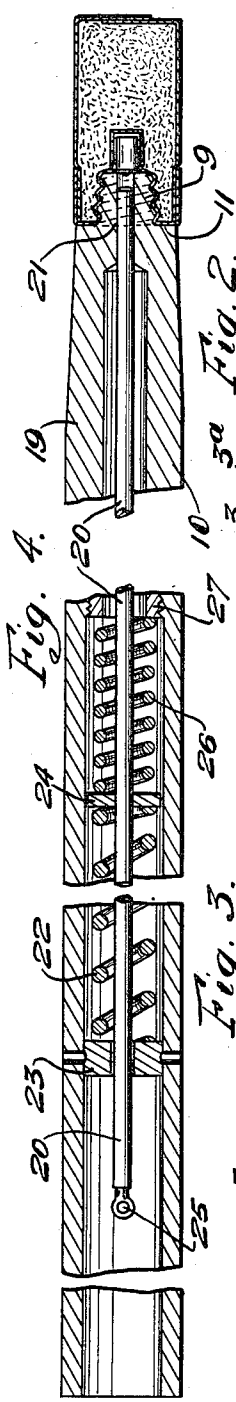
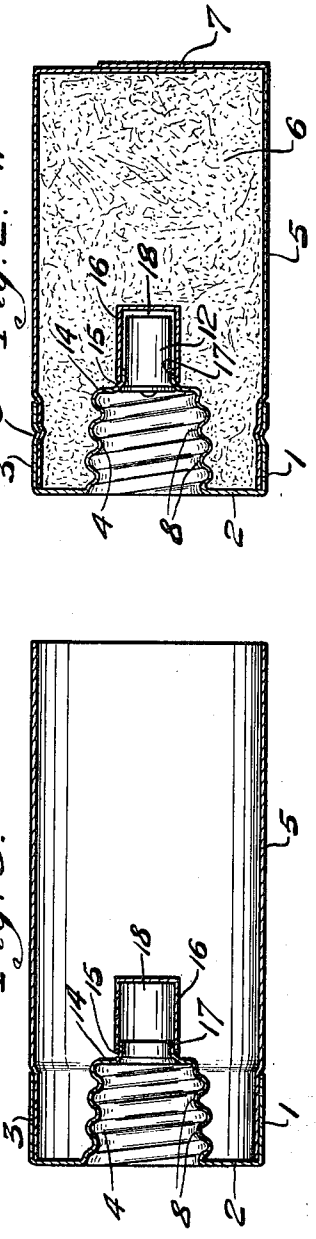
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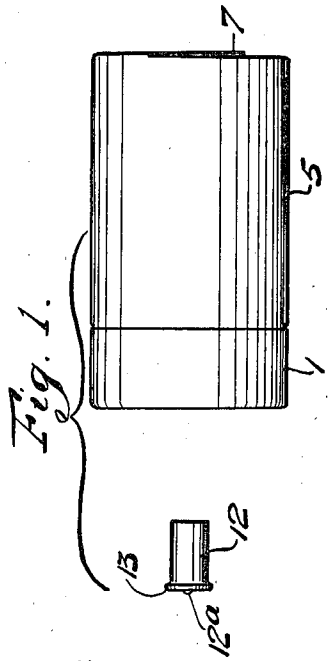
E. HUTTON

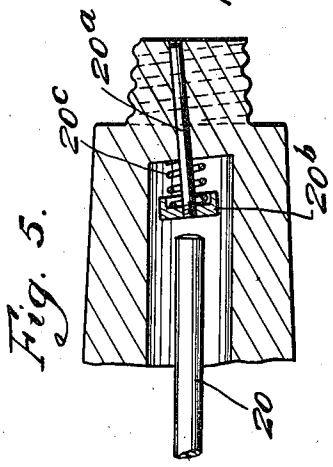
BLASTING CARTRIDGE

Filed July 24, 1924









Inventor

Ernest Hutton

By Wells L. Norris

Attorney

Patented Jan. 26, 1926. 1,571,122

UNITED STATES PATENT OFFICE.

ERNEST HUTTON, OF FAIRMONT, WEST VIRGINIA.

BLASTING CARTRIDGE.

Application filed July 24, 1924. Serial No. 727,973.

To all whom it may concern:

Be it known that I, ERNEST HUTTON, a citizen of the United States, residing at Fairmont, in the county of Marion and State of West Virginia, have invented new and useful Improvements in Blasting Cartridges, of which the following is a specification.

The present invention relates to improvements in cartridges adapted for use in connection with blasting guns of the kind used in mines and other locations for blasting coal, rock, and for similar operations, and to means for mounting such cartridges on or attaching them to blasting guns preliminarily to the blasting operations.

One of the primary objects of the invention is to provide a novel and improved cartridge which can be manufactured inexpensively and supplied in quantities to the users, to provide a cartridge of this kind which can be easily and quickly mounted on or attached to a blasting gun so that accidental displacement or detachment of the cartridge while the same is being placed in the blast hole is avoided, and to provide a blasting cartridge which is so constructed that it is adapted to receive a percussion primer or cap immediately prior to the placing of the cartridge on the gun, although the cartridges may be stored or handled separately from the primers or caps until the cartridges are to be used, thereby insuring safety in the storage and handling of the cartridges by preventing premature explosion thereof.

