March 15, 1932. E. J. T. WENNERSTRÖM 1,850,042

BOTTOM IMPACT FUSE FOR ARMOR PLATE PIERCING SHELLS

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Fig. 1.

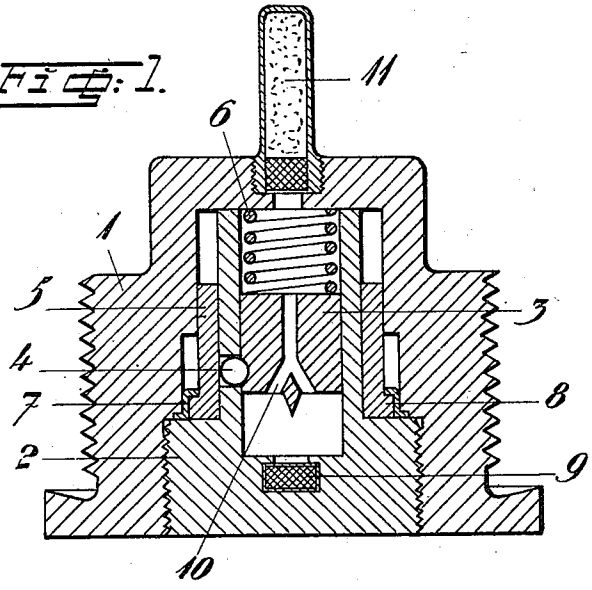
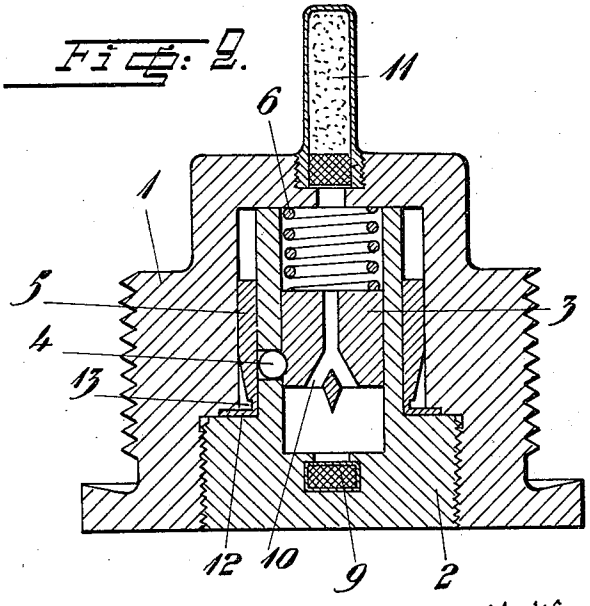


Fig. 2.



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BOTTOM IMPACT FUSE FOR ARMOR-PLATE PIERCING SHELLS

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The present invention relates to bottom impact fuses for armor-plate piercing shells.

In war-vessels it often happens that the plating other than the actual armor-plating consists of a thin plating, arranged outside the armor-plating and at some distance from this plating. When a vessel provided with a plating constructed in this manner is bombarded, the shell is caused to explode on impact with the thin outer plating, whereby no demolition of the real armor-plating occurs. In order to bring about the piercing of the armor-plating as well as the thin outer plating and a consequent demolition of the inner parts of the vessel, the shell must be provided with a fuse, which does not cause the shell to explode on impact at the thin outer plating, but which causes the explosion upon the shell piercing the actual armor-plating. Therefore the fuse must act with a short delay, so that the explosion occurs immediately behind the armor-plate.

According to the present invention this is effected by providing the impact fuse with a locking sleeve or ring for the ignition device, the said sleeve or ring being slidably arranged longitudinally of the fuse and retained in safety position by locking means of such strength as to overcome the force of inertia imparted to the locking sleeve by the impact of the shell with thin plating, whilst by the force of inertia derived from impact with armor-plating, the locking is caused to overcome the locking means and is axially moved, whereby the shell is caused to explode.

In the accompanying drawings two constructional forms of fuse according to the present invention are illustrated.

Figure 1 shows a vertical cross-sectional view of one form of the fuse, and Figure 2, a vertical cross-sectional view of the other fuse.

