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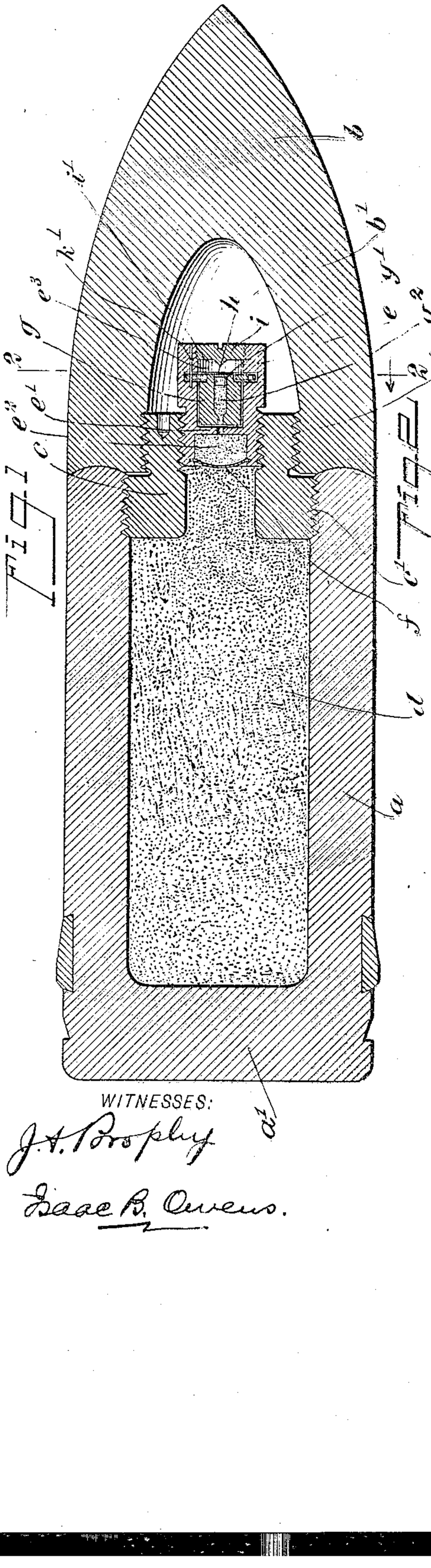
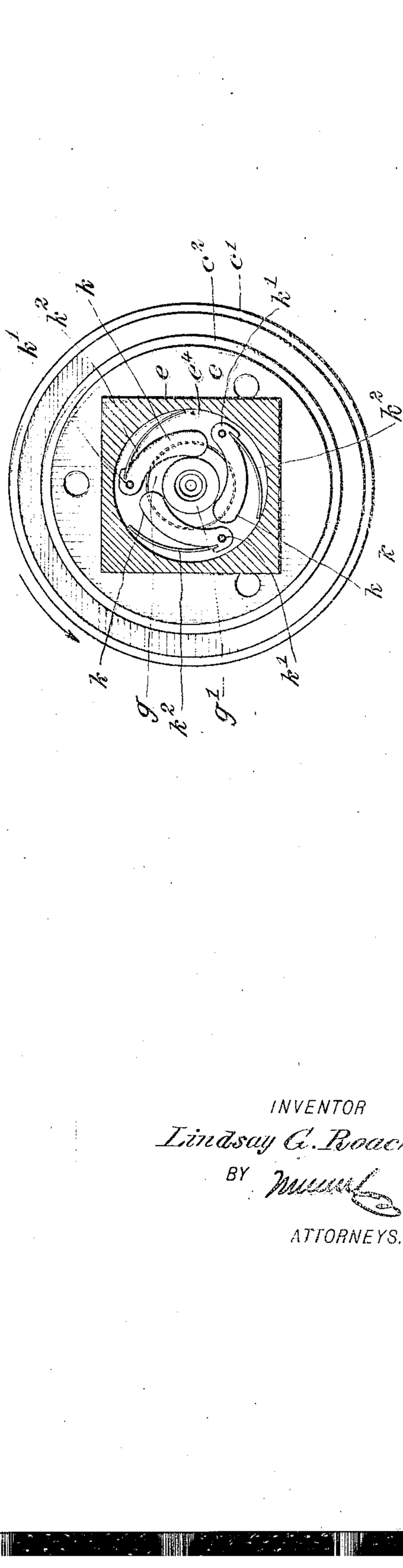
L. G. ROACH.

