

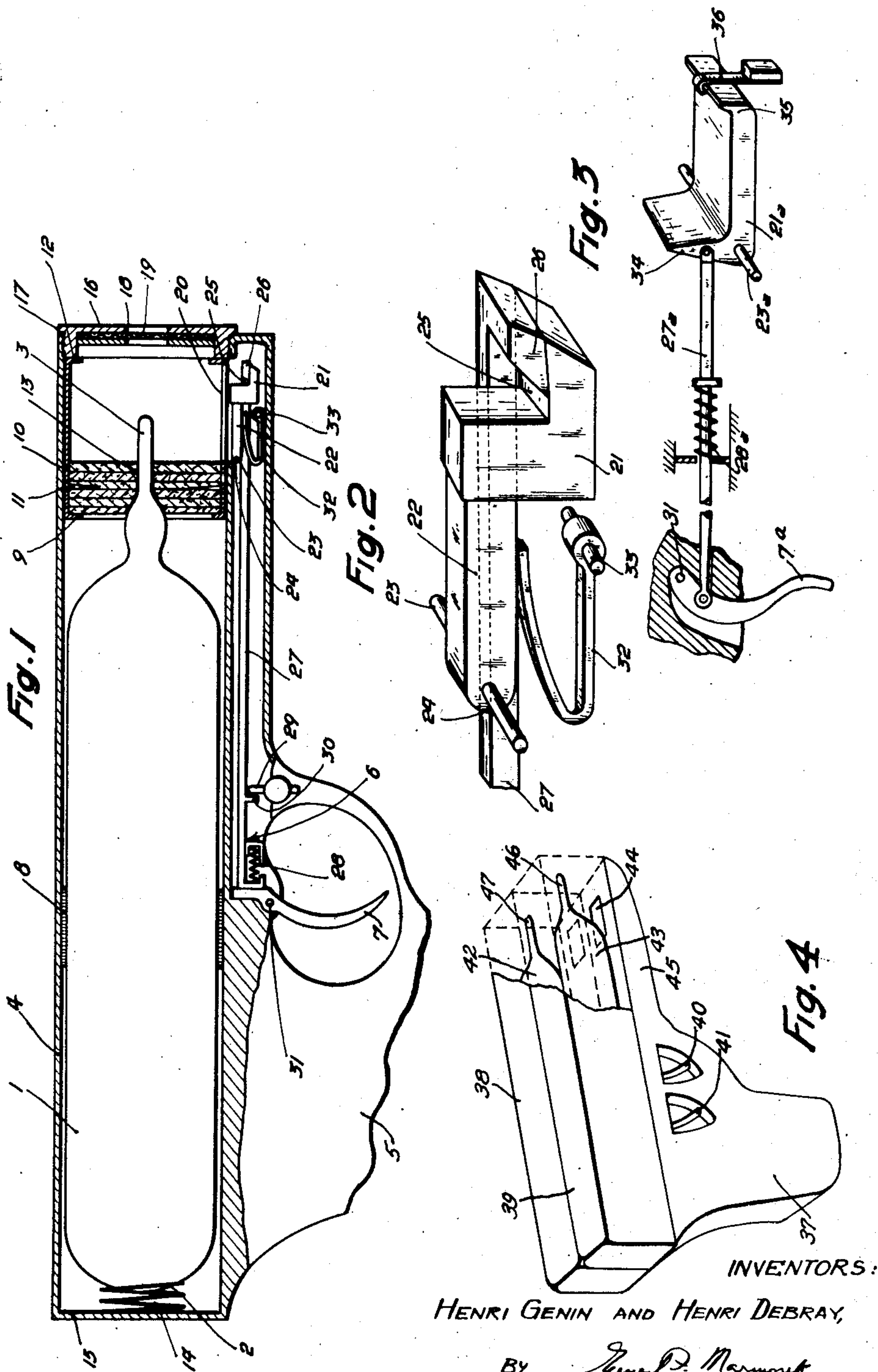
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TRIGGER FIRE EXTINGUISHING APPARATUS

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## UNITED STATES PATENT OFFICE

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TRIGGER FIRE EXTINGUISHING  
APPARATUS

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This invention relates to a fire extinguisher of the type comprising a glass ampoule filled with a volatile extinguishing liquid such as methyl bromide, designed and intended particularly for use on motocars or aircrafts and more generally wherever it is desirable or necessary that the user be able to operate the same with one hand.

Among other things the invention provides a fire extinguisher of said type in which the liquid may be ejected from the ampoule by actuating a trigger mechanism which controls a device to break the capillary end of the ampoule.

