

June 14, 1932.

J. W. MacDONALD

1,863,062

TOY CANNON

Filed Dec. 13, 1930

2 Sheets-Sheet 1

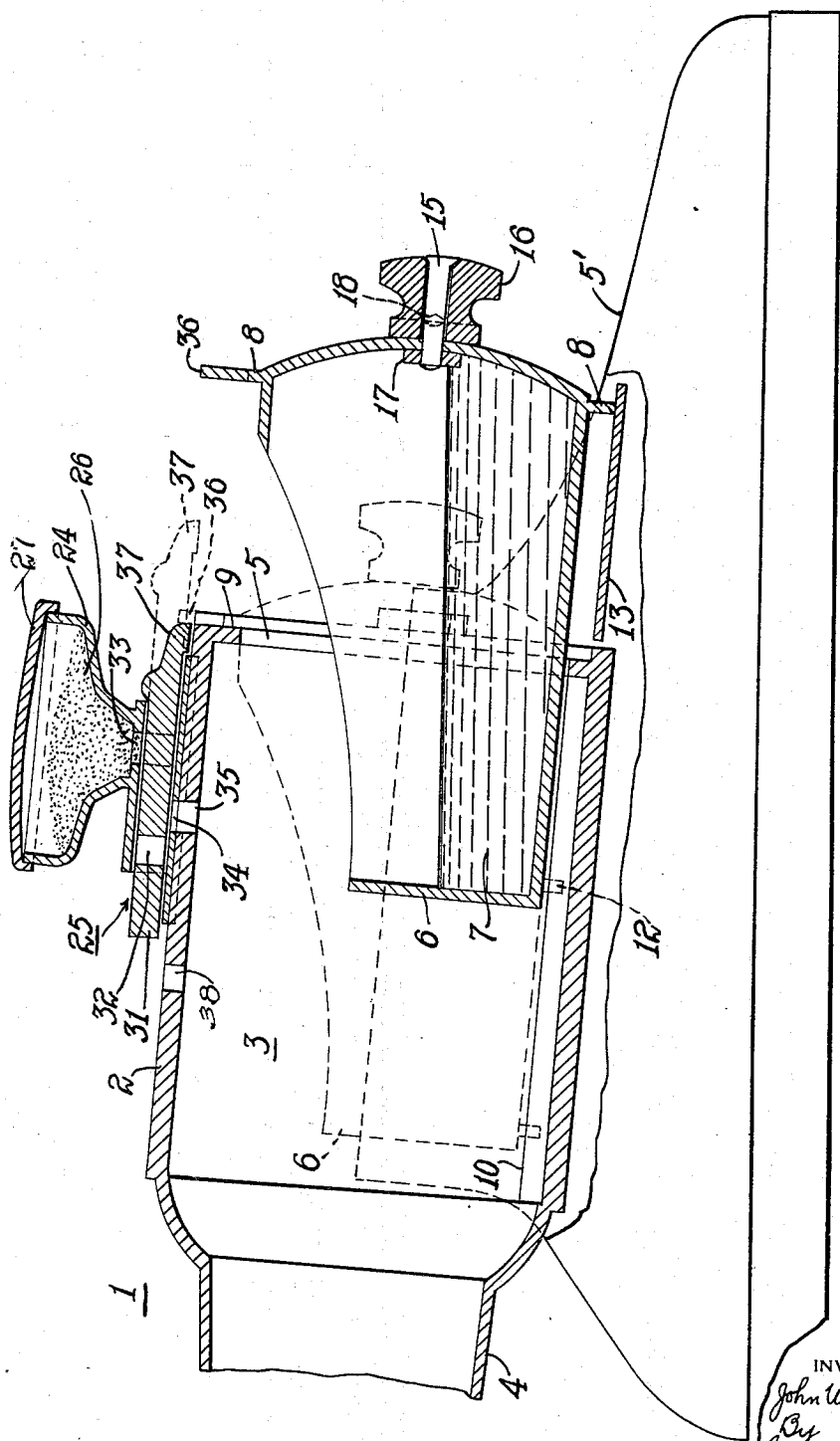


Fig. 1.

INVENTOR
John W. MacDonald
By
Green & McCallister
His Attorneys

June 14, 1932.