SHELL.

APPLICATION FILED AUG. 26, 1902.

NO MODEL.





WITNESSES:

J. A. Brophy

Isaac B. Owens.

INVENTOR

Lindsay G. Roach

BY Munn & Co

ATTORNEYS.

No. 737,964. Patented September 1, 1903.

UNITED STATES PATENT OFFICE.

LINDSAY GORDON ROACH, OF FREDERICKSBURG, VIRGINIA.

SHELL.

SPECIFICATION forming part of Letters Patent No. 737,964, dated September 1, 1903.

Application filed August 26, 1902. Serial No. 121,028. (No model.)

To all whom it may concern:

Be it known that I, LINDSAY GORDON ROACH, a citizen of the United States, and a resident of Fredericksburg, in the county of Spottsylvania and State of Virginia, have invented a new and Improved Shell, of which the following is a full, clear, and exact description.

This invention relates to an improvement in explosive shells or projectiles used in the art of gunnery. The prime feature of the invention lies in the combination of an exploding means and a centrifugally-releasable restraining device for the exploding means. This restraining device is normally active; but when the projectile begins its rotating flight the centrifugal force attending such rotation renders the restraining device inoperative, and then as the shell or projectile strikes the target the exploding device is operated by the impact of the blow. The invention also involves various minor features of construction by which the production of the shell is decreased in cost, while at the same time its efficiency in many points is increased.

This specification is an exact description of one form of my invention, while the claims define the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both views.

Figure 1 is a longitudinal section of the invention, and Fig. 2 is an enlarged sectional view showing the joint-ring and the restraining means looking from the line 2 2 of Fig. 1.

a indicates the body of the shell, which is made, preferably, of cast-iron and formed with an integral base or rear end *a'*, thus insuring absolute tightness at this point and preventing the gases in the gun from entering the shell and effecting the exploding charge thereof.

b indicates the point of the shell. This is preferably formed of hardened steel, so as to be armor-piercing, and it is connected with the body *a* by means of a joint-collar *c*, which comprises an enlarged part *c'*, screwing into the forward end of the body *a*, and a reduced part *c²*, on which the point or nose *b* is screwed. This joint collar or ring is also preferably formed of cast-iron.

The bursting charge of the shell is placed in the body *a*, as indicated at *d*. Now it will be seen that by forming the nose of the shell of hardened steel or its equivalent an armor-piercing structure is provided, and by forming the body *a* of cast-iron or like metal the bursting capacity is increased, while at the same time the expense of producing the shell is very much lessened.

Screwed into and closing the joint-ring *c* is a case *e*, which projects forwardly into a cavity *b'*, formed in the point *b*. This case *e* is divided by a perforated partition *e'* into a rear chamber *e²* and a forward chamber *e³*. The rear chamber *e²* forms a magazine for carrying a charge of quick-burning powder which is employed to ignite the main charge *d*.

f indicates a closure of thin sheet-copper or the like which holds the charge in the magazine-chamber *e²*, but which is readily fracturable when said charge is exploded. Fitted to be longitudinally movable in the front chamber *e³* of the case *e* is the firing-plunger *g*. This plunger is formed with a reduced forward portion *g'*, adapted to contain a percussion-cap *h*, and from this reduced portion *g'* a passage *g²* extends rearward longitudinally through the plunger and serves to carry a charge of quick-burning powder, the same as the magazine *e²*.