The above and other objects of the invention will be made to appear more clearly from the following detailed description in which reference is made to the accompanying drawings in which:

Fig. 1 is a side elevational view partly in section of an apparatus according to our invention;

Fig. 2 is a perspective view on a larger scale of the parts included inside the circle II of Fig. 1.

Fig. 3 is a modification of the actuating mechanism for the block of Fig. 1.

Fig. 4 is a perspective view of an apparatus according to our invention with two ampoules.

In the embodiment shown in Figs. 1 and 2, the extinguishing liquid, methyl bromide for instance, is held in a glass ampoule 1 in the shape of a tube of about 30 mm. diameter, with a content of 100 cc., with one end 2 of the tube 1 rounded off, the other end being closed by a capillary tube 3 of diameter less than 1 mm. This capillary tube 3 is from 2 cm. to 2.5 cm. in length and enables the extinguisher liquid to expand in the form of a directed spray.

The ampoule 1 is housed in the barrel 4 of a kind of revolver provided with a grip 5 and a trigger pull-off mechanism 6.

The barrel 4 of this revolver has a slightly larger diameter than the ampoule 1 so as to give the ampoule a slight slope in regard to the axis of the barrel.

The ampoule 1 is held tightly in the middle by a felt collar 8 glued for instance to the inside of the barrel 4.

The capillary tube 3 of the ampoule is held by a hard cork collar 9 fastened inside a thin ring 10 by six pointed parts 11 housed in six holes of the ring 10.

This ring 10 slides easily in the tube 4 of the revolver and is ended off in front by a raised edge 12 that enables the fingers to get hold of it and take it out by drawing the cork collar 9. The collar 9 has a cone-shaped opening 13 in the centre; the larger base of the cone is at the rear to enable the capillary tube 3 to be inserted easily and to be held tighter at 13 on the side of the smaller base of the cone.

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The ampoule 1 of which the length may vary slightly is kept pushed forward, towards the collar 9, by a flexible spring 14 that acts between the bottom end 15 of the barrel 4 and the end 2 of the ampoule and that keeps the ampoule in a fixed position, thus avoiding any possible damage through any bumps. The ring 10 assumes a settled position, by being kept tight against the ampoule 1 by a threaded plug 16 that is screwed in the barrel opening. The outer edge 17 of this plug 16 is milled so that it can be screwed and unscrewed. There is a large aperture in its middle portion 18 provided by a grid 19 that acts as a protection for the tip 3 of the ampoule 1 and through which the liquid spray is broken up partly to be scattered inside the spraying cone.

The revolver is held in the ordinary way by the grip 5 that is placed in the rear part of the apparatus and throws it out of balance, thus helping the liquid to expand through the capillary tube 3. The ampoule as a matter of fact must be sloped downwards so that not only the vapours but also the liquid may be blown out towards the front.

The whole of the pull-off mechanism 6 is housed below the barrel 4 so that the barrel diameter is not reduced thus enabling the ampoule to be inserted through the front end. An aperture 20 is cut in front below the barrel 4 and in the ring 10, to enable the block 21 to move upwards and break off the capillary tube 3 in its middle at 13, through a blow given at its end. This block 21 is carried by a lever 22 pivotally mounted on a spindle 23 and provided with a short rounded off heel 24. It is hollowed in front with a notch 25 where is hooked a finger 26, fixed rigidly with the trigger 7, by means of the arm 27. The trigger 7 and the arm 27 are pushed to the rear by the spring 28 and held in this rear position by a safety catch 29, that works together with a stud 30 of the arm 27. The trigger is hinged at 31. The lever 22 that carries the block 4 is thrust strongly upwards by an expansion spring 32 fastened to the revolver by a spindle 33.

It will be easy to see how the apparatus works from what has gone before:

When the ampoule 1 is placed inside the barrel 4, an extinguishing liquid spray is got by pressing back on the trigger 7, after lowering the checking pin 29 that plays the part of safety catch.

When the trigger 7 is pressed back, it pushes forward the arm 27 and the finger 26. The block 21 is then released and is pushed sharply upwards by the spring 32. It swings round the spindle 23 and gives a hard knock to the tube 1 at its end 3. The tube is broken.

The spring 32 presses on the lever arm 22



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pivoted at 23 and owing to its rounded heel 24 the lever 22 takes up at once a position parallel to the upper arm of the spring 32 so that the block 21 does not remain in front of the liquid spray.

This spray squirts out through the grid 19 that breaks it up partly in the form of fine globules.

It is easy to operate the placing in position of a full ampoule and to replace an empty ampoule in the following way:

The front milled plug 16 is unscrewed and removed, and the safety catch 29 is drawn down.

