Oct. 15, 1940. S. E. ALLEN 2,218,189

ANTIRECOIL DEVICE

Original Filed Dec. 30, 1936

Fig. 1.

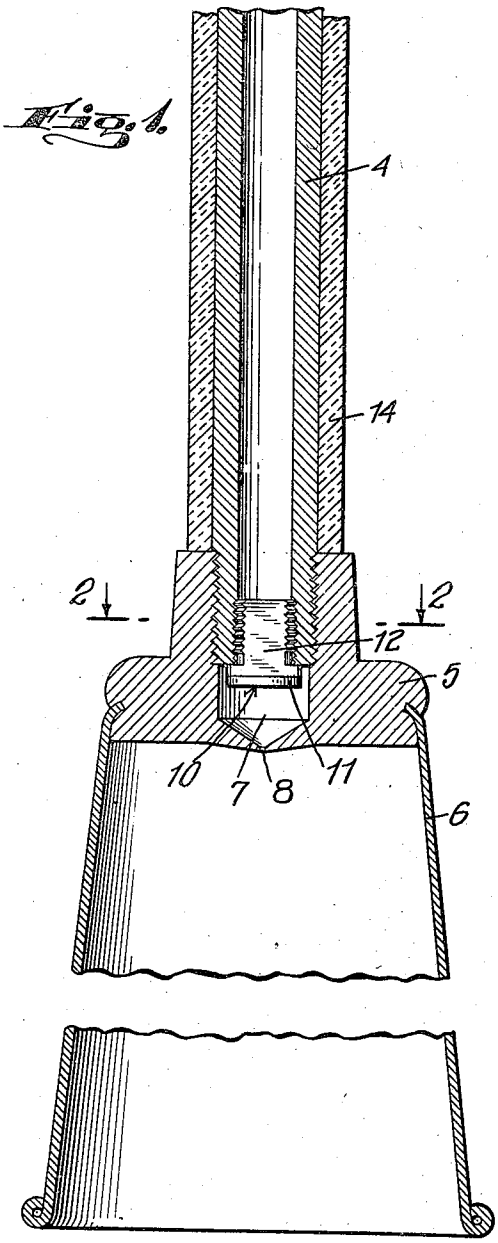


Fig. 2.

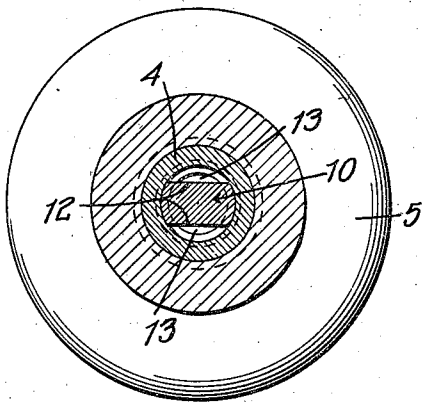
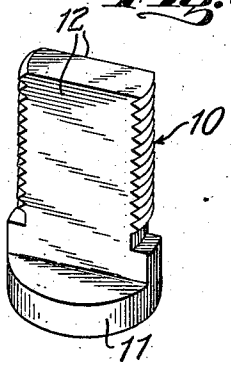


Fig. 3.



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ANTIRECOIL DEVICE

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Original application December 30, 1936, Serial No. 118,207. Divided and this application July 13, 1938, Serial No. 218,909

3 Claims. (Cl. 169—11)

The present invention relates to fire extinguishers employing a high pressure extinguishing fluid and more especially to antirecoil means, disclosed in my co-pending application Ser. No. 118,207, filed December 30, 1936 of which this application is a division.

My invention relates particularly to portable extinguishers, although it is not limited thereto. It is common practice to provide cylinders containing high pressure extinguishing fluid, such, for example, as liquid carbon dioxide, in sizes which may be conveniently carried by hand to the scene of the fire, the cylinders being provided with discharge pipes that are adjustable to direct the extinguishing medium where desired. It is also common practice to provide the discharge pipe with a discharge horn adapted to prevent entrainment of air in the discharging fluid and also, in the case of carbon dioxide, to transform the fluid into "snow" or solidified particles of carbon dioxide.

Owing to the high pressure of liquefied carbon dioxide the discharge of the fluid develops a recoil powerful enough to throw the cylinder violently about and do considerable damage, unless the cylinder is securely held. For this reason, it is requisite that the discharge pipe be provided with suitable antirecoil means, such, for instance, as a nozzle forming a plurality of jets which are so disposed that they will react against one another.