Another object of the invention is to provide novel and improved means for mounting the cartridges on or attaching them to blasting guns whereby the operations of placing the cartridges in the blast holes and of firing or exploding them may be carried out quickly and with facility and safety.

To these and other ends the invention consists in certain improvements and combinations and arrangements of parts, all as will be hereinafter more fully described, the features of novelty being pointed out particularly in the claims at the end of the specification.

In the accompanying drawings:—

Figure 1 is a collective view showing one of the blasting cartridges constructed in accordance with the present invention, and a separate percussion primer or cap therefor, the cartridge and primer being shown in separated or detached relation.

Figure 2 represents a section taken longitudinally or axially through the cartridge with the percussion primer or cap applied thereto.

Figure 3 represents a central longitudinal section through the casing or shell of the cartridge prior to the loading thereof with the explosive.

Figure 4 represents a longitudinal section through a blasting gun of the percussion type having means whereby the improved cartridge may be mounted thereon or attached thereto.

Figure 5 is a detail view on an enlarged scale of one end of a blasting gun having means for receiving the improved cartridge and embodying a firing pin adapted to fire or explode a percussion primer or cap of the "rim fire" type.

Similar parts are designated by the same reference characters in the several views.

Blasting cartridges embodying the present invention are particularly applicable for use in connection with blasting guns, especially blasting guns using a firing pin or equivalent means for firing the cartridge by percussion. Blasting guns of different kinds may be used in conjunction with the cartridges, and different means may be provided for mounting the cartridges on or attaching them to the guns, an example of one type of blasting gun and the preferred means of mounting the cartridges on or attaching them to such gun being shown in the present instance. The preferred form and construction of the improved cartridge is illustrated in the accompanying drawing and will be hereinafter described in detail, but it is to be understood that the invention is not restricted to the precise construction shown as equivalent constructions are contemplated and such will be included within the scope of the claims.

In the present instance, the cartridge comprises a base 1 which may be composed of thin metal, tough paper, or other suitable material which is suitably molded, stamped or otherwise formed to provide an end wall 2 which is preferably flat or substantially so, an outer or surrounding flange 3 and an internal socket 4. The cartridge also comprises a shell or container 5 which may be composed of paper or other material which possesses the requisite strength or toughness, this shell or container being preferably made from a tube of relatively tough paper,

as shown in Figure 3, one end of the tube being firmly secured or attached to the base, as by fitting it into the outer or surrounding flange 3 of the base and indenting the flange, as at 3a. The opposite end of the tube is open until the charge of explosive, designated 6 has been introduced therein, after which this end of the tube may be folded as at 7 or otherwise closed to form a closed container for the explosive.

The socket 4 is of a shape or construction depending upon the nature of the means provided on the blasting guns for the attachment of the cartridges thereto. In the present instance, this socket is in the form of a sleeve which is provided with threads 8 which are adapted to fit and screw upon a correspondingly threaded projection or boss 9 which extends forwardly and axially from the forward end of the gun 10. The socket in the cartridge is preferably so arranged that when the cartridge has been screwed into place on the forward end of the blasting gun, the end wall 2 of the base of the cartridge will seat or rest on a corresponding seat 11 on the forward end of the gun and surrounding the threaded projection 9 thereon.

The cartridge embodies a seat and receptacle for a primer or firing cap, a percussion primer or cap being preferably used. As shown, the cap, designated 12, is of the percussion type, it comprising a body which may be cylindrical or substantially so and a head which forms a rim 13. The cartridge is preferably adapted to receive such a primer or cap by forming the inner wall 14 of the socket 4 with an annular recess 15 into which the rim 13 on the primer or cap is adapted to seat, the primer or cap, when inserted into the cartridge, projecting beyond the socket and into the explosive charge 6, and in order to prevent part of the explosive charge from filling the space to be occupied by the body of the primer or cap, a sleeve 16 of paper or other similar material, closed at its inner end, may be provided, if desired, this sleeve, in the present instance, having its lower or open end fitted over a flange 17 which projects axially into the cartridge from the inner wall 14 of the socket. In this way, the sleeve 16 forms a chamber 18 to receive the body of the primer or cap.

It will be understood that when the cartridges are manufactured and sold or supplied to the users, the firing primers or caps will be omitted from the cartridges and may be supplied and stored separately from the cartridges, and that the primers or caps are applied to the cartridges immediately prior to their use. In this way, danger of premature firing of the cartridges is avoided.

