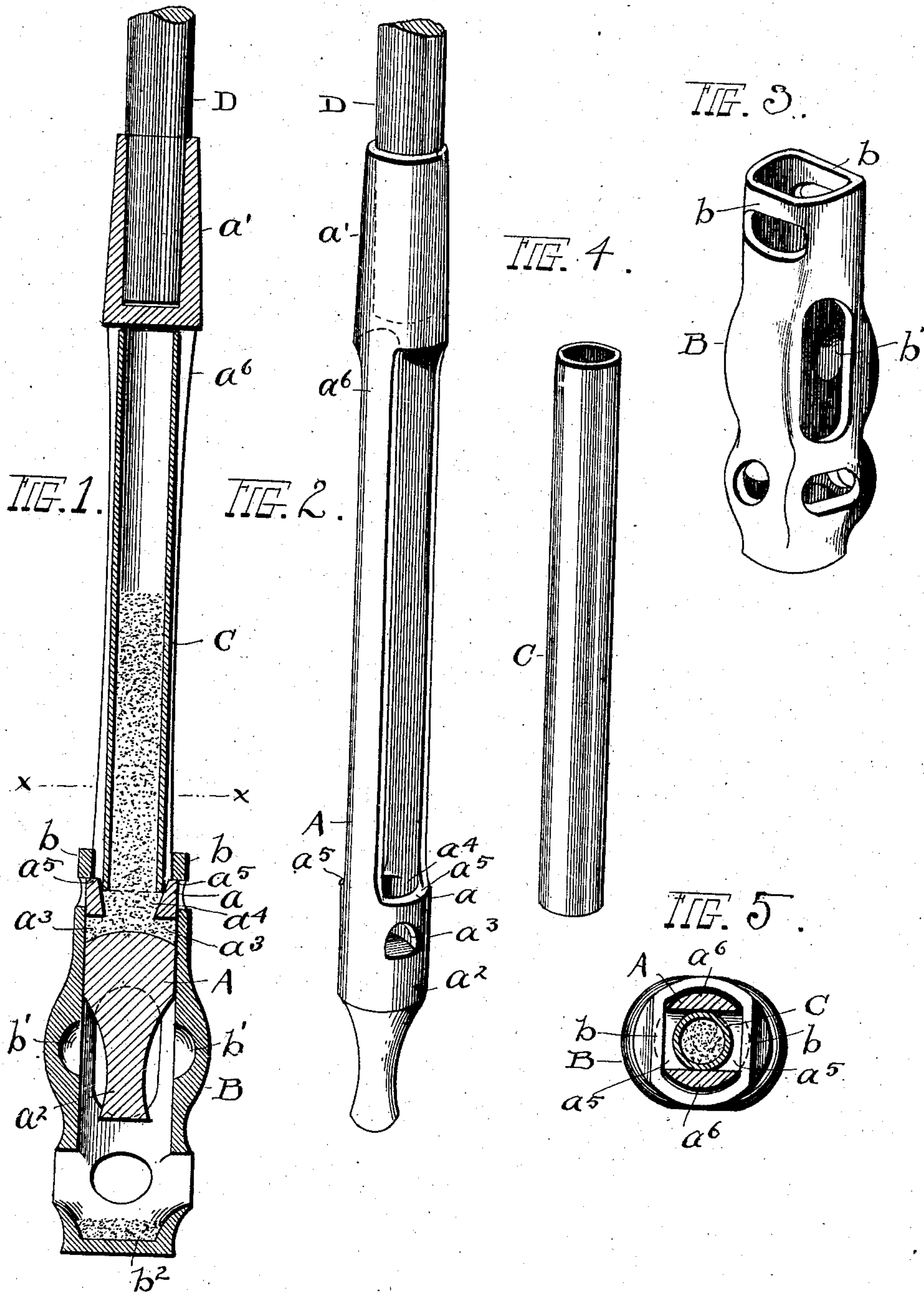


No. 850,353.

PATENTED APR. 16, 1907.

A. DELGRANDE & N. DEL GRANDE.  
REPEATING DETONATING CANE.

APPLICATION FILED MAR. 14, 1904.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

ANTONIO DELGRANDE AND NICHOLAS DEL GRANDE, OF BEREA, OHIO.

## REPEATING DETONATING-CANE.

No. 850,353.

Specification of Letters Patent.

Patented April 16, 1907.

Application filed March 14, 1904. Serial No. 198,109.

*To all whom it may concern:*

Be it known that we, ANTONIO DELGRANDE and NICHOLAS DEL GRANDE, citizens of the United States, residing at Berea, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Repeating Detonating-Canes; and we do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to repeating detonating-canes; and the invention consists in a cane adapted to use loose ammunition or explosive in granulated or powdered form and adapted to be fed into the explosion-chamber in definite quantities measured and limited by the cane itself, all substantially as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of our new and improved cane, and Fig. 2 is a perspective elevation of the plunger. Fig. 3 is a perspective view of the explosion-head, and Fig. 4 is a perspective view of a powder or ammunition tube. Fig. 5 is a cross-section looking down on line  $x x$ , Fig. 1.

As thus shown, the invention is adapted to be used only and exclusively with a powdered or granulated explosive, which is supplied by a tube filled with the same and inserted in the cane, and the cane is constructed to feed only a given quantity or charge to the explosion-chamber at a time, whereby a repeating cane is produced which can be fired so rapidly that the explosions practically become continuous, and there is no danger of back-firing or of clogging the passages, as in torpedo-canes, because the explosive used cannot be ignited by fire.