Referring to the drawings, 1 is the body of the fuse, in which the member 2 is threaded. This member 2 is provided with a cylindrical channel for the needle holder 3, which is influenced by a compressed spring 6 and retained in its safety position by means of one or more balls 4 partially extending into recesses in the needle holder 3 and mounted within openings in the member 2, the ball or balls 4 being prevented from leaving their safety-ensuring positions by means of the locking sleeve 5, slidably arranged in the fuse body 1. The locking sleeve 5 is maintained in a rearward or locking position by locking means comprising in the modification according to Figure 1, a locking ring 7 which may be elastic, the locking ring 7 being provided with flanges at both ends thereof. One flange of the locking ring 7 is adapted to reside in a correspondingly-shaped recess provided in the fuse body 1 and the other flange thereof is adapted to embrace an annular collar 8 formed on the locking sleeve 5. The strength of the locking ring 7 is so adjusted that it overcomes the force of inertia imparted to the locking sleeve 5, if the shell pierces thin plating, that is to say, the locking sleeve 8 is maintained in its locking position below a predetermined value of retardation of the shell.

If, however, the shell pierces armor-plating, whereby the retardation of the shell is raised above the predetermined value, the locking sleeve 5 by force of inertia will break or deform the locking ring 7 and slide to an interior position, thus permitting the ball or balls 4 to leave their locking positions, whereby the needle holder 3 is released and forced backwards against the detonator cap 9 by means of the spring 6 and thus causes a firing of the said cap. The flash arising therefrom is conducted through the channel 10 in the needle holder 3 to the bursting charge 11, which causes the shell to explode.

The second constructional form of fuse shown in Figure 2 is similar to that shown in Figure 1 except for the construction of the locking sleeve 5. In this constructional form the locking sleeve 5 is provided with a flange

12, adapted to bear against the body 1 of the fuse by residing within a corresponding recess provided in the body 1 of the fuse. The connecting part between the flange 12 and the locking sleeve 5 is weakened by means of a groove 13, which diminishes the strength of the locking sleeve 5 at this point to such a degree that the locking sleeve 5 is torn from the flange 12 at the impact of the shell upon armor-plating, but is maintained by the said flange 12 upon impact with thin plating.

It is to be observed that although the needle holder according to the preceding description is set forth as being the movable part and the detonator cap the stationary part, this arrangement of course can be inverted, that is to say, the needle holder can be stationary and the detonator cap movable without departing from the spirit and scope of the invention.

Having now particularly described the nature of my invention and the manner of its operation, what I claim is:—

1. A fuse of the character described including an attaching body having a recess opening at its outer end, a bursting charge mounted through the inner end of the body and in communication with the recess, a securing member mounted in the recess provided with a cylindrical channel, cooperative igniting members on the securing member including a needle and a detonator cap, one of which is spring controlled and movable relative to the other and provided with a small channel, and locking means mounted on the securing member including a breakable retaining member.

2. A fuse of the character described including an attaching body having a recess opening at its outer end, a bursting charge mounted through the inner end in communication with the recess, a securing member mounted in the recess and closing the outer end thereof and provided with a cylindrical channel, a detonator cap mounted in the securing member, a needle carrier slidably mounted in the cylindrical channel of the securing member, a compression spring arranged between the inner end of the recess and the needle carrier, the needle carrier being provided with a small channel and also provided with an external groove, a clutching ball in the wall defining the cylindrical channel and engageable with the groove to hold the needle carrier in a retracted position, a locking sleeve arranged about the wall defining the cylindrical channel and the inner end of the recess and slidable in the recess, and a breakable annular retaining member secured to the body by the securing member and normally holding the locking sleeve over the clutching balls, substantially as and for the purpose set forth.

3. A fuse as claimed in claim 1, wherein the locking means includes a clutching ball removably mounted in the wall defining the cylindrical channel and engaging the movable igniting member, and a locking sleeve surrounding said wall for holding the ball in position and secured to the body and having a groove therein so as to render the sleeve breakable upon the action of the predetermined impact.

In testimony whereof I affix my signature.

ERNST JOHAN TORSTEN WENNERSTRÖM.