

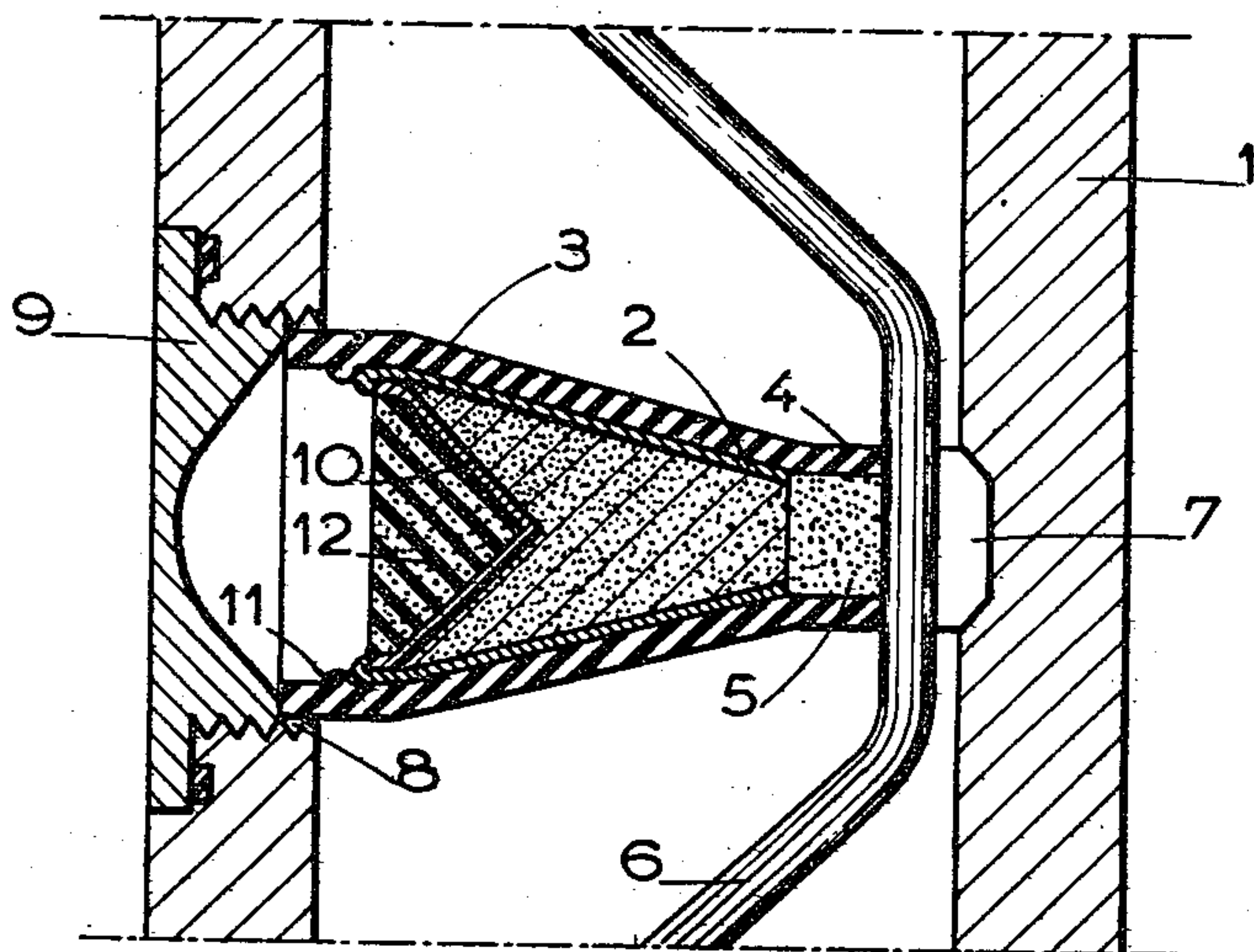
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J. DELACOUR

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SHAPED CHARGES ADAPTED FOR USE INSIDE WELL CASINGS

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Inventor:
Jacques Delacour
By: Campbell, Brumbaugh, Hartman
His Attorneys

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SHAPED CHARGES ADAPTED FOR USE INSIDE
WELL CASINGS

Jacques Delacour, Paris, France, assignor, by mesne assignments, to Borg-Warner Corporation, Chicago, Ill., a corporation of Illinois

Application May 4, 1951, Serial No. 224,520

Claims priority, application France May 11, 1950

2 Claims. (Cl. 102—20)

My invention has for its object improvements in shaped charges adapted for use inside soundings with a view to perforating the inner casings of the wells.

It is a known fact that the charges used at the present time include generally speaking in their front part a conical liner made of a metal such as copper or steel that closes the chamber, whether empty or filled with material that is located to the front of the actual charge. Now, it has been found that the perforations provided were partly closed in their turn by a block of metal, whether copper or steel, as produced by the melting of the metal of a part of the liner at the moment of the explosion of the charge.

My invention has for its object to cut out this drawback. For this purpose, it consists in locating inside the cone a cellular substance such as hard rubber in sponge form. Under such conditions, it has been found that the metal block assumes a smaller size than the blocks formed in usual practice and that it was driven home into the target without closing the opening obtained by the explosion of the charge.

The single figure of accompanying drawing illustrates an embodiment of my invention. In said figure which is an axial vertical cross-section of a perforator, 1 designates the cylindrical body of the perforator inside which are located in superposed parallel planes different hollow or shaped charges, only one of which has been illustrated.

The arrangement of the charge may be in particular of the type disclosed in the copending application, Serial No. 128,950, dated November 23, 1949, now Patent No. 2,764,937, dated October 2, 1956, that has been assigned to the Société de Prospection Electrique, Procédés Schlumberger, who is also assignor of the present application. As disclosed in that application, the perforator

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1 comprises a hollow cylindrical pressure resistant housing closed at top and bottom by tightly fitting caps. The shaped charge is contained inside two elements, to wit: an inner frusto-conical element 2 forming the cover and the outer element 3 forming a sheath for the cover and assuming a corresponding shape. The small end of said sheath includes a cylindrical rear extension adapted to carry the priming charge 5 inside which passes the fuse 6 that is fitted inside a slot of the sheath 3. On the other hand, the corresponding end of the outer sheath 3 is housed inside a recess 7 provided to this purpose in the rear wall of the perforator body 1. The front end of the sheath 3 engages an opening 8 provided similarly to this purpose through the wall of the cylindrical body 1, which opening is closed by the threaded plug 9 adapted to be perforated at the moment of the explosion of the charge, as well known per se. Lastly, 10 designates the conical liner located to the front of the charge.

Now, according to the invention, there is provided in the concavity of said liner 10, in the manner disclosed hereinabove, a mass of hard rubber or ebonite in sponge formation 12. This hard rubber or ebonite in sponge formation may be replaced by any other cellular substance assuming substantially the same physical structure.

What I claim is:

1. In well casing perforating apparatus for use in deep wells containing a column of liquid, the combination of a hollow, watertight pressure resistant container adapted to be lowered into the well and having at least one opening formed in the side wall thereof, watertight and pressure resistant closure means for said opening, a shaped explosive charge supported in said container and having a forward hollowed out portion facing said opening and lined with a metallic liner, and a mass of hard cellular substance disposed in said container in front of said liner for reducing the size of the metal block formed from part of the material of said liner when said charge is detonated.

2. Well casing perforating apparatus as defined in claim 1 in which the cellular substance comprises a mass of hard rubber in sponge form fitted in the concavity of said liner.

References Cited in the file of this patent

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