

[54] **ELECTRIC PROPULSIVE CHARGE  
IGNITER**

3,295,446 1/1967 Harnau ..... 102/46

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F. Ross; Herbert Dubno[22] Filed: **July 31, 1973**[57] **ABSTRACT**[21] Appl. No.: **384,389**[30] **Foreign Application Priority Data**

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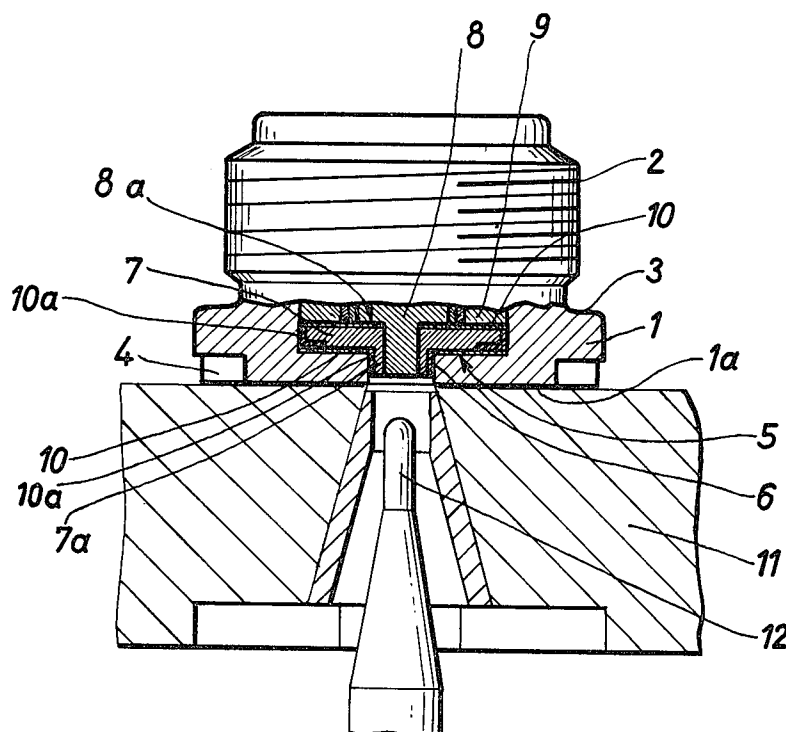
[52] U.S. Cl. .... **102/46**[51] Int. Cl. .... **F42b 9/08**