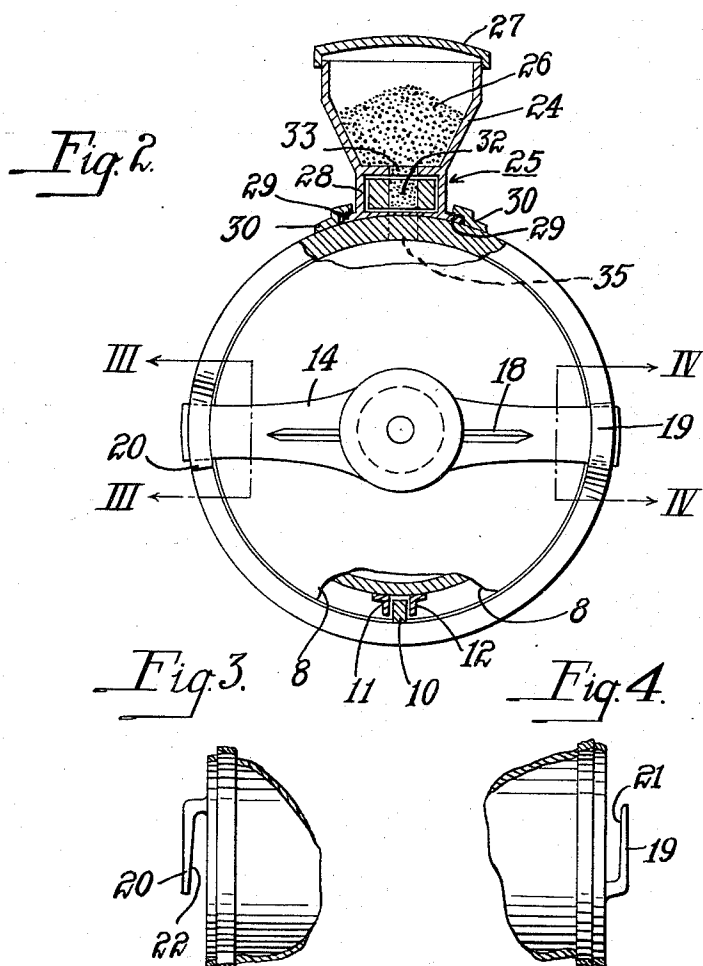
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INVENTOR
John W. MacDonald
By Green & McCallister
His Attorneys

UNITED STATES PATENT OFFICE

JOHN W. MACDONALD, OF WILKINSBURG, PENNSYLVANIA

TOY CANNON

Application filed December 13, 1930. Serial No. 502,062.

This invention relates to toy cannons and more particularly to cannons of the type in which carbide gas may be employed as a means for firing the cannon.

5 An object of this invention is the provision of a simple, inexpensive toy cannon.

Another object of the invention is the provision of a toy cannon that shall remain in operative condition over extended periods of time even though placed in the hands of small boys who may be inclined towards carelessness in respect to the manner of operating the toy and in the details of keeping it in operative condition.

15 Other objects of the invention will, in part, be apparent and will, in part, be obvious from the following description taken in conjunction with the accompanying drawings in which:

20 Figure 1 is a fragmentary view in section taken along the vertical longitudinal axis of a toy cannon arranged and constructed in accordance with the invention;

25 Fig. 2 is a view of the breech end of the cannon proper, partly in section; and

Figs. 3 and 4 are fragmentary views of the cannon taken on lines III—III and IV—IV of Fig. 2.

30 Throughout the drawings and the specification, similar reference characters indicate like parts.

In Fig. 1 of the drawings, a toy cannon 1 is shown, illustrating a simple form of construction embodying the invention. Cannon 1 comprises a barrel 2, having an explosion chamber 3 therein, and a muzzle 4. Barrel 2 is preferably open at its breech as at 5.

35 In a preferred form of construction, the barrel 2 and muzzle 4 may be made either of cast iron or of sheet metal formed as an integral piece or unit.

The barrel and muzzle may be removably mounted on a base 5'.

45 Since the cannon is of the type in which carbide is employed as a means for developing a gas which when mixed with air becomes an explosive mixture, a container or water chamber 6 is provided which is movable into and out of the explosion chamber 3. Chamber 6, when the cannon is in op-

eration, is partially filled with a liquid, such as water, as indicated at 7.

The breech end of the chamber or container 6 carries a marginal circumferential flange 8 that is adapted to register in a circumferential or annular groove 9 formed in the breech end of the barrel 2. In order to prevent turning of the chamber 6, as it is moved into and out of the explosion chamber 3, a rib or flange 10 may be provided on the bottom of the explosion chamber 3, the rib or flange being straddled by angle pieces 11 and 12 secured to the bottom of chamber 6 at its forward end.

55 In order that the rear end of the water chamber or container 6 may be supported when it is withdrawn from the explosion chamber 3, as shown more particularly in Fig. 1, support or base 5' is provided with a shelf or strip 13.

