

July 15, 1952

H. E. BEDFORD ET AL

2,603,469

FIRE EXTINGUISHING APPARATUS

Original Filed Nov. 20, 1946

FIG. 1.

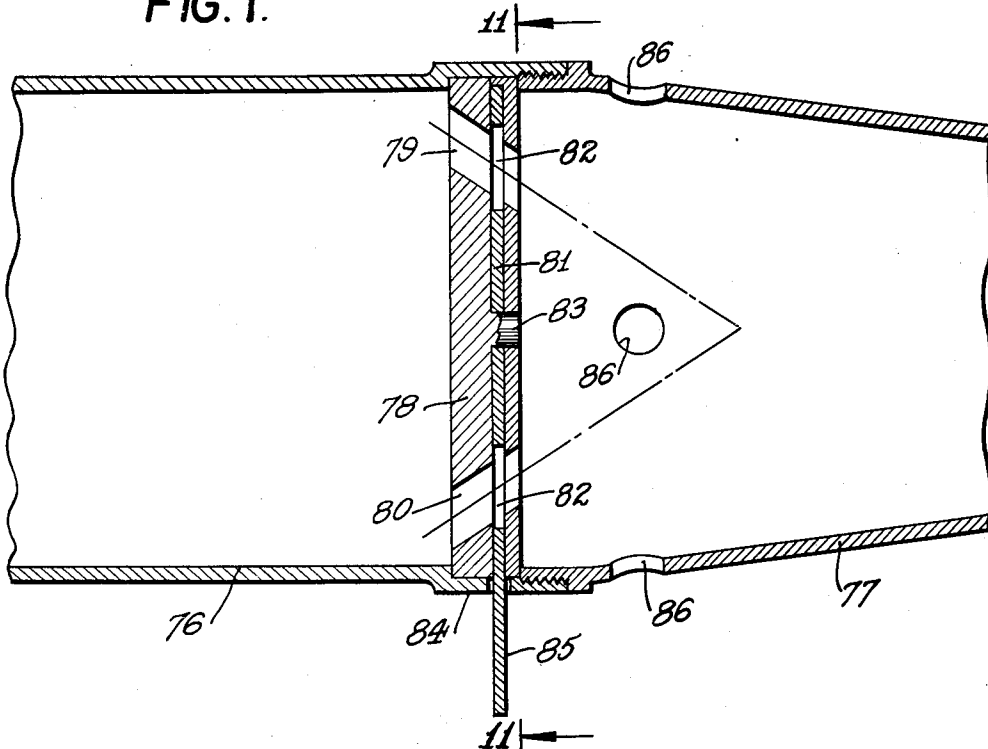
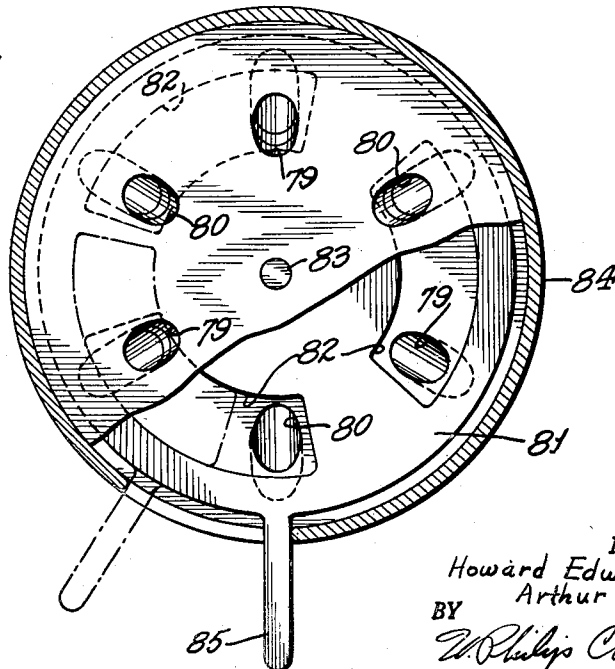


FIG. 2.



INVENTORS
Howard Edwin Bedford
Arthur Hall
BY
W. Phillips Churchill
ATTORNEY

UNITED STATES PATENT OFFICE

2,603,469

FIRE EXTINGUISHING APPARATUS

Howard Edwin Bedford and Arthur Hall, Brentford, England, assignors to Pyrene Manufacturing Company, Newark, N. J., a corporation of Delaware

Original application November 20, 1946, Serial No. 711,170, now Patent No. 2,532,986, dated December 5, 1950. Divided and this application November 23, 1948, Serial No. 61,668. In Great Britain November 7, 1945

1 Claim. (Cl. 261—116)

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This invention relates to fire extinguishing apparatus, and more particularly to apparatus that can be changed or adjusted quickly to deliver either fire extinguishing foam or a simple stream of fire extinguishing liquid such as water.

