

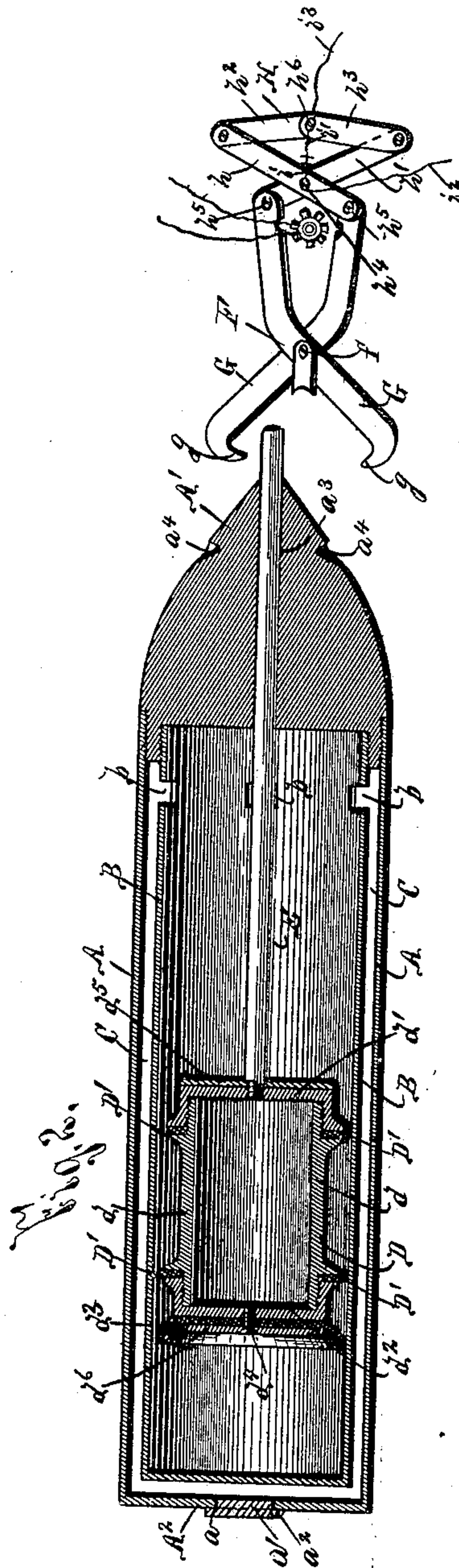
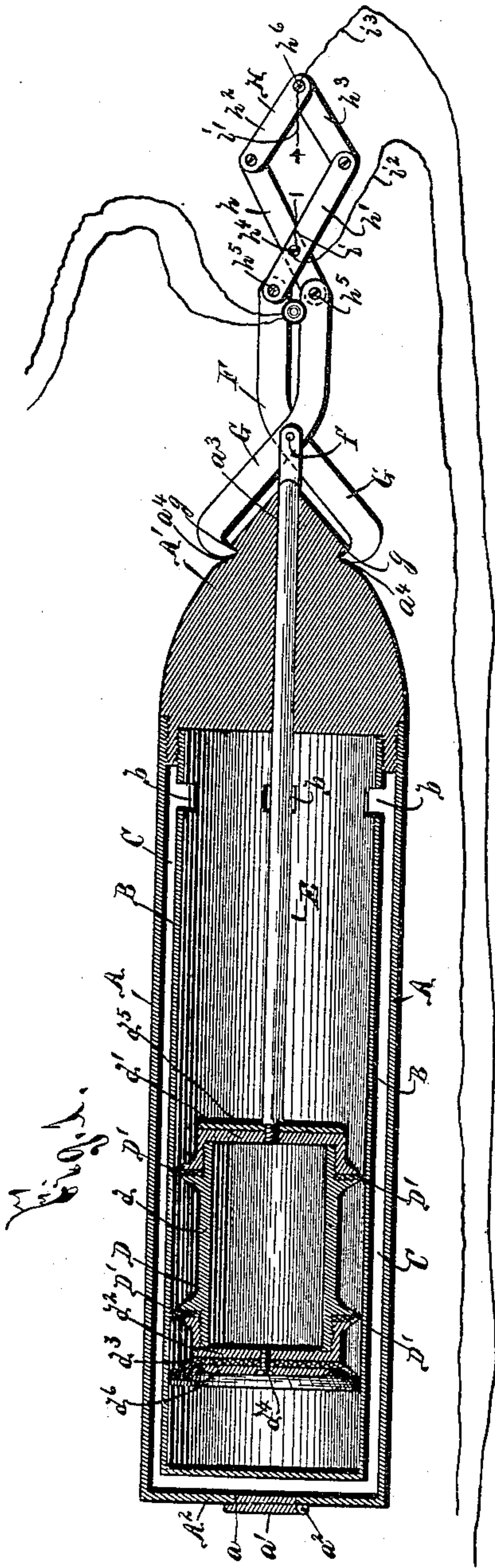
(No Model.)

