Feb. 16, 1932. E. KATZ 1,845,971

EXPLOSIVE DEVICE AND THE LIKE

Filed May 24, 1929

Fig. 1

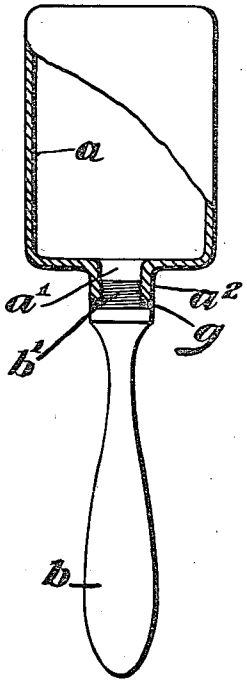
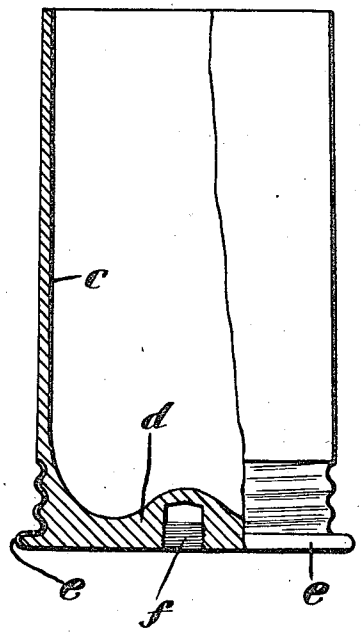



Fig. 2




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# UNITED STATES PATENT OFFICE

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## EXPLOSIVE DEVICE AND THE LIKE

Application filed May 24, 1929, Serial No. 365,708, and in Germany May 29, 1928.

This invention relates to casings or similar devices in which explosives are used or confined as for example cartridge or shell cases for munitional, pyrotechnical or like purposes.

Such devices require complete exclusion of moisture and must be gas proof and otherwise generally impermeable for which reason integrality is of the highest desirability as joints of any nature introduce factors of leakage and difficulty.

To this end I contemplate articles for the specified purposes capable of adaptation to varied requirement and free from joints or seams and of characteristics adaptable to a wide range of requirement.

I provide by my concept a new material or basis of fabrication for such articles which makes possible the manufacture of a variety of these requirements in new and newly functioning forms.

To produce hollow articles of this class ordinary requirements involve not only the jointless, seamless thing to be used, but other physical factors by reason of which composite articles have had to be used as for example, metal, wood, paper and other equally different materials. There are required in these articles such extremes as gas and water proofness and mechanical strength and machine-work adaptability as for turning, threading, drilling or grinding.

Such is in contra-distinction to previous structures and materials, such as wrapped paper cases and sheet metal combinations. As distinguished from wrapped paper and like bases of fabrication, my concept provides for an impregnation basis by which characteristics are developed which lend themselves to the previously stated desiderata of impermeability and mechanical workings.

As illustrative I will describe characteristic examples of the utility of my invention as in the accompanying drawings in which

Fig. 1 is a partly sectioned view of hand grenade, the charge and ignition device being omitted, and

Fig. 2 a partly sectioned view of a cartridge case.

These devices well illustrate the combined requirement heretofore met only with great difficulty and at high cost.

The grenade casing shown in Fig. 1 is formed of fibre pulp wet laid in a hollow die to form the seamless enclosing wall $a$ apertured as at $a'$ and provided with a sleeve like extension $a^2$.

Such a body is impregnated with an asphaltic, pitch-like or gummy penetrant which permeates the fibrous wall and converts the soft and generally porous body into a damp and gas proof member. In addition to this it makes of the fibre body a cohesive article capable of submission to tooling operations such as turning, threading, drilling and like machine work where the casing $a$ must be prepared to tightly receive a fitting such as the threaded end $b'$ of the handle $b$. To this end the collar $a^2$ may be cut with an internal thread and so worked without crumbling or cracking the material.

Where such articles are so machined I preferably re-coat the surface with the original or a like impregnating compound, and this may be advantageously accomplished at the time of the assembly of the handle $b$ as it then constitutes also a cementitious seal. In such assembly a gasket as $g$ may be used to further insure the complete sealing of the explosive chamber.

The shell casing shown in Fig. 2 illustrates a similar problem but of slightly different character. Here we have a cylindrical wall $c$ with flanged head $d$ capable of receiving the metallic driving band $e$. The shell wall $c$ and head $d$ are wet laid pulp as described and are as such integral and homogeneous in character of material, but moulded for the desired head flange and reinforcing thickness.

Such a moulded pulp shell is then impregnated as before described, and may be turned to accurate diameter and threaded or grooved to receive the metallic band $e$. It may be also drilled and tapped as at $f$ for its ignition member, the machined parts being re-surfaced or impregnated as before described.

Such an article as the shell casing of Fig. 2 represents a problem of extreme require-

ments of accuracy. As a composite shell casing it meets practical ordinance requirements and as an integral explosive casing it has a lightness and impermeability impossible in any previous composite or combined material shell or cartridge casing.

Such articles may have in addition to their impregnation coatings of metal, enamel, varnish or lubricative substances to give added protection as desired.

What I therefore claim and desire to secure by Letters Patent is:—

1. In a grenade, a gas and damp-proof chamber comprising a relatively thin enclosing wall of impregnated fibre of toolable coherency and having a relatively small neck having an internally threaded aperture, and a threaded attached member engaged therein and sealed thereto by a bonding material of impregnated character to reimpregnate the neck threads and bond the thread interengagement, said attached member having a shoulder above its threads and engaged with the neck and sealed thereto.

2. The device of claim 1 in which the attached member is a handle of material permeable to the sealing material.

3. In a device of the character described, including a gas and damp-proof chamber comprising a relatively thin enclosing wall of impregnated fibre of toolable coherency and having a relatively small neck having an internally threaded aperture, and a threaded attached member sealed thereto by a bonding material of impregnating character and itself permeable to such sealing material whereby the thread engagement is sealed and the neck threads reimpregnated.

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