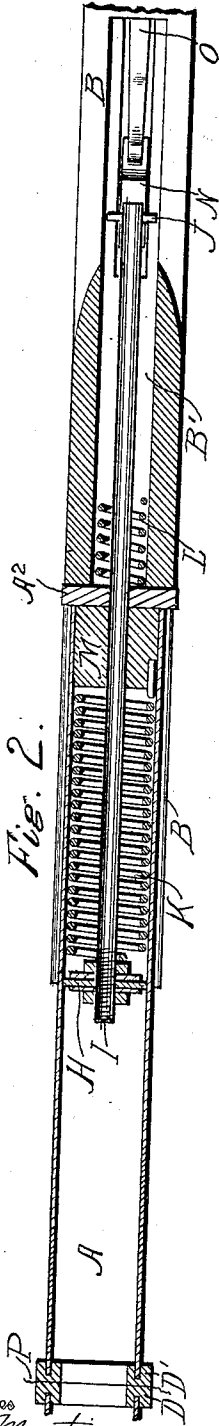


J. E. BIRDSALL.
TOY GUN.

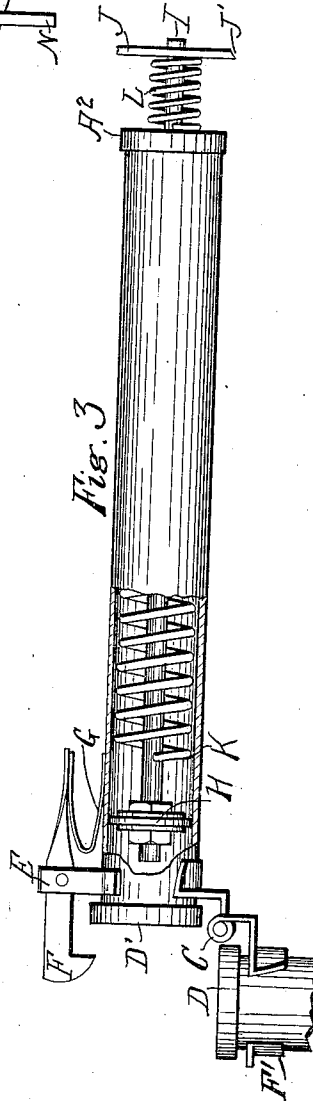
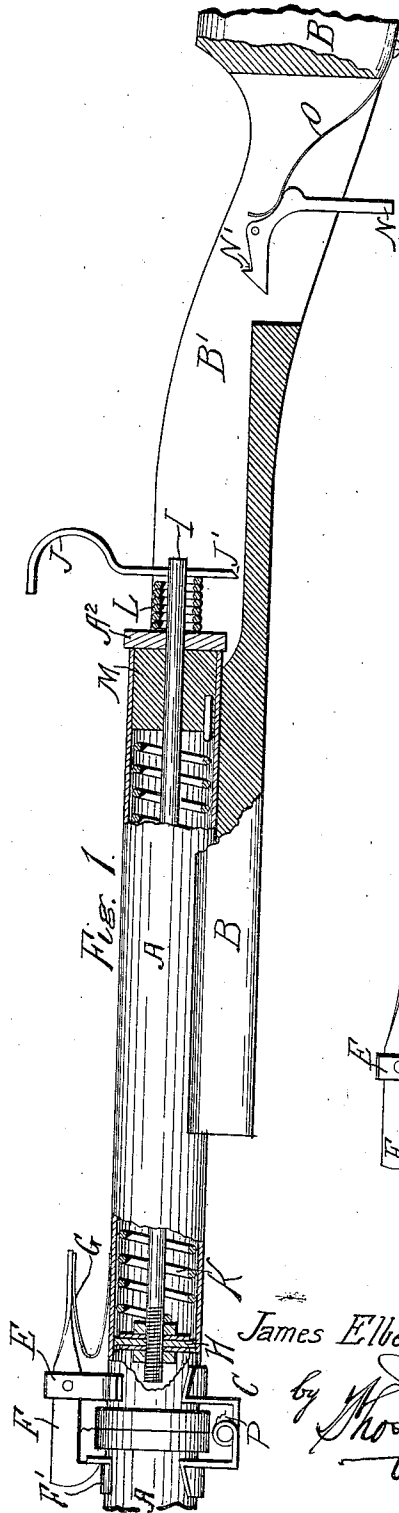
APPLICATION FILED MAY 23, 1912.

Patented May 6, 1913.

1,060,887.



Witnesses
L. S. Martin.
H. N. Warner.



James Elbert Birdsall Inventor

by *Wm. J. Martin*

Attorney

UNITED STATES PATENT OFFICE.

JAMES ELBERT BIRDSALL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
WORTHINGTON E. DOTTS, OF PHILADELPHIA, PENNSYLVANIA.

TOY GUN.

1,060,887.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES ELBERT BIRDSALL, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Toy Gun, of which the following is a specification.

My invention relates to a new method of exploding a paper or similar membrane by compressed air pressure and accompanying the explosion and report by a puff of artificial smoke, and the object thereof is to produce a sharp and loud report and a cloud of powder resembling smoke at the same time. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation with the stock and muzzle partly broken off, and part of the barrel and stock broken away to show interior in section, Fig. 2 is a horizontal section through the center of the barrel showing position of the parts when the gun is set for firing, Fig. 3 is a side elevation of the barrel with stock removed and parts broken away to show position of parts after the trigger has been pulled and before the explosion.

Similar letters refer to similar parts throughout the several views.