70 When the container or water chamber 6 is moved into explosion chamber 3, as indicated in broken lines in Fig. 1, a measured charge of comminuted carbide or other gas liberating material is deposited in the water or fluid in the container. When in this position, the chamber or container is locked in the position indicated in broken lines in Fig. 1 by means of a bar 14. The bar 14 is pivotally attached to the breech end of the container 6 by means of a pin 15. Pin 15 extends through a knob 16 and the breech end of container 6 is shown in Fig. 1, the pin being peened or riveted at its opposite ends. The inner end of the pin 16 may be peened against a washer or spacer 17 if desired. Knob 16 may be secured to the bar 14 by a pin 18 that lies in a groove in the bar when in place.

80 The bar 14 is held in locking position by catches 19 and 20 formed on the open end of barrel 2 (see Figs. 2, 3 and 4). Catches 19 and 20 have cam surfaces 21 and 22 that operate to force flange 8 of chamber 6 into recess 9 of barrel 2 when bar 14 is turned to its limiting position indicated in Fig. 2.

95 In order that measured quantities of comminuted carbide or other suitable gas liberating material may be delivered to the water chamber 6 when in the position indicated in broken lines of Fig. 1, a magazine or con-

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tainer 24 and a measuring device 25 are provided and mounted on the barrel 2, as shown in Figs. 1 and 2.

Magazine or container 24 carries comminuted carbide 26; and a suitable cover 27 may be employed to protect the carbide from moisture in the air. On the bottom of container 24 is formed a hollow sleeve 28, preferably rectangular in section. The lowermost longitudinal edges of sleeve 28 may be provided with flanges 29 that register in a dovetail groove formed by Z-shape members 30 secured to the top of barrel 2. By this form of construction, chamber 24 and sleeve 28 may be removably mounted on the barrel of the cannon.

The measuring device 25 comprises a slide 31 which is movably or slidably disposed in sleeve 28. Slide 31 is provided with a transverse opening 32, the volume of which is equal to or slightly greater than the volume of the measured quantity of carbide to be transferred into the water chamber. When slide 31 occupies the position indicated in broken lines in Fig. 1, opening 32 registers with an opening 33 in the bottom of container 24 whereby carbide may drop from the container or magazine into the opening 32 and fill it.

In order to transfer the carbide contained in the measuring opening 32 into the water chamber by the operation of shifting the water chamber 6 to the position indicated in broken lines in Fig. 1, in which position the open breach of barrel 2 is closed, chamber 6 is provided with an upwardly extending lug or finger 36 which is disposed to engage or impinge upon end 37 of slide 31. Thus, if water chamber 6 is moved forwardly from the full line position indicated in Fig. 1 to the broken line position, finger or lug 36 will engage end 37 of slide 31 and, when the water chamber is in the position to close the open breach of barrel 2, slide 31 will occupy the full line position indicated in Fig. 1.

As measuring opening 32 passes over the aligned openings 34 and 35, the carbide falls by gravity therethrough into the water in chamber or container 6. When the measured charge of carbide has been deposited in the water thereof, carbide gas is evolved which rises from the water and mixes with the air in the explosion chamber 3, thus forming an explosive mixture of carbide gas and air that may be ignited by introducing a spark or flame into the explosion chamber through touch-hole 38.

When slide 31 is in the position shown in full lines in Fig. 1, opening 32 is out of register with openings 34 and 35, but openings 34 and 35 are covered by the body portion of slide 31, so that communication between measuring opening 32, the source of supply of gas liberating material in magazine 34, and the explosion chamber 3 is sealed or shut

off. The measuring opening 32 and the carbide in magazine 24 being sealed off from the explosion chamber 3, the gases forming in the explosion chamber cannot come in contact with the walls of opening 32 and the carbide in magazine 24 and cause the measuring opening and magazine to become clogged with deposits of carbide or with accumulations of carbide materials transferred from the magazine to the measuring opening.

The nature of carbide is such that it forms deposits on surfaces with which it may come into contact. When the carbide gas mingles with the air in chamber 3 and becomes an explosive mixture, and such mixture is ignited, a substantial pressure is developed in the explosion chamber. Therefore, if slide 31 were not so moved, as explained above, that opening 32 therein is out of register with opening 35 in barrel 2, the gas in chamber 3, being under pressure, would escape into opening 32, along the sleeve and slide, and attack the carbide in the magazine. If such action were allowed to continue for a short period of time, the moisture in the gas would cause encrustations to form in the sleeve, and the openings or passages in the magazine, slide, and barrel 2. Such chemical reaction being cumulative, the above mentioned openings or passages would ultimately be clogged or closed and rendered inoperative.

