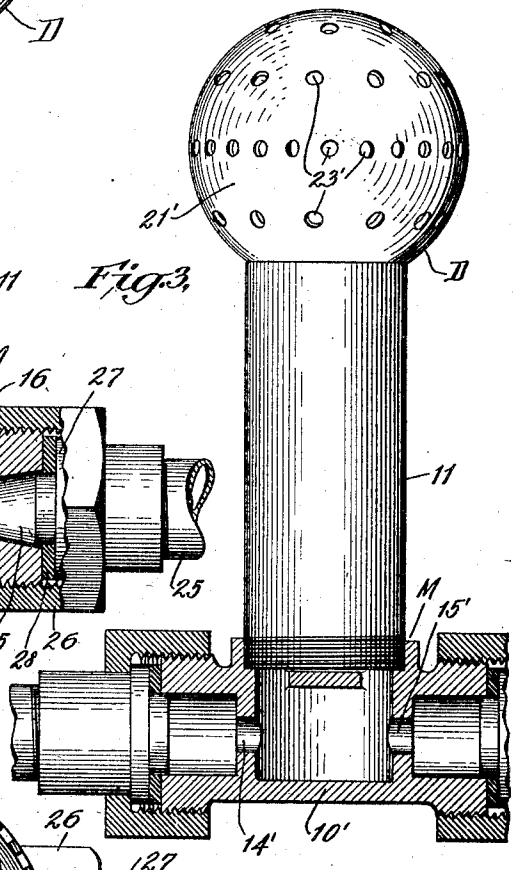
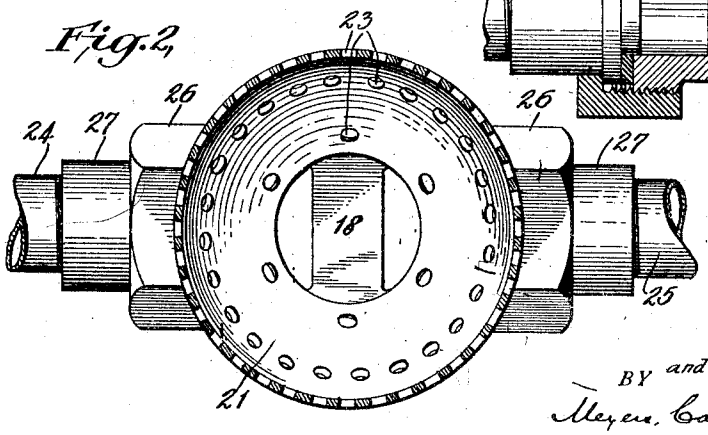


Fig. 2,



INVENTORS
ORLANDO R. ERWIN
and WILLIS D. WITTER
BY Meyer, Cavanagh & Whitehead
ATTORNEYS

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UNITED STATES PATENT OFFICE.

ORLANDO R. ERWIN, OF FOREST HILLS, NEW YORK, AND WILLIS D. WITTER, OF ROSELLE PARK, NEW JERSEY, ASSIGNORS TO FOAMITE-CHILDS CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

MIXER AND DISTRIBUTOR FIRE-EXTINGUISHING APPARATUS.

Application filed January 9, 1922. Serial No. 527,880.

This invention relates to fire extinguishing apparatus, in which normally separated chemical solutions are mixed in time of fire to produce a fire-extinguishing foam and has special reference to the construction and design of the devices for mixing the solutions and distributing the foam over a wide area, being particularly adapted for use in foam systems for the protection of oil fired ships and the like. In such systems a number of foam delivery units, each comprising a foam mixing chamber, is required to be distributively located over the tank top of the ship which represents a considerable top area, having very limited head room or space above it. The function of the units is to cover or coat the entire area substantially uniformly with a blanket of foam in time of fire, and in the interest of economy it is desirable that each unit be effective over an area of large radius. This result has been found to be practically possible of accomplishment, with the production and delivery of foam of good quality, by means of the device herein disclosed and which is in the nature of a pipe fixture and combines, in one structure, a mixing chamber and a delivery chamber the latter having relatively restricted foam projecting outlets.

Figure 1 is an elevation of the preferred form partly in cross-section;

Figure 2 is a cross-section thereof on line 2—2, Figure 1; and

Figure 3 is a modified form.

Referring to Figures 1 and 2 the device comprises generically a mixing means M and a distributing means D.

The former comprises preferably a hollow base part 10 and a chamber or space 11, all constituting the mixing space. The lateral projections 12 and 13 contain the inlet ducts 14 and 15 by which the two solutions enter the mixing space in opposite directions. A baffle 18 is desirable and is formed in one piece with the base. The parts above described are shown as formed of two castings, the part 11 being connected by threads 19 and 20 to the top boss 16. The parts marked 24, 25, 26, 27 and 28 will be recognized as ordinary pipe connections and these members form the entire support for the unit.

The distributing means D, is formed by the integral upper part of the mixing means M and as shown in this figure is a hemispherical chamber 21 provided with a flat top wall 22, and with a plurality of circumferentially spaced orifices 23. In this particular form these orifices 23 are arranged in spaced horizontal circular rows or planes, three rows being here shown. With this arrangement a plurality of radial streams of intermixing solutions is provided, the range of the streams being different in each row of orifices, due to the difference in the directions of their foam jets. By this construction and because the solutions themselves are ejected from the distributing unit while yet in process of mixing, a very satisfactory foam is projected from the holes even though the latter are quite small. The holes or outlets 23, it will be observed, are relatively restricted with reference to the mixing space, so that a considerable velocity of foam jets is obtained, causing the device to cover a large area. A wide radius of distribution is secured not alone because of the restriction of the jet orifices but also by the fact that the jets contain liquid as well as foam when they emerge from the orifices, thus giving them greater weight anad hence greater range. The length of the device as a whole is so short that complete mixture or interaction of the two solutions cannot occur therein, which fact results in the presence of liquid in the jets squirted by the device. The flat top of the distributor permits it to be installed under and close to the deck or flooring above the oil tanks, so that the foam-projecting holes will be as high has possible in the shallow spaces in which these devices are intended to work, and will thus have a maximum range of foam distribution.

Referring now to Figure 3, the mixing head 10′ is substantially the same as the mixing head 10 with the exception that in lieu of providing the tapered inlets or ducts 14 and 15, as in Fig. 1, we provide the reduced inlet orifices 14′ and 15′. The distributing means D in this form of our invention comprises a globe or spherical distributing head 21′ with the plurality of sets of orifices 23′, the action otherwise being the same as in Fig. 1.

It will be obvious that various changes and modifications may be made in the structure disclosed without departure from the

spirit of the invention, defined in the following claim:

A distributor fitting for foam-type fire extinguishing systems adapted for uniformly distributing foam in places having limited headroom, comprising a closed chamber, one end of said chamber constituting a distributing space and being provided with a plurality of individual, distributively-spaced jet orifices, said orifices being relatively restricted with reference to the flow capacity of said chamber and adapted to produce individual horizontal jets, the opposite end of said chamber being provided with two solution-pipe connection means constituting the support of said structure, and the length of said chamber being short enough to insure some solution liquid, as distinguished from foam, being delivered through said orifices, whereby the jets are squirted to a distance many times the length of said chamber.

Signed at New York city, in the county of New York and State of New York this 7th day of January, A. D. 1922.

ORLANDO R. ERWIN.
WILLIS D. WITTER.