To these ends we construct the cane with a body A and an explosion-head B, suspended thereon and having the said body adapted to reciprocate therein within limitations, as will be seen. The said body A is open centrally between its ends  $a'$  and  $a^2$  and adapted to receive the tube C from either open side, and the said tube rests down in the neck  $a$  of the plunger-head  $a^2$  and under the socket-head  $a'$  at its top, and is thus confined and held within the body A during the use of the cane.

The plunger-head  $a^2$  has side openings  $a^3$  in open communication with the chamber  $a^4$  beneath tube C; but otherwise the head  $a^2$  is closed so completely within the walls of ex-

plosion-head B that no powder or explosive can work down between them, and the explosion-head has side bars or straps  $b$  at its top which are adapted to be bent inward and engaged over the shoulders  $a^5$  on the top of plunger-head  $a^2$  and serve to limit the drop of the explosion-head with respect to the plunger and to hold it thereon in proper working position.

The explosion-head B has cavities or pockets  $b'$  on its inside adapted to register with the side openings  $a^3$  when the plunger is depressed and receive a charge of the explosive from passages  $a^3$ . As such depression occurs the openings  $a^3$  will come down and be opposite the cavities  $b'$ , and said cavities will fill with explosive, so that when the plunger-head is again raised the explosive in said cavities will be discharged into the bottom of the explosion-head and be ready to fire by a downward stroke of the plunger. This operation can be repeated as rapidly as one can raise and lower the plunger in respect to the explosion-head, so that a rattling fire can be maintained by a single cane.

The handle or stem D is socketed in the top of head  $a'$ , and thus the entire device consists of simply three several elements A, B, and D, excepting the tube C, which contains the explosive and which is a separate article of manufacture and sale and is prepared and filled for use, so that as one tube is exhausted it can be thrown away and replaced by another without any material loss of time or special labor to make the exchange.

Head B is prevented from turning by the cross-strips  $b$ , engaged across the straight edges  $a^5$  of body A at each side, as shown in Fig. 5, and which also limit the play of plunger and explosion-head relatively to each other.

A charge of ammunition or explosive as herein defined comprises the capacity of cavities  $b'$ , which may be larger or smaller, and the explosion-head contains the explosion-chamber with its bottom at  $b^2$ . However, the form and arrangement of the parts is of less consequence in this instance than their adaptation to handle and explode unfixed or loose ammunition, and their construction may be considerably changed and remain within the scope of the invention. By "unfixed" ammunition we mean that which is in a loose form and not like a torpedo, which is a complete article in itself and made up to be individually used and handled. Any suit-



able kind of ammunition-receptacle can be used, and it need not be a tube nor removable, but the latter form is preferable. An obvious and equivalent construction would be a hollow or tubular cane with a cap-covered top to receive the powder instead of an inserted tube of less than the full length of the cane, as shown.

What we claim is—

1. A detonating device comprising an explosion-head, a body member having a plunger reciprocally connected to said explosion-head, a removable receptacle for an unfixed explosive supported by said body member, and means for dividing said explosive into charges and feeding the same into said explosion-head, substantially as described.

2. The device comprising an explosion-head and body member having a plunger reciprocally connected, and a receptacle for an unfixed explosive removably supported in said body member, said parts constructed to measure the quantity of explosive to the explosion-chamber with each reciprocation of the parts, and the said body having a cavity beneath said receptacle to receive the explosive and lateral outlets therefor at the bottom of said cavity, and the said head having cavities to measure the explosive received through said outlets.

3. A detonating device comprising a body, a handle at one end thereof, a plunger at the opposite end, said body having a space between said handle and said plunger, a removable magazine adapted to be supported within said space, an explosion-head fitting closely around said plunger and reciprocating thereon, and means for connecting said space to said explosion-head, substantially as described.

4. In a detonating device, the combination, with an explosion-head, of a plunger fitting closely in said explosion-head and reciprocating therein, said plunger having a re-

cess therein, a removable magazine adapted to have one end inserted in said recess, arms thereon forming a support for said magazine, and means for connecting said recess with said explosion-head, substantially as described.

5. A detonating device comprising a body portion, a lug at one end of said body portion having a recess therein adapted to receive a handle, a plunger at the opposite end thereof, a space formed between said lug and said plunger, a magazine adapted to be supported in said recess, an explosion-head fitting closely around said plunger and reciprocating thereon, and means for connecting said magazine with said explosion-chamber, substantially as described.

6. A detonating device comprising a body and a handle in the end thereof, of a plunger at the opposite end thereof, a magazine, means between said handle and said plunger for removably holding the magazine, an explosion-head closely surrounding said plunger and reciprocating thereon, a measuring-cavity formed in the wall of said explosion-head, and a passage in said plunger adapted to connect said magazine with said measuring-cavity, substantially as described.

7. In a detonating device, the combination, with an explosion-head and a body portion carrying a plunger and having a cut-away portion intermediate its ends, of a magazine adapted to be removably mounted in said cut-away portion, and means for connecting the same with said explosion-chamber, substantially as described.

Witness our hands to the foregoing specification this 27th day of February, 1904.

ANTONIO DELGRANDE.  
NICHOLAS DEL GRANDE.

Witnesses:

R. B. MOSER,  
C. A. SELL.