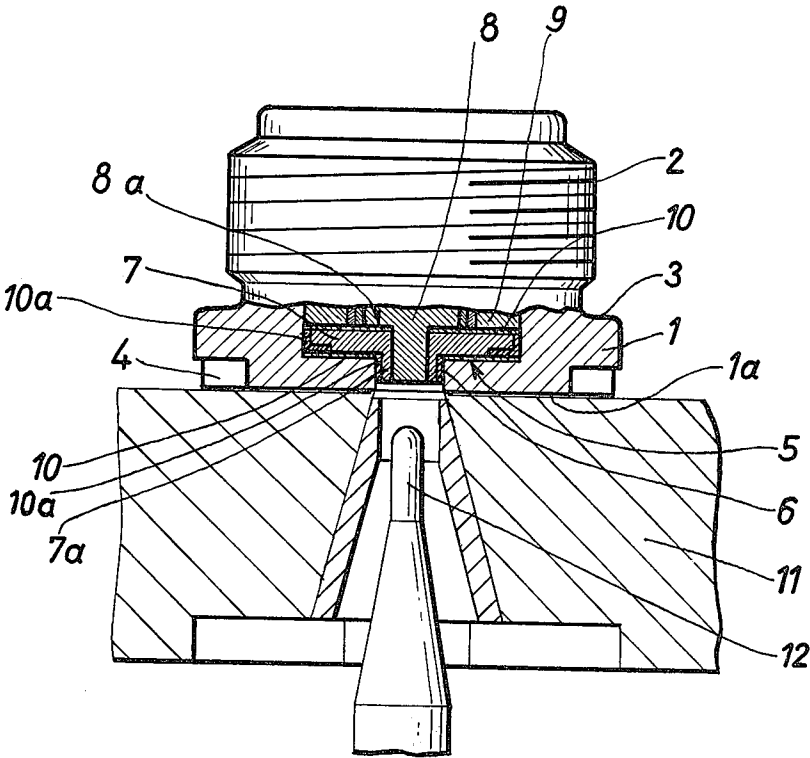
[58] Field of Search ..... 102/46

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An electric propulsive charge igniter comprising a primer body having a first shoulder. The primer body has a central bottom opening and an outer thread and is adapted to be screwed into a cartridge. The primer body has further a continuous axial opening provided with shoulders. A central contact is insulated from the primer body and combined with its ignition piece. A steel supporting annular disk and a central contact has a narrow shoulder and is associated with the steel supporting annular disk. The latter has a wide shoulder. The narrow shoulder is taken up by the wide shoulder. The supporting annular shoulder rests via its entire shoulder width against the shoulder of the primer body, and the primer body has a sleeve-like extension, passing through the central bottom opening up to the vicinity of the bottom as guide for the central contact.

**1 Claim, 1 Drawing Figure**



## ELECTRIC PROPULSIVE CHARGE IGNITER

The present invention relates to an electric propulsive charge igniter consisting of a primer body which is adapted to be screwed into the bottom of the cartridge and has a continuous axial opening provided with shoulders. In the opening there are arranged in succession, starting from the bottom, a central contact, which is insulated from the primer body and combined with an ignition piece, the primer composition and a transmission composition.

In such electric propulsive charge igniters, also known as electric threaded primers, blowouts frequently occur as a result of the gas pressure which is built up upon the ignition of the propulsive charge. The central contact, with the shearing off of its shoulders, is pressed through the opening in the bottom against the breechblock of the weapon. Aside from the fact that, in this way, a part of the power gas is discharged from the projectile and is thus lost, the operation of the weapon is endangered by the hot gases, and finally the operation of the breech mechanism itself can be impaired or the breech mechanism even damaged.

In the search for the causes of this defect it has been found that the central contact is not supported by the breechblock at the moment of the ignition. With a gas pressure of 4500 kp/cm<sup>2</sup> and more, the dreaded blowouts can thus occur, although they could be avoided if the central contact could rest with a wider shoulder against the primer body.

Since, on the one hand, the central contact is a part of the ignition piece, which is combined to form a mounting unit, there is no possibility for any significant change in the central contact. On the other hand, the bore within the breechblock, which receives the movable firing pin cannot be arbitrarily narrowed, so that narrow limits are established in this case also with respect to the structural possibilities.

It is thus one object of the present invention to provide, while avoiding the mentioned drawbacks and defects, an electric propulsive charge igniter, which is characterized by an extremely flat construction, which makes possible the use of the previously customary central contact and of the breechblock, and which has an internal arrangement self-supporting in such a manner that it withstands maximum gas pressures.

According to the invention a steel annular supporting disk is associated with the central contact in such a manner, that the narrow shoulder of the central contact is taken up by a broad shoulder of the supporting annular disk, the full shoulder width of which rests against a shoulder on the primer body and the sleeve-like extension of which passes through an opening of the primer body up into the vicinity of the bottom of the primer to form a guide for the central contact.

In accordance with another feature of the present invention, the central contact is provided via the supporting annular disk with an insulation from the primer body, which insulation has reinforcing layers serving as a seal.

Upon the ignition of the cartridge charge, therefore, the high gas pressure acting on the inner device of the propulsive charge igniter is taken up via the narrow shoulder of the central contact, both by the wide shoulder of the steel supporting annular disk and by a shoulder on the primer body, which in its turn fully supports the supporting annular disk.

These and other objects will become more readily apparent from the following detailed description, reference being made to the accompanying drawing, in which the sole FIGURE shows the charge igniter in partial axial section.

The propulsive charge igniter comprises essentially a cylindrical primer body 1, preferably of brass, on which there are provided an outer thread 2 for screwing it into an outer cartridge bottom, a stop shoulder 3 and a wrench surface 4.