Another characteristic of carbide is, that after it has been acted upon by water and transformed into a gas, the gas tends to return to its original state, that is, it solidifies and becomes cement hard. Also the deposits formed in the bottom of the water chamber 6, if not removed, ultimately solidify and become cement hard. It is therefore important that the parts hereinbefore mentioned, and particularly the chamber 6, be made removable so that any solidified deposits of carbide may be removed therefrom.

After the cannon has been fired, in the manner explained hereinbefore, water chamber 6 is moved rearwardly to the position shown in full lines in Fig. 1. Slide 31 may now be pulled rearwardly to the position indicated in broken lines in Fig. 1, in which position opening 32 and 33 coincide, permitting carbide to fill the measuring opening 32. Slide 31 and chamber 6 are then pushed forward, as before, until the carbide is discharged by gravity through opening 34 into the water chamber, and the water chamber moved into the explosion chamber and locked in position as aforesaid. The cannon is now again in condition for firing.

The cannon may thus be fired as often as desired.

Since water chamber 6 is moved into and out of the chamber after each firing and charging operation, the explosion chamber is ventilated so that a fresh charge of air is always available to produce an explosive mix-

ture each time a charge of carbide is deposited in the water chamber. Also, since the chamber is moved into and out of the chamber 3, the water therein is agitated whereby substantially complete reaction of the carbide with the water is insured. The water being agitated in this manner, the residue of the carbide tends to be distributed evenly over the bottom of chamber 6, preventing a piling or mounting up of the carbide residuum at the point or in the region where the carbide is deposited from the measuring device.

It will be apparent, that since the barrel 2 is open at the breech end, and the water chamber is removable therefrom, the water chamber and the explosion chamber may conveniently and thoroughly be cleansed of all deposits occasioned by contact of the surfaces of the cannon exposed to the carbide gases.

The measuring device and magazine being removable from the cannon and dismantlable, they may be thoroughly cleansed when necessary.

The form of cannon shown and described herein, is simple in construction, may be manufactured at a low cost, and being composed of relatively few accessible parts, it may be placed in the hands of small boys and youths with the assurance that it will be operative and remain operative for an indefinite length of time.

While only one form of the invention has been shown and described, it is to be understood that it is merely illustrative of what may now be considered a preferred embodiment of the invention. It is, therefore, desired that only such limitations shall be placed on the invention as are imposed by the prior art and appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. A toy cannon having an explosion chamber and an independent water chamber movable into and out of said explosion chamber, said chamber being arranged to receive comminuted gaseous material which, upon reacting with the water, liberates gases, said gases upon rising and mixing with the air in the explosion chamber, forming an explosive mixture.

2. A toy cannon having an explosion chamber open at one end, and an independent water container movable into and out of said chamber through said open end, said container having a portion arranged to register with the open end of the explosion chamber to seal off communication between the atmosphere and the explosion chamber, when the container is in operative position therein.

3. A toy cannon having an explosion chamber open at one end, and an independent water container movable into and out of said chamber through said open end, said container having a portion arranged to register with the open end of the explosion chamber

to seal off communication between the atmosphere and the explosion chamber, when the container is in operative position therein, and means to lock said container to the cannon.

4. A toy cannon having an explosion chamber, a water chamber disposed within the explosion chamber and being removable therefrom as a unit.

5. A toy cannon having an explosion chamber open at its breech, and a removable water container disposed in said chamber and when in place closing said open breech.

6. A toy cannon having an explosion chamber open at its breech, a cover closing said breech and a water chamber forming a part of said cover, said water chamber being disposed within said explosion chamber when in gas forming position and adapted for movement into and out of the same.

7. A toy cannon having an explosion chamber, a water chamber therein, a source of gas liberating material disposed on the cannon, and a measuring device having a measuring part for transferring measured quantities of said material to the water chamber, said measuring device when in one position sealing off communication between the explosion chamber and the measuring part thereof.

8. A toy cannon having an explosion chamber, a water chamber therein, a source of gas liberating material disposed on the cannon, and a measuring device having a measuring part for transferring measured quantities of said material to the water chamber, said measuring device when in one position sealing off communication between the explosion chamber and the measuring part thereof and between the explosion chamber and said source of gas liberating material.

9. A toy cannon having an explosion chamber with an open breech, a magazine for gas liberating material disposed on the cannon, a water container removably arranged in said explosion chamber and communicating with said magazine, said container when in one position closing said open breech, and means closing off communication between said explosion chamber and magazine in the operation of closing said breech.

In testimony whereof, I have hereunto subscribed my name this 11th day of December, 1930.

JOHN W. MACDONALD.