It will be understood that the strength of the recoil depends upon the area of the discharge orifice. The horn is provided with a relatively small orifice through which the highly compressed fluid enters the horn where it expands enormously. The recoil is relatively small as long as the horn is attached because of the minute size of the orifice. Hence, an operator may readily control the horn and direct the discharge at will. In order to prevent material expansion of the fluid in the space between the end of the discharge pipe and the horn orifice, which expansion might result in sufficient chilling to freeze up the orifice, it is desirable to provide relatively large ports at the end of the pipe permitting the fluid to reach the horn orifice in a comparatively warm state. With ports of this size an antirecoil balance is necessary when the horn is detached.

It is an object of my invention to provide means at the discharge end of the pipe for connecting a discharge horn thereto and, further, to provide the discharge end of the pipe with antirecoil means which will give a balanced discharge of the fluid when the horn is disconnected from the pipe.

A further object of my invention is to provide a very simple antirecoil device of this character which will not project diametrically from the pipe and hence will not interfere with the coupling of a horn over the device upon the end of the discharge pipe.

Other objects of my invention will appear in the following description of a preferred embodiment and thereafter the novelty and scope of the invention will be pointed out in the claims.

In the accompanying drawing:

Figure 1 is a diametral longitudinal section through a discharge pipe and nozzle embodying my invention;

Fig. 2 is a view in section on line 2—2 of Fig. 1, showing details of my improved anti-recoil device; and

Fig. 3 is a perspective view of my improved antirecoil device.

In Fig. 1, I show the end of a discharge pipe 4 which as disclosed in the application referred to may be swivelly connected to a portable container so that it will normally lie substantially parallel thereto. The free end of the pipe 4 is externally threaded to receive the head 5 of a horn 6. This head 5 is formed with a chamber 7 having an orifice 8 in the outer end wall thereof, through which fluid may discharge into the horn 6. An antirecoil device is provided at the outer end of the pipe 4 which consists of a plug 10 threaded into the pipe and provided with a head 11. This plug is flattened at opposite sides, as indicated at 12, providing passages 13 through which the fluid may escape. However, the head 11 causes the fluid escaping from the passages 13 to be diverted laterally in opposite directions, thereby balancing the recoil of the discharge on one side against that on the other. It will be understood that the flattening of the body of the plug is carried part way into the head as well leaving an overlying lip spaced from the end of the pipe 4 at the outer end of each discharge passage when the plug is screwed home into the end of the pipe. The head 11 is of smaller diameter than the chamber 7, so that when the horn is applied to the end of the pipe 4, it will not interfere with the passage of fluid out of the pipe. The size of the passages 13 is such that the fluid will reach the orifice 8 with insufficient expansion to cause excessive chilling, thereby keeping the head 5 relatively warm and preventing the orifice from being choked up with solidified carbon dioxide. Since there will be some expansion of the fluid in

its passage through the pipe 4 and to the orifice 8, I prefer to provide the pipe 4 with a covering 14 of heat insulation material.

I have described my invention as applicable to the discharge of carbon dioxide, but it will be understood that the antirecoil device may also be employed with other fluids and discharge ports or conduits in other connections and relations, such as disclosed in Letters Patent of the United States No. 2,078,553 granted April 27, 1937 and No. 2,059,189 granted October 9, 1934. Hence I wish it to be understood that my invention is not limited to the particular application shown and that I reserve the right to make various changes without departing from the spirit and scope of my invention as set forth in the claims.

I claim:

1. The combination with a discharge conduit for fluid under pressure, of a screw plug threaded into said conduit and flattened lengthwise at diametrically opposite sides thereof to form a pair of discharge passages between the wall of said conduit and said plug, said plug being formed with a head having stops to limit the extent to which the plug may be screwed into said conduit and said head being partly cut away outwardly of said stops to form a lip opposite each passage adapted to cause lateral deflection of the fluid discharging from the passages.

2. An antirecoil device for a discharge conduit consisting of a plug adapted to be screwed into said conduit, said plug having a threaded body and an enlarged head defining laterally extending stops, said plug being formed with flattened areas at diametrically opposite sides thereof and extending throughout the length of the body and part way through the head outwardly of said stops, leaving oppositely disposed lips on the head of materially smaller thickness than the body of the head between said flattened areas.

3. The combination with a discharge conduit for fluid under pressure, said conduit being threaded exteriorly and interiorly, of a screw plug threaded into said conduit and interrupted circumferentially at equidistant points to provide a plurality of discharge passages for fluid between the wall of the said conduit and said plug, and lips on said plug disposed opposite said passages respectively and spaced from the end of said conduit and located within the projected circumference of the exteriorly threaded portion of said conduit and a fluid discharge continuing head and horn member connected by said exterior threads to said discharge conduit while said plug is in position in said conduit.

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