On its inside, the primer body 1 has a continuous axial opening with a plurality of shoulders. Thus the inwardly facing shoulder 5 adjacent the bottom 1a of the primer body 1 terminates at a comparatively narrow central bottom opening or bore 6. A steel annular supporting disk 7, whose diameter corresponds approximately to the outside diameter of the shoulder 5 rests on the latter and has the downwardly directed sleeve-like extension or boss 7a which extends almost to the bottom or end face of bore 6. In the interior there is inserted the central contact 8, which terminates flush with end of the sleeve-like extension 7a approximately in the vicinity of the bottom and whose narrow shoulder 8a rests on the wide shoulder or upper face of the supporting annular disk 7. The central contact 8 is, as is known, combined with an ignition piece 9 adjoining the top of which are the primer and transmission compositions. The upper end of the propulsive charge igniter is closed by a moisture-proof covering plate.

The outer surfaces of the supporting annular disk 7, which come into contact with the primer body 1, are insulated. The insulation 10 comprises preferably a thin layer of plastic or synthetic material, which has a reinforcing layer 10a of a fiber-reinforced plastic or synthetic material, merely in the region of the transition from the end surface to the lower disk surface, and on the outside on the sleeve-like extension 7a.

Referring now to the drawing, it can be clearly noted, that the breechblock 11 of the weapon system requires a bore, serving to receive and advance the electric firing pin 12, which is larger than the diameter of the central contact 8 and practically as large as the central bottom opening 6 of the primer body 1. Thus a breech-sided supporting of the internal arrangement is not possible. Rather, the gas pressure which builds up in the charge chamber upon the ignition of the cartridge charge and which acts with the same force also rearward on the inner arrangement of the propulsive charge igniter can be distributed from the small surface of the central contact 8 to the large disk surface of the steel supporting annular disk 7, in which connection it has been found by tests that the entire inner arrangement retains its position unchanged upon firing.

While this surprising effect is to be ascribed essentially also to the large shoulder of the supporting annular disk, nevertheless the sleeve-like extension 7a serving as guide and mount for the central contact 8, as well as the fact that the central bottom opening 6 is narrower than the width of the narrow shoulder 8a of the central contact 8, also serve to protect the internal arrangement of the propulsive charge igniter even in case of extremely high gas pressures. Therefore, the dreaded "setting" does not occur. Only the insulation 10 forms an exception, particularly at the places at which reinforcing inserts 10a are provided, to the extent that as a result of the high gas pressure, the insulating material forces its way into the smallest gaps and channels and

thereby, in addition to assuring electrical insulation, also provides a mechanical seal.

The surprising effect that the safety of the inner arrangement is assured by a very balanced distribution of pressure is thus not obtained at the expense of a particularly heavy development of the primer body. Rather, it has been found that even with an extremely flat construction of the propulsive charge igniter, the same excellent action can be obtained.

I claim:

1. An electric primer for a weapon having a breechblock with a passage for a firing pin and for mounting in a cartridge, the primer comprising:

a primer body formed at one end with an external thread receivable in said cartridge, an external shoulder at the other end forming a stop for said body, and a end face at said other end adapted to rest against said breechblock, said body being formed with an axially extending chamber and with an internal shoulder defining said chamber at said other end, said other end being provided with an axially extending bore terminating at said internal shoulder and said face

communicating with said chamber;

a steel annular supporting disc received in said chamber and overlying said internal shoulder while being formed with a boss extending axially into said bore and terminating short of said end face;

a central contact axially engageable with said pin and having a projection substantially filling said boss, said contact being formed with a body portion resting against a surface of said disc turned away from said internal shoulder, said projection terminating flush with said boss;

an ignition piece surrounding said contact and bearing against said surface of said disc within said chamber;

a layer of insulation on said surface of said disc, around the periphery thereof, between said disc and said internal shoulder and surrounding said boss for insulating said ignition piece and said body from said disc; and

reinforcing means for said insulation at least along the periphery of said disc for providing a sealing action.

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