

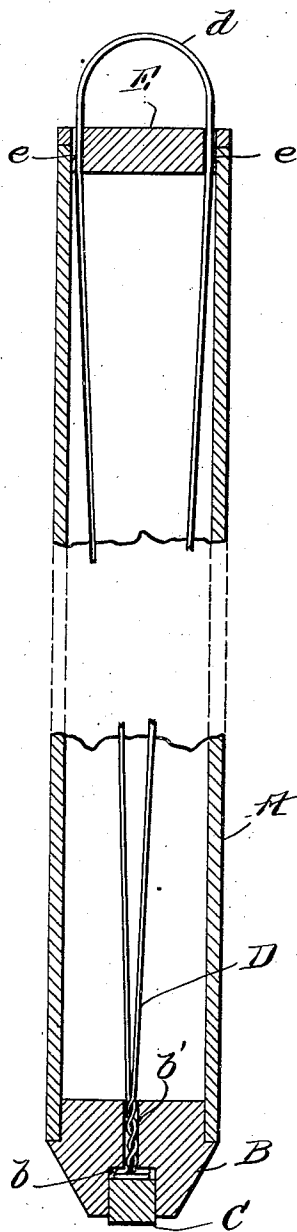
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F. A. SANDERS

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OIL WELL TORPEDO CONTAINER

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UNITED STATES PATENT OFFICE

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OIL-WELL-TORPEDO CONTAINER

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My invention relates to oil well torpedo casings, and has for its object the provision of an efficient container for nitroglycerine or other high explosive, such as are employed
5 for "shooting" oil wells, and which, by the detonation of the explosive charge contained in it, will be reduced to granules or small fragments which will in no sensible degree interfere with subsequent operations. Prefer-
10 erably also my object involves the employment of such material, for, or in, the constitution of the torpedo casing as will further soften and disintegrate when the fragments thereof, produced by the explosion of the tor-
15 pedo, are subjected to the action of petroleum.

The metal torpedo casings heretofore in use have given trouble in operations subsequent to the shooting of an oil well because
20 the metal though torn and disrupted, is fractured only at lines of relative weakness, and in large part retains its integrity as sheet metal.

In the drawing hereto annexed, which
25 illustrates an oil well torpedo embodying my invention, A represents the tubular shell of the container, which may be of any dimensions required; B a plug, as of wood, which fits in and should be cemented to, the shell
30 A, so as to be tight against leakage of liquid either in or out; C a stopper which closes the recess *b* in the lower end of the plug B; D a suspension wire, passing through the hole
35 *b'* which pierces the axis of the plug B; E a plug for the upper end of the tubular container A, perforated as at *e, e*, for the passage of the wire D, which is looped at *d* for the engagement of a hook or grapple, such as is used on the lowering cable.

The material of which the tubular shell A is constructed, according to my invention comprises a substance which is inherently brittle and subject to conchoidal fracture under sudden shock. For example, the sub-
45 stance of this character, preferred and recommended, is an asphalt which, at the temperatures encountered at the bottom of oil well borings, is hard enough to fracture conchoidally when subjected to the impact or
50 shock of explosion of the torpedo charge.

Asphalt containing gilsonite will be found suitable for the purpose.

Brittleness, as of asphalt, as is well known, is a term of relative significance; cold and apparently hard asphalt, stressed gently but persistently, will betray its essentially col-
loidal character, and will flow, whereas a light blow of a hammer will fracture it. Conversely, at temperatures high enough to
60 soften an asphalt sensibly, an impact sufficiently violent and abrupt will nevertheless produce conchoidal fracture. Under such extremely abrupt shock as that produced by detonation of nitroglycerine, an asphalt
65 seemingly soft to ordinary application of stress or pressure, is none the less brittle.

In order to afford sufficient strength and toughness for normal service, the essentially brittle material, such as asphalt, should be reinforced. The structural composition
70 which I prefer for the tubular container A, comprises interlacing or felted fibres, the fibrous body being thoroughly saturated with asphalt in a hot and freely fluid condition. The fibrous material may be of any
75 specific character, vegetable fibre, wood pulp, sulphite pulp, will serve; and if felted, and built up in helical laminations into a tube of appropriate thickness and density,
80 will serve admirably as the basis or framework to be associated with asphalt by thorough saturation after the tubular fibrous body has been dried so as to free the inter-
fibre voids of all moisture.

This saturation surrounds and embeds the fibres in asphalt. Asphalt is the material preferred for the purposes of this invention, because it is not only brittle (in the sense
85 above prescribed) but also is miscible or soluble in constituents of petroleum itself. Because of this property of solubility in petroleum constituents, a torpedo container comprising asphalt may be well painted outside
90 with material which is not thus attacked by petroleum; though this precaution is hardly necessary, since the torpedo casing will seldom if ever be allowed to remain in the well-boring more than a few hours before detona-
95 tion, a time wholly insufficient to produce any substantial dissolution of the asphalt. 100

When a torpedo encased in a container consisting wholly or chiefly of an asphalt-impregnated fibrous body is detonated, the shock of explosion shatters the asphalt into granules or small fragments, the fibres, embedded or anchored in the asphalt being ruptured across each of the multitude of asphalt-fractures. The comminuted material which composed the torpedo casing—even though it be insoluble or immiscible in petroleum constituents,—will be of no more account than so much sand or granulated rock, so far as it affects subsequent operations on the oil well. And, when a material such as asphalt has been employed, if by an improbable chance any large part of it remained unshattered, the disintegrating action of the petroleum will eliminate it.

I claim:

1. Oil well torpedo casing having an explosion container comprising an asphalt brittle under the shock of detonating high explosive and substantially continuous through the body of the said container.
2. Oil well torpedo casing comprising in its container a tube of fibrous material impregnated with material brittle under the shock of detonating high explosive and soluble in petroleum constituents.
3. Oil well torpedo casing comprising as its explosive container a tube of fibrous material impregnated with an asphalt brittle under the shock of detonating high explosive.
4. Oil well torpedo casing comprising in its container a tube of fibrous material impregnated with an asphalt brittle under the shock of detonating high explosive and soluble in petroleum constituents.
5. Oil well torpedo casing comprising in its container wall material brittle under the shock of detonating high explosive, soluble in petroleum constituents, and substantially continuous through the body of the said wall.
6. Oil well torpedo casing comprising in its container wall asphalt brittle under the shock of detonating high explosive, soluble in petroleum constituents, and substantially continuous through the body of the said wall.

Signed by me at Tulsa, Oklahoma, this 9th day of December, 1926.

FLOYD A. SANDERS.