i indicates a disk which is fastened in the front end of the chamber *e* and is formed with an anvil or firing-point *i'* on its interior face. This disk *i* not only closes the front end of the chamber *e*, but also holds the firing-point or anvil *i'* in position to be struck by the cap *h* as the plunger *g* moves forward.

k indicates a number of dogs, which are pivoted at the points *k'*, (see Fig. 2,) such points being at one end of the dogs and the dogs being mounted in cavities *e'*, formed in the case *e*.

k² indicates springs which hold the dogs *k* normally in the position shown in Figs. 1 and 2, in which position said dogs lie against the reduced front part *g'* of the firing-plunger *g*, and thus keep the firing-plunger in its rearward position, preventing its movement forwardly to strike the cap *h* against the anvil or firing-point *i'*. When, however, the rotary movement of the shell begins the dogs *k* are thrown out by centrifugal force and lie wholly within the cavity *e'*, thus disengaging the plunger *g* and permitting said plunger to

move forwardly and strike its cap against the firing-cap i'.

In the use of the invention the parts are assembled as shown in Fig. 1, and when the shell is fired through a rifled gun its rotary movement will cause the dogs k to move into inactive position. Said dogs will be held in inactive position by the continued rotary movement of the shell. This releases the firing-plunger and leaves it free to strike the point i'. When, therefore, the projectile hits its mark, the impact of the blow will cause the firing-plunger to move forward rapidly and strike the cap h against the firing-point or anvil i'. This explodes the cap and the flame thereof is communicated through the medium of the powder in the passage g^2 and magazine e^2 to the main or bursting charge d, and the shell is thereupon exploded. The bursting effect of the shell is very much increased by constructing the body a of cast metal, as explained, while the penetrating effect of the shell is rendered the same as in the best forged-steel projectiles, owing to the arrangement of the nose b of hardened steel or equivalent material.

Various changes in the form and details of my invention may be resorted to at will without departing from the spirit of my invention. Hence I consider myself entitled to all forms of the invention as may lie within the intent of my claims.

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

1. A shell, comprising a body of relatively friable material, a point or nose of a relatively hardened material, a joint-ring connecting the body and point or nose, a case secured to the joint-ring and projecting into the point or nose, said case being provided with an apertured partition dividing it into two communicating compartments, the inner compartment forming a powder-chamber closed by a readily-fracturable cover and the outer one by a disk having an anvil or firing-point on its inner face, a firing-plunger in the outer compartment of the case, said plunger having a central bore for containing powder and a reduced outer end carrying a percussion-cap, and pivoted and spring-pressed dogs mounted in cavities of the case and normally engaging the shoulder formed by the reduced end of the firing-plunger, as set forth.

2. A shell, comprising a body formed of two members, and a ring detachably connecting the members, a case secured to the said ring and projecting into the point or nose, said case being provided with an apertured partition dividing it into two communicating compartments, the inner compartment having its inner end closed by a readily-fracturable material and the outer one by a closure having a firing-point on its inner face, a firing-plunger in the outer compartment of the case, said plunger having a longitudinal bore and a percussion-cap at its outer end, and pivoted and spring-pressed dogs carried by the case and normally engaging the plunger to hold it in its rearward position, as set forth.

3. The combination with a shell formed of detachable sections, of an exploding device in the shell, said device comprising a case divided by an apertured partition into two compartments, a fracturable closure for the inner compartment, a disk for closing the outer compartment and having a firing-point on its inner face, the outer compartment having a cavity on its inner peripheral surface, a firing-plunger in the outer compartment of the case and having a longitudinal passage and a reduced outer end, and pivoted and spring-pressed dogs mounted in the recess of the outer compartment and normally engaging the shoulder formed by the reduced end of the plunger, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LINDSAY GORDON ROACH.

Witnesses:
WILLIAM FRANKLIN COATES,
ALBERT BERNBEY BOTTS, JR.