2 Sheets—Sheet 1.

M. F. WALKER.  
CARTRIDGE.

No. 458,026.

Patented Aug. 18, 1891.



WITNESSES:  
H. Chase,  
W. H. Randall,

INVENTOR  
Moses F. Walker  
BY  
Hoy Wilkins  
ATTORNEYS



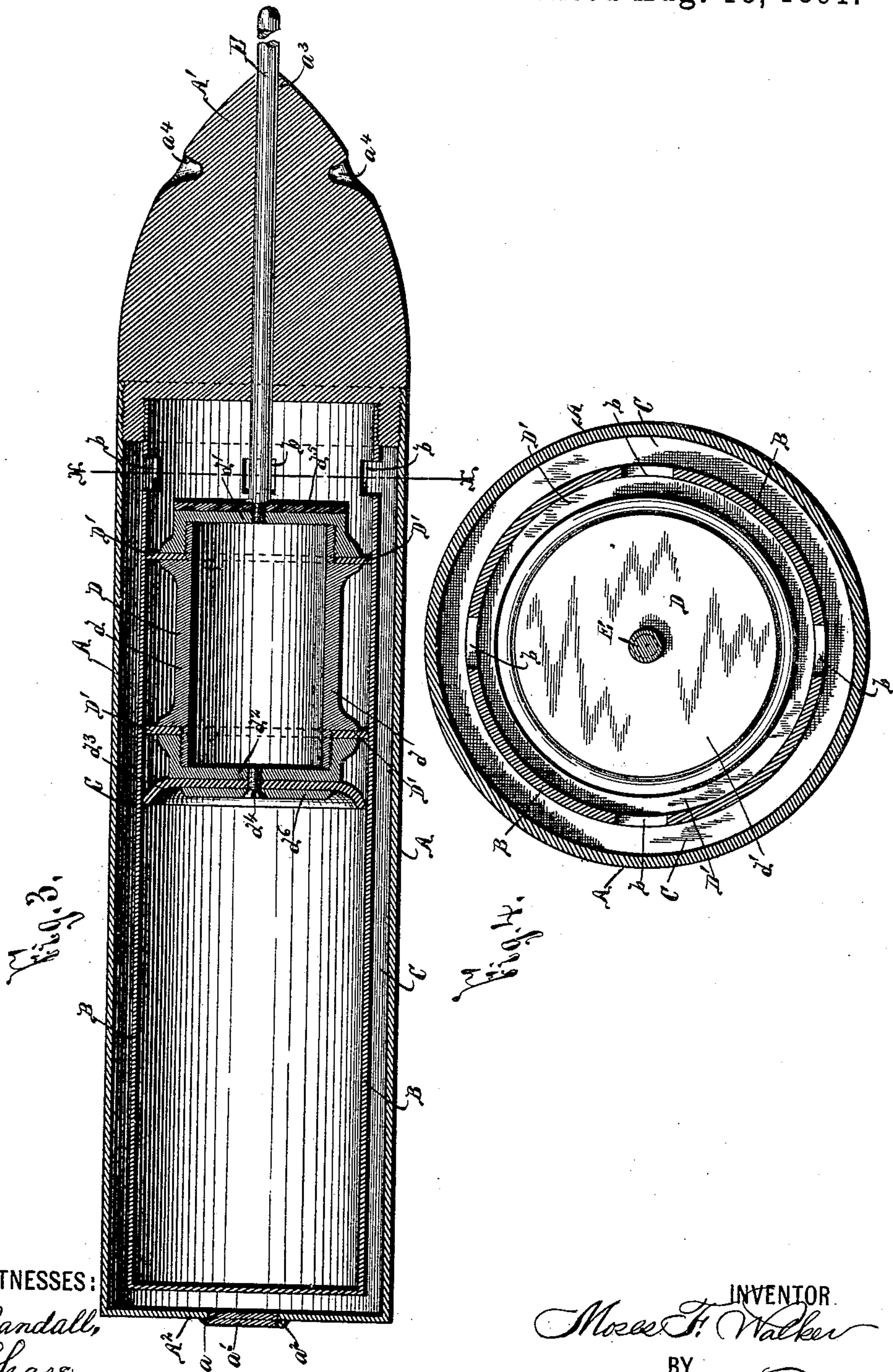
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*W. H. Randall,*  
*H. C. Chase*