The production of what is commonly known as air foam or mechanical foam is now well understood in the fire extinguishing field, and such foam is used extensively for putting out fires, particularly those involving inflammable liquids such as oil, gasoline, and the like. The apparatus used for producing this air foam usually consists of a device in which water under pressure and carrying a foam stabilizing compound is projected in one or more jets into one or more receivers in such a manner as to entrain or aspirate air into the stream by ejector action. The turbulent mixture of air, water and foam stabilizing agent thus formed becomes foam by the time it reaches the end of the hose or pipe used for directing it on the fire.

In many instances it is desirable to apply foam to one portion of a fire, and when this portion is under control to deal with other portions of the fire by means of an ordinary stream of water. In most forms of foam producing apparatus, the velocity at which the foam is delivered, or the throw of the foam, is considerably restricted by reason of the fact that some of the energy of the original stream of water under pressure is used up in producing the foam. Consequently, if the supply of air in such an apparatus were merely cut off, the stream of water thus obtained from the apparatus would not have much force because the pressure of the initial stream of water would not be utilized to best advantage. Also, the stream would be smaller in size than would be desirable.

One object of this invention is to provide apparatus which can be quickly changed from an apparatus for producing and delivering fire extinguishing foam to an apparatus for delivering a substantially full size stream of water.

Another object of the invention is to provide foam making apparatus of this type in which the means for producing the aspirating jets of liquid can be moved to allow greater flow of the liquid.

Other objects and advantages of our invention will be explained and will be apparent from the following description of an embodiment of the apparatus illustrated in the accompanying drawings, in which

Fig. 1 is a fragmentary longitudinal sectional view through the center of apparatus illustrating an embodiment of our invention.

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Fig. 2 is a vertical sectional view taken on the line II—II of Fig. 1.

In the embodiment of our invention illustrated in Figs. 1 and 2, which embodiment is suitable for apparatus of the kind held by hand in use, liquid under pressure is delivered through a hose pipe and connection (not shown) to a tubular part 76 which is connected to a tapering part 77 terminating in a nozzle (not shown). A suitable foam stabilizer may be premixed with the water delivered to the tubular part 76, injected into this water stream, or introduced in any other suitable manner as will be understood by those skilled in the art. A two-part orifice plate 78 is fixed in the part 76 and formed with six orifices, three of which, 79, are used when foam is being formed and the other three of which, 80, are used only when water is being delivered. All these orifices are inclined to the axis so that the jets emerging from them meet about a point on the axis of the tapering part 77 to cause the liquid to whirl as it passes onwards through the part 77. A disc 81, formed with three arcuate slots 82, is rotatably carried between the two parts of the orifice plate 78 by a short spindle 83 fixed to one of the parts, the orifice plate 78 and the disc 81 being held axially by a securing ring 84. The disc 81 can be rocked about the spindle 83 by a handle 85. Each of the slots 82 is always in register with one of the orifices 79, but when foam is to be formed the orifices 80 are closed by the body of the disc 81. When water is to be delivered, the disc 81 is turned to bring each slot 82 into register also with one of the orifices 80, so that water passes through all six orifices, that is to say, the cross-sectional area open to the passage of liquid is doubled. In this embodiment, air is drawn in through openings 86 in the wall of the tapering part 77, which part 77 is made of such diameter that it will accommodate either the volume of liquid and air when foam is being formed or the increased volume of liquid when water is being delivered. By reason of the increase in volume of the water, there is little space available in the part 77 for air and so there is very little tendency for air to be drawn in by the water passing through all six orifices in the orifice plate 78.

In accordance with our invention, the apparatus may of course be used in its normal manner to make foam and can also be quickly converted to deliver a flowing stream of water without sacrificing a large portion of the water pressure and volume available at the inlet of the apparatus. The moving of the orifice plate and the provision of extra space around the receiver for the water to flow make this possible. It will be

apparent, of course, that when the apparatus is used to deliver a stream of water, the various joints must be tight to prevent loss of water.

The terms and expressions which we have employed are used as terms of description and not of limitation, and we have no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof, but recognize that various modifications are possible within the scope of the invention claimed.

This application is a division of our parent application Serial No. 711,170 filed November 20, 1946, now Patent No. 2,532,986 of December 5, 1950.

We claim:

Fire extinguishing apparatus for producing foam or a stream of liquid comprising a tubular receiver tapered toward its outlet end and having openings near its entrance end for admitting aspirated air under atmospheric pressure, a conduit joined to said entrance end for supplying fire extinguishing liquid under pressure, a series of ports between said conduit and receiver for directing converging streams of liquid into said receiver, a valve for controlling liquid flow through said ports, means for actuating said

valve to one position for opening all of said ports, and into a second position for closing only certain of said ports, the proportions of said ports, receiver and openings being such as to aspirate air through said openings to produce foam in said receiver when certain only of said ports are open, and to increase the flow of liquid to substantially fill said receiver when all of said ports are open to thereby lessen the aspirating effect to such an extent as to produce a stream of liquid.

HOWARD EDWIN BEDFORD.
ARTHUR HALL.

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