With the spring 32 assumed to be expanded and the block 21 lifted, the block is first of all lowered to hook it by the catch 25 to the finger 26.

The safety catch 29 is then raised again.

The ring 10 with its hard cork collar 9, bored with a conical shaped hole, is then withdrawn from the barrel 4 and an ampoule full of methyl bromide is inserted in the barrel, with the rounded end 2 going in first; it has the effect of slightly compressing the flexible spring 14.

The ring 10 is put back in position so that the slit 28 is below, opposite the corresponding aperture of the barrel.

If the capillary tube 3 is put slightly out of centre, the larger base will fit with the conical opening and the tube will be brought into the centre of the revolver at 13.

The milled plug 16 is then screwed up.

The ampoule 1 is then well held forward by the spring 14 and the felt 3 prevents it from coming in contact with the metal tube so that there is no danger of any breakage.

In the modified embodiment shown in Fig. 3, the block 21a intended for breaking the end of the capillary tube is a bent lever swinging round a horizontal spindle 23a and of which the end of the small arm 34 is connected by the rod 27a to the trigger 7a.

The block 21a is held lightly at the end of the large lever arm 35 by a small flexible strip 36 with a bent over end.

When the finger presses on the trigger 7 the rod 27a draws on the end of the lever arm 34 and the block 21a is pulled rearward through a counter-motion rod and begins to rotate round its spindle 23a; the slope and curve of the flexible strip 36 are such as to permit the edge of the arm 35 to escape from said strip 36 after a slight rotation of the said arm 35; when the arm 35 gets free from the flexible strip 36 then the block 21a swings sharply round its spindle and its arm 35 strikes the capillary tube that it breaks off at the middle. The block 21a is brought automatically to its original position by the trigger spring 28a.

In the embodiment shown in Fig. 4 the apparatus is in the shape of a revolver 37 provided with two barrels 38, 39, two pull-off mechanisms actuated by two triggers 40, 41. A glass ampoule 42, 43 is housed in each of the barrels 38, 39.

When the triggers 40, 41 are successively pressed back, they release, as in the embodiment shown in Fig. 1, corresponding blocks which move upwards through apertures 44 cut in the body 45 of the apparatus just below the capillary ends 46, 47 of the ampoules 42, 43, and break off said ends successively.

Our invention, of course, is in no way restricted to the details of the embodiments such as shown or disclosed which have been given only as an example. As a special form the apparatus might not be provided with a revolver grip and

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might appear in the shape of a flashlight for instance, and the extinguishing liquid might be placed directly into the barrel protected possibly by a suitable coating, the pull-off mechanism might cause not the breaking of a capillary tube but the puncturing of a closing diaphragm.

What we claim is:

1. In a fire extinguishing apparatus including a tube having an opening at its front end, a glass ampoule containing a volatile fire extinguishing liquid and housed inside said tube, a nozzle-like breakable tubular projection provided on said ampoule pointing at said opening and adapted to be broken to give passage to said liquid, an horizontal spindle provided under said tube, a lever carried by said spindle and adapted to swing around said spindle axis, a block having a notch at its front end carried by said lever and adapted to break said tubular projection, an expansion spring urging said lever towards said projection, a finger adapted to engage said notch for securing said block and said lever against rotation and a detent mechanism fixed with said tube to control said finger.

2. In a fire extinguishing apparatus as in claim 1, further a hand grip fixed below and to the rear part of said tube for providing and easy handling and working of said apparatus by a single hand and a trigger fixed with said hand grip for actuating said detent mechanism.

3. In a fire extinguishing apparatus including a tube having an opening at its front end, a glass ampoule containing a volatile fire extinguishing liquid and housed inside said tube, a nozzle-like breakable tubular projection provided on said ampoule pointing at said opening and adapted to be broken to give passage to said liquid, an horizontal spindle journaled under said tube, a bent lever adapted to swing around said spindle axis and having a small arm and a longer arm, said longer arm being adapted to break said projection, a rod pivotally secured to said small arm for pivoting said lever, a flexible strip adapted to hook said longer arm for securing said lever against rotation and a detent mechanism fixed with said tube to control said rod.

4. In a fire extinguisher, a tubular holder, an elongated glass ampoule containing a volatile fire extinguishing fluid disposed in said holder and including a frontal nozzle-like severable projection for fluid discharge upon projection severance, means connected to said holder and actuable for severing said projection comprising an impact element normally spaced from said projection, means for moving said element to a temporary position of impact with said projection for severance thereof and for subsequent return towards the normal position, and a mechanism including a manually operative trigger pivoted to said holder and connected to said element and being operable for initiating the movement of said element to said temporary position.

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