INVENTOR.

*Moses F. Walker*

BY

*Hay William Payne*  
ATTORNEYS



# UNITED STATES PATENT OFFICE.

MOSES F. WALKER, OF SYRACUSE, NEW YORK, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF TWO-THIRDS TO JOHN C. BOWE AND HEY, WILKINSON & PARSONS, ALL OF SAME PLACE.

## CARTRIDGE.

SPECIFICATION forming part of Letters Patent No. 458,026, dated August 18, 1891.

Application filed January 13, 1891. Serial No. 377,607. (No model.)

*To all whom it may concern:*

Be it known that I, MOSES F. WALKER, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Cartridges, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to a dynamite cartridge of simple and effective construction which may be readily and easily fired from a cannon or other fire-arm without the slightest liability of danger to the operator or the fire-arm and with absolute certainty of explosion upon the desired contact with a target or obstruction.

To this end the invention consists, essentially, in an outer shell, a movable carrier within the outer shell, means at one end of said shell for forcing the carrier toward the opposite end, and a rod extending through the shell for discharging the dynamite or other explosive upon contact of the cartridge.

The invention furthermore consists in a vacuum-chamber at the front and a compressed-air chamber at the rear of the explosive-carrier, a lock for engaging the movable rod and holding the carrier against the action of the compressed air, firing mechanism for disengaging the lock from the rod to permit the action of the compressed air, and firing mechanism for bringing into action the projecting force for the cartridge after the action of the compressed air.

The invention still furthermore consists in the detail construction and arrangement of the parts, all as hereinafter more particularly described, and pointed out in the claims.

In describing this invention reference is had to the accompanying drawings, forming a part of this specification, in which like letters indicate corresponding parts in all the views.

Figure 1 is a longitudinal view of the normally-loaded cartridge. Fig. 2 is a longitudinal sectional view showing the carrier of the cartridge as having started and the firing mechanism for bringing into action the projecting force of the cartridge as just on the point of operation. Fig. 3 is an enlarged lon-

gitudinal sectional view of the cartridge in its position assumed upon contact with a target or obstruction, and Fig. 4 is a horizontal sectional view taken on line *x x*, Fig. 3.

It is well known that there is a great demand for a cartridge or projectile which will carry dynamite or other explosive without the slightest injury to the cannon or fire-arm from which the cartridge is propelled and force it with accuracy against a suitable target or obstruction with absolute certainty of explosion of the dynamite when the target is reached. A serious objection to cartridges of this character has been that the force which projects the cartridge is extremely liable to explode the dynamite, or, if such force does not explode the dynamite, then contact with the target is equally inefficient to produce such explosion. My invention is designed to obviate these difficulties and effect great certainty of operation, these desirable results being effected by starting the dynamite-carrier within a chamber in the cartridge-shell before the cartridge commences its movement occasioned by the explosion of the powder or other explosive force used and by securing to the explosive-carrier a rod, which projects through and beyond the cartridge-shell during transit and first encounters the target or obstruction, whereupon it is forced into and explodes the dynamite.

A represents the outer shell, which is formed of any suitable material possessing the desired rigidity, strength, and lightness, being preferably formed of cast-steel. Within the outer shell A is the inner shell B, also composed of suitable material and formed of less cross-sectional area or diameter than the outer shell A, whereby the air-chamber C is interposed between said shells A and B.

