May 16, 1933. H. C. LAENGEL 1,909,837

AUTOMATIC FIRE EXTINGUISHER

Filed April 23, 1931

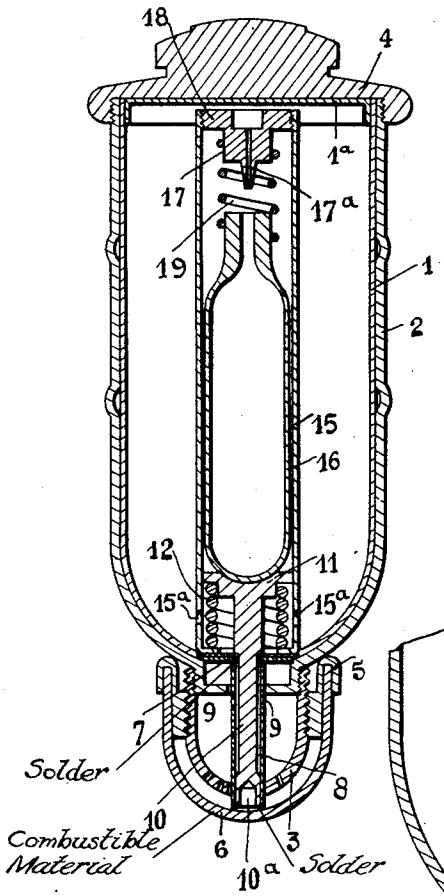


Fig. 1

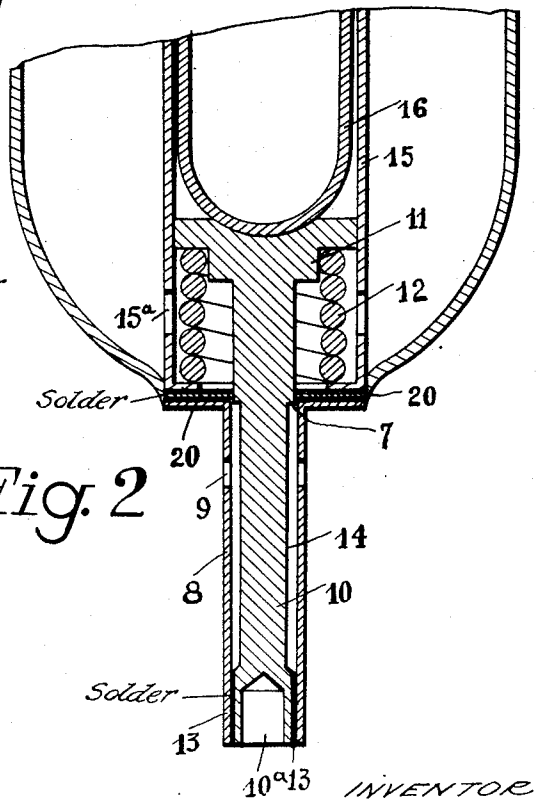


Fig. 2

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Patented May 16, 1933

1,909,837

UNITED STATES PATENT OFFICE

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AUTOMATIC FIRE EXTINGUISHER

Application filed April 23, 1931, Serial No. 532,345, and in France August 18, 1930.

The present invention relates to fire extinguishers in which the vessel containing the extinguishing liquid also contains the recipient filled with compressed gas, the gas being released in order to expel the liquid when the said recipient is pierced after the burning or melting of a retaining member. The chief drawback in the use of such apparatus consists in the difficulty which is found in providing at the same time for an effective functioning and for an absolutely leakless construction of the vessel containing the liquid, as the arrangement of the releasing mechanism requires the use of packed joints or valves in which non-leaking conditions are difficult to obtain. In fact, leakage is of frequent occurrence, and such apparatus are found to be partially or entirely empty when their functioning becomes necessary.

The present invention relates to an automatic extinguisher of this class, which however comprises a vessel without joints, said vessel being thus quite leakless; its releasing mechanism is remarkably simple and has no pivoting parts which might get out of order or become jammed in place.

The said apparatus is characterized by the fact that it comprises, in combination, a vessel for liquid having a leakless end portion, a tube pierced with lateral apertures, mounted below the outlet of the said vessel, a driving member urged by a spring which serves to drive a recipient filled with compressed gas against a striker, the rod of said member being engaged in the said tube while its spring is held in the compressed position by the member itself whose rod is soldered with a readily fusible solder to the end of the discharge tube; a washer is traversed by the rod of said driving member, and it is soldered at its periphery to the lower end of said vessel, it being also soldered to said rod on the inner edge of its aperture, thus preventing all contact between the liquid and the fusible solder employed upon the rod. By the action of a flame or of a sufficient rise of temperature, the rod of the driving member will be released by the melting of the solder. Due to the sudden expansion of the spring, the solder joining the rod to the inner edge of the washer will be broken thus allowing the liquid to escape, while at the same time the gas recipient is driven against the striker.

