

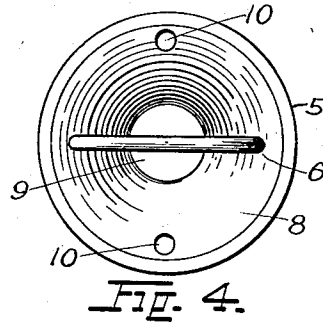
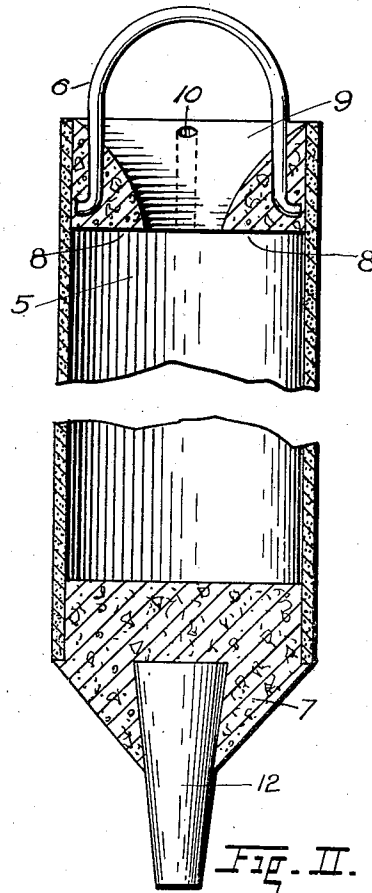
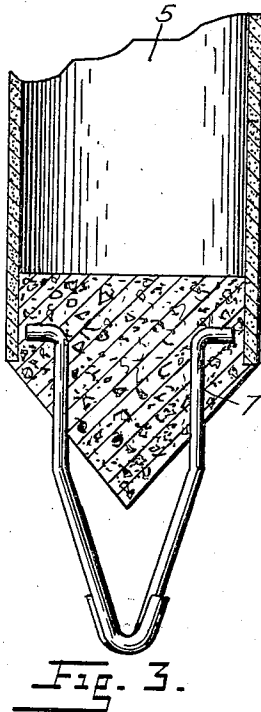
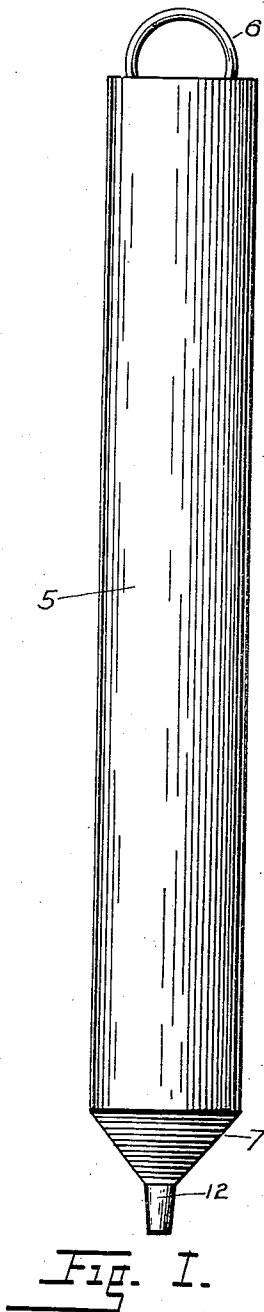
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NITROGLYCERIN SHELL

Filed March 23, 1926



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UNITED STATES PATENT OFFICE

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NITROGLYCERIN SHELL

Application filed March 23, 1926. Serial No. 96,783.

This invention relates to containers for nitroglycerin and other high explosives, of the general type used in connection with wells to lower an explosive charge to the bottom portion thereof.

It is an object of the invention to provide a container of the above described character which can not heat by friction or other causes to a temperature approaching the firing point of the explosive, and which thereby completely eliminates the ever present source of danger of premature explosion due to heat generated while the charge is being lowered into the well.

Another object of the invention is to provide a container which additional to the above mentioned characteristic property, has the advantage of being shattered and completely destroyed by combustion when the explosion takes place; a further object is to provide an improved method of fastening a bail and an anchoring device in operative relation to the container and still other objects reside in details of construction as will fully appear in the course of the following description.

An embodiment of the invention has been illustrated in the accompanying drawings in which like characters of reference designate corresponding parts throughout the several views and in which

Figure 1, represents an elevation of the improved container;

Figure 2, an enlarged, fragmentary sectional view of the upper and lower portions of the container;

Figure 3, a similar view of the lower portion of the container, showing the provision of a suspension device at the end thereof, and

Figure 4, a top view of the container.

Referring further to the drawings, the container consists of a cylindrical shell 5 having at its upper, open end a bail 6 for its connection with a torpedo line, and provided at its lower extremity with a closed bottom and preferably with a means for attaching an anchor or with a means for the suspension of weights or other shells.

The improved method of connecting the bail at the upper end of the shell consists in

molding or otherwise fastening in the extreme portion of the same, a plug 8 of any suitable moldable material that will harden in place, and inserting the ends of the bail therein while the material is still soft.