The front end A' of the cartridge is pointed for the purpose of insuring easy passage, and forms the top wall of both outer and inner shells A and B. At the rear end A<sup>2</sup> of the outer shell is the opening *a*, which leads into the chamber C, and is normally closed by a movable door *a'*, preferably hinged at one extremity at *a*<sup>2</sup>, with its opposite extremity free to open or close. At the top of the inner shell B is one or more openings *b*, through



which the air passes through the inner shell to the cavity C when the door or valve  $a'$  is open and the air is being exhausted from the chamber C by any suitable construction of vacuum-producing apparatus.

D represents the explosive-carrier, which, although it may be of any desirable form and construction, is preferably, for the sake of convenience, composed of the cylindrical side wall  $d$  and the removable front and end walls  $d'$  and  $d^2$ .

The carrier-shell D is of less cross-sectional area than the inner shell B, and is supported by yielding supports or rings  $D'$  at its opposite ends, which ride against the inner periphery of the shell B. It will be noted that between the rear walls of the carrier and inner shells is formed a closed air-chamber, and that as the carrier-shell is depressed the pressure of the air within the chamber is correspondingly increased, whereupon, when the force is released for depressing the carrier-shell or holding it in its depressed position, the compressed air immediately forces it forward within the inner shell B. To render more positive the retention of the compressed air, I provide the yielding plate  $d^3$ , secured by a screw  $d^4$  to the rear end of the carrier-shell, and to obviate all liability of injury or battering of the parts I provide at the opposite ends of the carrier-shell yielding buffer-plates  $d^5$  and  $d^6$ .

For the purpose of depressing the carrier-shell and holding it in its depressed position, and also for the purpose of absolutely insuring the explosion of the contained explosive, I provide a rod E, having one extremity secured to the carrier-shell and the other guided through an opening  $a^3$  in the front end of the cartridge. This rod is held in its adjusted position by a suitable lock F, which engages its front extremity. As preferably constructed the lock consists of a lever hinged at  $f$  to a pair of levers G G, having their rear extremities provided with shoulders  $g$ , which engage seats or recesses  $a^4$  in the front end of the cartridge. Between these levers is an explosive or other firing mechanism that is connected to the opposite poles of an electric circuit for forcing said levers apart when the circuit is open, and thus separating the lower extremities of the levers G and permitting the forward movement of the rod E, as the compressed air forces the carrier to the forward end of the cartridge. Immediately upon the commencement of the forward movement of the carrier I design to fire or bring into action the explosive force for the cartridge or projectile. This desired result may of course be attained by any suitable construction of firing mechanism; but I have here illustrated, as particularly applicable for carrying out the desired result, the firing mechanism H, which consists of four levers  $h$ ,  $h'$ ,  $h^2$ , and  $h^3$ , the first two being pivoted together at  $h^4$  and pivoted at their rear extremities at  $h^5$  to the front extremities of the

levers G G. The latter two are pivoted at their rear extremities to the front extremities of the former two, and are pivoted together at  $h^6$ . Supported upon the opposite pairs of levers are the opposite poles  $i i'$  of an electric circuit, which is connected to the powder or other explosive of the cannon or gun, as is common in electric fusing. Now it will be understood from the construction of the locking and firing device that the operator fires the cap or other explosive between the arms G G, here shown by means of an electric circuit, which causes the separation of said arms and disengages the lock from the carrier-rod and at the same time brings the poles  $i i'$  in contact, and consequently closes the other electric circuit to the primer of the cannon and produces the usual explosion and consequent projection of the cartridge immediately after the lock has been disengaged and the carrier and its rod have begun their forward movement.

The operation of my invention will be readily perceived from the foregoing description and upon reference to the drawings, and it is evident that its parts are simple in construction, that owing to the independent movement of the explosive-carrier and the cartridge-shell the obviation of shock to the carrier from the action of the cartridge-actuating force is absolutely prevented, and that the explosion of the dynamite when the target or obstruction is reached is absolutely certain.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The herein-described cartridge, the same comprising an outer shell, a movable explosive-carrier within the outer shell, and a rod extending from the carrier through the outer shell and provided with a lock at its outer extremity, substantially as and for the purpose set forth.

2. The herein-described cartridge, the same comprising an outer shell, a movable carrier within the outer shell, means at one end of said shell for forcing the carrier toward the opposite end, a rod extending from the carrier through the outer shell, and a lock for engaging said rod and holding the carrier against the action of said moving means, substantially as and for the purpose specified.