Further particularities and advantages of the invention will be specified in the following description with reference to the accompanying drawing which is given by way of example.

Fig. 1 shows a fire extinguisher which is chiefly adapted for the carburetors of internal combustion engines, in axial section.

Fig. 2 shows the lower part of the apparatus on a larger scale, also in axial section.

The said apparatus comprises a vessel for the liquid, having preferably the form of military projectile, whose upper end 1*a* is secured in a leakless manner by soldering, crimping or like means. As specified in French Patent No. 628,720 of December 24th 1926, said vessel is contained in an outer casing 2 having at one end a sprayer 3 and closed at the other end by a screw plug 4. Upon the said sprayer is mounted a cap 6 of combustible material, by means of a tapped ring 5.

In conformity to the invention, a tube 8 is connected with the outlet 7 of the vessel 1, said tube being pierced with lateral apertures 9 for the discharge of the liquid under pressure. In said tube is the rod 10 of a driving member 11 which is urged by a compression spring 12. In order to maintain the said spring in the compressed position, the rod 10 is held by fusible solder at 13 to the end of the tube 8. Between the soldered joint 13 and the outlet 7 of the vessel, the rod 10 has a reduced diameter, thus providing an annular space 14 between the tube and rod in order to prevent the melted solder from spreading, by capillary action, upon an excessive length during the construction of the apparatus. At the lower end of the rod is a recess 10*a* providing for a more rapid transmission of the heat to the solder 13.

In the vessel 1 is a tube 15 which leads from the outlet 7 to a point within a short distance from the upper end 1*a* of the vessel; this tube is pierced at the bottom with apertures 15*a* for the circulation of liquid, and it serves a double purpose. On the one hand it serves to contain the driving member 11

and its spring 12, also the gas recipient 16 and the striker 17, and on the other hand it leads the gas escaping from the pierced recipient to a point above the level of the liquid. For this purpose the striker 17, which is secured to a disk 18 mounted in the tube 15, is pierced with a channel 17*a* for the discharge of gas. A weak reaction spring 19 urges the recipient 16 out of contact with the said striker.

A washer 20 forms a leakless partition between the liquid and the discharge tube 8; for this purpose, the washer is soldered at its outer periphery between the tube 15 and the bottom of the vessel, and at its center to the rod 10 which passes through it and which has its larger diameter at this point; said washer 20 thus prevents all contact between the liquid and the soldered point 13.

The operation of the said apparatus is as follows.

When a flame is produced near the lower part of the apparatus, the combustible cap 6 takes fire, and the fusible solder 13 melts: the driving member 11 is thus released and it is at once pushed forward by the spring 12 and drives the end of the recipient against the striker 17.

At the same time, the sudden motion of the rod 10 loosens the solder which connected the said rod with the washer 20. The rod which is thus raised will now have its portion of small diameter positioned in the central hole of the washer, thus offering passage to the liquid. The gas which is given off at the top of the tube 15 and above the level of the extinguishing liquid, will expel the liquid under pressure through the orifice 7, the tube 8 and the apertures 9, whence it is expelled through the small perforations of the sprayer 3. It is obvious that the apparatus will also operate even without direct contact with the flame, if the surrounding temperature is sufficiently high to melt the cap 6 and the solder 13.

As observed by what precedes, in addition to its very simple operation, the said apparatus has the advantage of the use of a vessel for the liquid which is quite leakless due to the fact that it is entirely free from packed joints, as it is hermetically closed at the top by its end 1*a* and at the bottom by the soldered washer 20. In this manner there will be no loss of liquid, and the apparatus is in condition to operate in a reliable manner for a great length of time.

Obviously, the invention is not limited to the form of construction herein described and represented, and it is susceptible of all desired modifications in the form and proportions of the vessel, and in the releasing mechanism.

I claim:

A fire extinguisher comprising a liquid containing vessel having an outlet at one end thereof, a tubular member connected to said outlet, a tube portion centrally supported in said vessel and communicating with said outlet, said tube portion having openings in the side wall thereof to serve as a passage for the liquid, a striker formed with an outlet channel fixed to the end of said tube remote from the outlet of the vessel, a gas container movably carried in said tube portion, a driving member bearing against the container, said driving member having a reduced rod portion extending into the tubular member, means for actuating said driving member to force the container onto the striker, a washer between the tube portion and the vessel and engaging the rod portion at the outlet of the vessel to seal the outlet, fusible means securing the rod portion of the driving member to the tubular member, and a combustible cap carried by the vessel for melting said fusible means and releasing the driving member under high temperatures.

In testimony whereof I affix my signature.

HENRI CHARLES LAENGEL.