The extremities of the bail may be bent as shown in Figure 2 of the drawings and the plug, when hardened, will securely hold it in position and permit of its sustaining a considerable weight without breakage or displacement.

The plug has a central funnel-shaped opening 9 to facilitate the supply of explosive to the container and it is furthermore provided with one or more holes for the escape of air while the explosive is being poured into the funnel.

The container is closed at its lower end by a plug 7 also made of molded material, in which may be embedded an anchor tip 12 to attach an anchor and to hold the container in place at any desired distance from the bottom, or a suspension device such as the lapping hooks 13 shown in Figure 3, for the connection of weights or of other similar containers in case it is desirable to increase the quantity of the charge lowered into the well at one time.

The material of which the plugs are made may be cement or gypsum or a graphitic compound or any other moldable material that will harden in place and capable of resisting strains.

The cylindrical wall of the container is made of paper or other suitable plastic substance impregnated with a material that will soften at a temperature below the firing point of nitro glycerin or other high explosive.

Paraffine, pitch and hard wax are suitable for the purpose but it is preferred to use sulfur, not only by reason of its low melting point but also because of its being frangible when hardened and at the same time coherent and binding to the material with which it is intermixed.

The paper impregnated with the sulfur may be molded or otherwise formed into the required shape or the paper may be first formed and then impregnated as may be found most convenient and the shell thus

constructed and closed at its lower end as hereinbefore described, is particularly adapted to be used as a container for the safe conveyance of a high explosive to the bottom of a well.

The shell is impervious to moisture, which permits of its carrying liquid nitro glycerin or of its passing into fluid in the well without rupture or deformation; it is strong, hard and durable to resist wear by contact with the walls of the well and to prevent breakage under stresses; it is heavier than water or oil thereby insuring its passage into liquid when it is lowered into a well, and it will shatter into bits upon the explosion of its contents and thereby avoid the presence of obstructive pieces often encountered in the use of metal shells.

The outstanding property of the shell of the present invention is, however, its resistance to local super-heating by friction or other causes.

The sulfur or other suitable substance with which the paper of which the shell is composed, is impregnated, softens at a temperature far below the firing point of nitro glycerin (205° C.) so that in the event of the shell being heated by frictional contact with the wall of the well into which it is lowered, its wall will gradually soften and prevent the temperature from increasing to a point even approaching that at which the nitro glycerin fires, by cushioning further friction and by absorption of the heat, it being apparent that, the latent heat of the material being taken into consideration, the frictional heat will be absorbed without readily raising the temperature of the material up to the melting point of sulfur (under 120° C.) and that even then further heat may be absorbed with but slight, and for the purpose of the present invention, immaterial increase in temperature.

The cushioning effect obtained when the shell is softened by heat, opposes the tendency of generating further heat by friction, and aids in minimizing the temperature to which the container may be heated during its passage to the bottom of the well.

It will thus be understood that my improved shell provides an efficacious safeguard against the accidental ignition of its explosive contents while it furthermore protects the explosive against the penetration of moisture; is capable of withstanding abrasion by contact with the walls of the well; and is sufficiently hard and brittle to shatter into bits when the explosion takes place.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. A container for an explosive charge in shooting wells, comprising a normally frangible and brittle wall having the quality of

softening locally and temporarily under frictional heat.

2. A container for an explosive charge in shooting wells, having a normally frangible wall composed of sulfur-impregnated paper.

3. A container for an explosive charge in shooting wells, comprising a normally frangible shell of sulfur-impregnated paper, a frangible plug at an end of the shell, and a suspension-member at the other end of the same.

4. A container for an explosive charge in shooting wells, comprising a normally frangible shell of sulfur-impregnated paper, a frangible plug at an end of the shell, a frangible reinforcing ring at the other end of the shell, and a suspension-member anchored in the ring.

5. A container for an explosive charge in shooting wells comprising a tubular wall having a closure at each end thereof, said wall being composed of a material which will harden to a brittle frangibility when cold and which will soften locally and temporarily under frictional heat.

6. A container for an explosive charge in shooting wells, comprising a normally frangible shell of sulfur impregnated paper, a frangible plug of moldable material at an end of the shell, having a bail embedded therein and a frangible ring of moldable material at the other end of the shell having a separable suspension device embedded therein.

7. A container for an explosive charge in shooting wells, comprising a normally frangible shell of sulfur impregnated paper, a frangible plug at an end of the shell, a frangible reinforcing ring at the other end of the shell, said reinforcing ring being funnel shaped and having an air port therethrough, and a suspension member having its ends embedded in said ring.

8. A container for an explosive charge in shooting wells, comprising a normally frangible shell of sulfur impregnated paper, a frangible plug at an end of the shell, a frangible reinforcing ring at the other end of the shell, said reinforcing ring being funnel shaped and having an air port therethrough, and a suspension member having its ends embedded in said ring, and an anchoring member embedded in said plug.

9. Oil well torpedo casing comprising as its explosive container a tube of fibrous material impregnated with material brittle under the shock of detonating high explosive.

In testimony whereof, I hereunto affix my signature.

WARREN F. BLEECKER.