3. The herein-described cartridge, the same comprising an outer shell, a movable carrier within the outer shell, means at one end of said shell for forcing the carrier toward the opposite end, a rod extending from the carrier through the outer shell, a lock for engaging said rod and holding the carrier against the action of said moving means, and an explosive for disengaging said lock and rod to permit the action of the carrier-moving means, substantially as and for the purpose specified.

4. The herein-described cartridge, the same comprising an outer shell, a movable carrier



within the outer shell, means at one end of said shell for forcing the carrier toward the opposite end, a rod extending from the carrier through the outer shell, a lock for engaging said rod and holding the carrier against the action of said moving means, an explosive for disengaging said lock and rod to permit the action of the carrier-moving means, and a firing mechanism connected to bring the cartridge-projecting force into action after the release of said rod, substantially as and for the purpose set forth.

5. The herein-described cartridge, the same comprising an outer shell, a movable carrier within the shell, an exhaust-air chamber in front of and a compressed-air chamber in the rear of the carrier, a rod extending from the carrier through the outer shell, and a lock for engaging said rod and holding the carrier against the action of said moving means, substantially as and for the purpose set forth.

6. The herein-described cartridge, the same comprising an outer shell, a movable carrier within the shell, a vacuum-chamber, and a compressed-air chamber above and below the carrier, a rod extending from the carrier through the outer shell, a lock for engaging said rod and holding the carrier against the action of said moving means, an explosive for disengaging said lock and rod to permit movement of the carrier, and a firing mechanism connected to bring the cartridge-projecting force into action after the release of said rod, substantially as and for the purpose specified.

7. In a cartridge, the combination of an outer shell having a normally-closed opening, an inner shell having an opening to permit the passage of the air from the inner to the outer shell, a closed carrier-shell movable beneath the opening in the inner shell, an opening in the front end of the outer shell, and a rod secured to the carrier and movable through the front opening, substantially as and for the purpose set forth.

8. In a cartridge, the combination of an outer shell having a normally-closed opening, an inner shell having an opening to permit the passage of the air from the inner to the outer shell, a closed carrier-shell movable beneath the opening in the inner shell, an opening in the front end of the outer shell, a rod secured to the carrier and movable through the front opening, seats on the outer shell, supports mounted in said seats, and a stop on said supports for engaging the outer end of said rod, substantially as and for the purpose specified.

9. In a cartridge, the combination of an outer shell having a normally-closed opening, an in-

ner shell having an opening to permit the passage of the air from the inner to the outer shell, a closed carrier-shell movable beneath the opening in the inner shell, an opening in the front end of the outer shell, a rod secured to the carrier and movable through the front opening, seats on the outer shell, pivoted levers having one end engaging said seats and the other end adapted to carry an explosive for separating said levers, and a stop on said supports for engaging the outer end of said rod, substantially as and for the purpose specified.

10. In a cartridge, the combination of an outer shell having a normally-closed opening, an inner shell having an opening to permit the passage of the air from the inner to the outer shell, a closed carrier-shell movable beneath the opening in the inner shell, an opening in the front end of the outer shell, a rod secured to the carrier and movable through the front opening, seats on the outer shell, pivoted levers having one end engaging said seats and the other adapted to carry an explosive for separating said levers, a stop on said levers for engaging the outer end of said rod, levers connected to the former levers, and opposite poles of an electric circuit mounted on said latter levers, substantially as and for the purpose set forth.

11. In a cartridge, the combination of an outer shell, an inner shell, a closed carrier movable within the inner shell and formed of less cross-sectional area than the inner shell, yielding supports between the carrier and inner shell, and a rod extending from the carrier through the outer shell, and a lock for engaging the outer end of said rod, substantially as and for the purpose set forth.

12. In a cartridge, the combination of an outer shell having a normally-closed opening, an inner shell having an opening to permit the passage of the air from the inner to the outer shell, a closed carrier-shell movable beneath the opening in the inner shell, said carrier being of less cross-sectional area than the inner shell, yielding supports between the carrier and inner shell, and a rod extending from the carrier through the outer shell, substantially as and for the purpose specified.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 7th day of January, 1891.

MOSES F. WALKER.

Witnesses:

CLARK H. NORTON,  
L. M. BAXTER.