The barrel is composed of two sections, A and A¹, adapted to be separated and brought together in true alinement. In the form shown the part A is fastened to the stock, B, and part A¹ is hinged to part A at C. The adjacent and abutting ends of these two elements of the barrel have one or two gaskets of rubber, leather or other compressible material interposed. I show in the drawing two gaskets, D and D¹, one for each part of the barrel. The object is to construct an air tight clamp to hold a sheet, P, of prepared paper or other fragile film over the open end of the part A, which film is to be burst when the gun is fired. To maintain this form of clamp in contact, a keeper F is pivoted to a standard, E, extending from the part A, and, by the pressure of the spring, G, is held over the lug, F¹, on the part A¹.

Within part A is the reciprocating piston H, centered upon and fast to the rod I which extends from the forward end of part A, through the same, passing out through the head and guide piece, A², and projecting

into a recess, B¹, hollowed out of the stock, B. To this projecting end of this rod, I, is affixed the rigid upstanding hammer, J, adapted to be hooked by the finger of the user and retracted so that the lower end, J¹, will pass behind and engage within the notch, N¹, in the bell crank trigger N, which is pivoted to the stock and held, by the action of the spring, O, in such position that the notch N¹ is normally in the path of the lower end, J¹, of the hammer.

As the object of my invention is to produce a very violent discharge in the most sudden manner, so as to cause a loud, sharp report, and to dislodge and eject a puff of powder to simulate smoke, I have devised the following construction in the actuating mechanism, so as to compress a quantity of air first, and then to jar it into an explosion. On the rod, I, is loosely centered a cylindrical member, M, free to ride longitudinally within the part A, along said rod, except as it may be controlled by the action of the spiral spring, K. This spring K is fastened to the member, M, and is coiled within the part A, in a helix about the rod, I, but is not in any manner attached to the piston, H, against which it normally bears. It is slightly longer than the greatest distance between the piston, H, and the head piece, A², when uncompressed, and is of such power that, the piston being retracted, when released it will repulse said piston against the air in the forward length of barrel A, so that the piston instantly jumps in advance of the spring. This effects a partial compression of air within the part A, between the piston, H, and the film, P. On the rod, I, is interposed, between the hammer, J, and the head, A², the helical cushion spring, L. When the piston, H, has accumulated a charge of compressed air within the barrel A, the combined action of such charge and the spring, L, result in checking the forward impulse of the piston, H, so that the spring, K, catches up to the piston with a sharp impact and adds the final touch of pressure necessary to burst the film with great violence and loud report. The cylindrical member, M, being loosely positioned, except as restrained by spring, K, is free to add to this final impact by momentum, any force generated by its rebound from the wall, A², as well as any force transmitted through the spring, L, and head, A², by the blow of

the hammer, J, upon the spring, L. The result of this combination of parts is to accumulate a charge of compressed air almost sufficient to burst the film, and to instantly thereafter administer a final sudden blow to the charge while at its highest tension, which produces the desired effects. As I also enhance the illusion of a "real gun" by producing artificial smoke, it is necessary to prepare the paper or other material, by coating the same with an impalpable powder susceptible of being dislodged by the shock of the discharge and forcibly expelled by the resultant air blast from the muzzle.

For the purpose of illustrating my invention, I have shown in the accompanying drawings the form thereof which is at present preferred by me, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized, and that my invention is not to be limited to the precise arrangement and organization as shown and described and I reserve the right to reorganize and rearrange these instrumentalities within the scope of my invention.

Having thus explained the nature of my invention and described and shown a way of constructing the same, although without attempting to set forth all the forms in which it may be made or all the modes of its use, what I do claim is:

1. In a toy gun, in combination, a two piece barrel, a rod in said barrel, a piston fixed to said rod, a plug freely centered on said rod, a helical spring about said rod and attached to said plug, a cushion spring about said rod, a shoulder on said rod adapted to be engaged by said spring, a fixed guide piece adapted to steady said rod between said plug and said cushion spring.

2. In a toy gun, in combination, a two piece barrel adapted to be separated and re-joined, a rod in said barrel, a piston fixed on said rod, a longitudinally movable plug centered on said rod, a helical spring attached to said plug and normally extending to and touching said piston, a guide piece adapted to guide said rod and to limit the

play of said plug, a hammer on said rod, a cushion spring about said rod between said guide piece and said hammer.

3. In a toy gun, in combination, a two-part barrel, one or more compressible gaskets interposed between said two parts, a powder coated film, means for separating and rejoining said parts so as to permit of the insertion and securing of said film between the same, a rod within said barrel, a piston fixed on said rod, a longitudinally movable member freely centered on said rod, a helical expansion spring between said piston and said member attached to said member, means for retracting said piston and rod and for holding and releasing same, substantially as described.

4. In a toy gun, the combination of a barrel, a powder-shedding film fixed across said barrel adjacent to one end, a head at the other end of said barrel, a rod penetrating said head and extending within said barrel, a stop at the outer end of said rod, a piston fixed at the inner end thereof, a longitudinally movable element within said barrel, a helical spring attached to said movable element and normally touching said piston, means for retracting, holding and releasing said rod substantially as described.

5. In a toy gun, in combination, a barrel provided with a film holder, a film therein, an air compression piston in said barrel, means to actuate said piston and means to jolt said piston at time of highest air compression.

6. In a toy gun, in combination, a barrel provided with a film holder, a dust shedding film therein, an air compression piston in said barrel, means to actuate same, a movable plug behind said piston, adapted to impart a shock thereto at time of highest air compression, means to actuate said plug.

In witness whereof I have hereunto signed my name in the presence of two witnesses.

JAMES ELBERT BIRDSALL.

Witnesses:

M. M. HAMILTON,
L. I. MARTIN.