As stated, blasting guns of different kinds may be used for placing and firing blasting cartridges embodying the present invention. One type of percussion blasting gun is shown as an example in Figure 4, it comprising a body 19 of suitable size and length to fit into the drill holes, and a reciprocatory rod 20 which is guided to move axially or longitudinally of the gun, its forward end working through an axial bore 21 which extends through the cartridge attaching projection or boss 9 and serving as a firing pin for exploding the percussion primer or cap. The rod 20 is actuated to fire the primer or cap contained in a cartridge applied to the gun by a spring 22, one end of which bears against a fixed abutment 23 within the gun and the other end of which bears against a collar or shoulder 24 which is fixed on the rod, 20, the rear end of the rod being provided with an eye 25 or other suitable means by which it may be drawn rearwardly or retracted and then suddenly released in order that the spring 22 may propel it forwardly and thus cause its forward end to strike the percussion primer or cap. A second spring 26 which acts in opposition to the spring 22 but which is preferably of less strength, may be used to normally hold the forward end of the rod 20 out of contact with the percussion primer or cap and thus avoid danger of premature firing of the primer, this spring, as shown, bearing at one end against the forward side of the collar or shoulder 24 and abutting at its opposite end against a shoulder 27 which is suitably fixed within the gun.

The gun shown in Figure 4 is adapted to fire percussion primers or caps of the "center fire" type, that is, those having the primer 12a located centrally of the rim 13, the rod 20 of the gun being alined axially with the primer 12a of the cap. In some instances, however, it may be desirable to use percussion caps for the cartridges which are of the "rim fire" type, that is, those constructed to be exploded by percussion upon the rim 13 of the cap. In such cases, the blasting gun may be constructed so that its firing pin will register with or strike the rim of the cap contained in the cartridge when the cartridge is applied to the gun. For example, as shown in Figure 5, the forward end of the gun may be provided with a firing pin 20a which is offset with respect to the longitudinal axis of the gun so that it will strike the rim of a percussion cap contained in a cartridge when such cartridge is applied to the gun. In such cases, the reciprocatory rod 20 of the gun may be shortened accordingly and arranged to strike a head 20b attached to the firing pin 20a, and the spring 20c may be provided for the purpose of normally holding the firing pin 20a in a retracted position so that its forward end will be normally out of contact with the rim of a percussion cap contained in a cartridge which may be applied to such gun.

Blasting cartridges embodying the present invention enable such cartridges to be manufactured, stored and handled without danger of exploding them, as it is not necessary to apply the primer, cap or other firing means thereto until immediately before each cartridge is applied to the blasting gun preparatory to its insertion into the blast hole. By constructing the cartridges with means, such as that shown, for mounting them on or attaching them to blasting guns which are correspondingly constructed to receive them, the cartridges may be easily and quickly mounted on the gun and placed properly in the blast holes without liability of detachment, and by constructing the socket in the base of the cartridge of paper or other easily destructible material, the socket and base of the cartridge will be shattered by the force of the explosion of the cartridge so that it will be unnecessary to manually detach the fragments of an exploded cartridge from the projection or boss of the gun in order to place another cartridge thereon. In some cases, as where the explosive charge is of a suitable nature, the shell which provides the receptacle for the body of the percussion cap may be omitted and instead thereof, the necessary space for the body of the cap may be molded in the explosive charge and such space may be preserved by the relatively solid nature of the explosive used. It will be understood that any means equivalent to that shown may be employed for mounting the cartridges on or attaching them to the blasting guns, the means hereinshown and described being the preferred means for readily and securely mounting the cartridges on the guns.

I claim as my invention:—

1. A blasting cartridge embodying a base having a socket formed therein for attachment to a blasting gun, and an explosive-charge-containing portion connected to the base, the base and socket being attachable as a unit to a blasting gun.

2. A blasting cartridge comprising as a unit a body adapted to contain an explosive charge and having a socket in one end thereof to fit removably onto an attaching projection on a blasting gun.

3. A blasting cartridge comprising a unitary body having a chamber to contain an explosive charge and provided at one end with a socket for attachment removably to a blasting gun and with a chamber to receive a primer.

4. A blasting cartridge comprising a body to contain an explosive charge and having formed as a unit therewith a socket extending into one end thereof for attachment removably to a blasting gun, the inner end of said socket being provided with a seat to receive a primer.

5. A blasting cartridge for use with a blasting gun having a cartridge attaching projection at its forward end, comprising a unitary body to contain an explosive charge and having a socket formed in an end thereof to fit removably on the attaching projection on the gun, and a primer in said socket.

6. A blasting cartridge comprising a body to contain an explosive charge, and a base connected thereto and formed with an attaching socket for removable attachment to a blasting gun and a primer-receiving seat at the inner end of the socket.

7. A blasting cartridge for use with a blasting gun having an attaching projection extending axially therefrom and a firing device extending axially through such projection, comprising a body to contain an explosive charge and having at one end an inwardly extending socket to fit onto the attaching projection of the gun, and a seat centered axially at the inner end of the socket to receive a percussion primer and to operatively position it relatively to the firing device of the gun.

8. The combination of a blasting gun having a projection extending axially from its forward end, and having a firing pin reciprocable axially through said projection, and a blasting cartridge containing an explosive charge and having a socket at one end to receive said projection on the gun and a primer containing chamber at the inner end of the socket for positioning a percussion primer in operative relation with the firing pin of the gun.

In testimony whereof I have hereunto set my hand.

ERNEST HUTTON.