C. V. RINEHART.

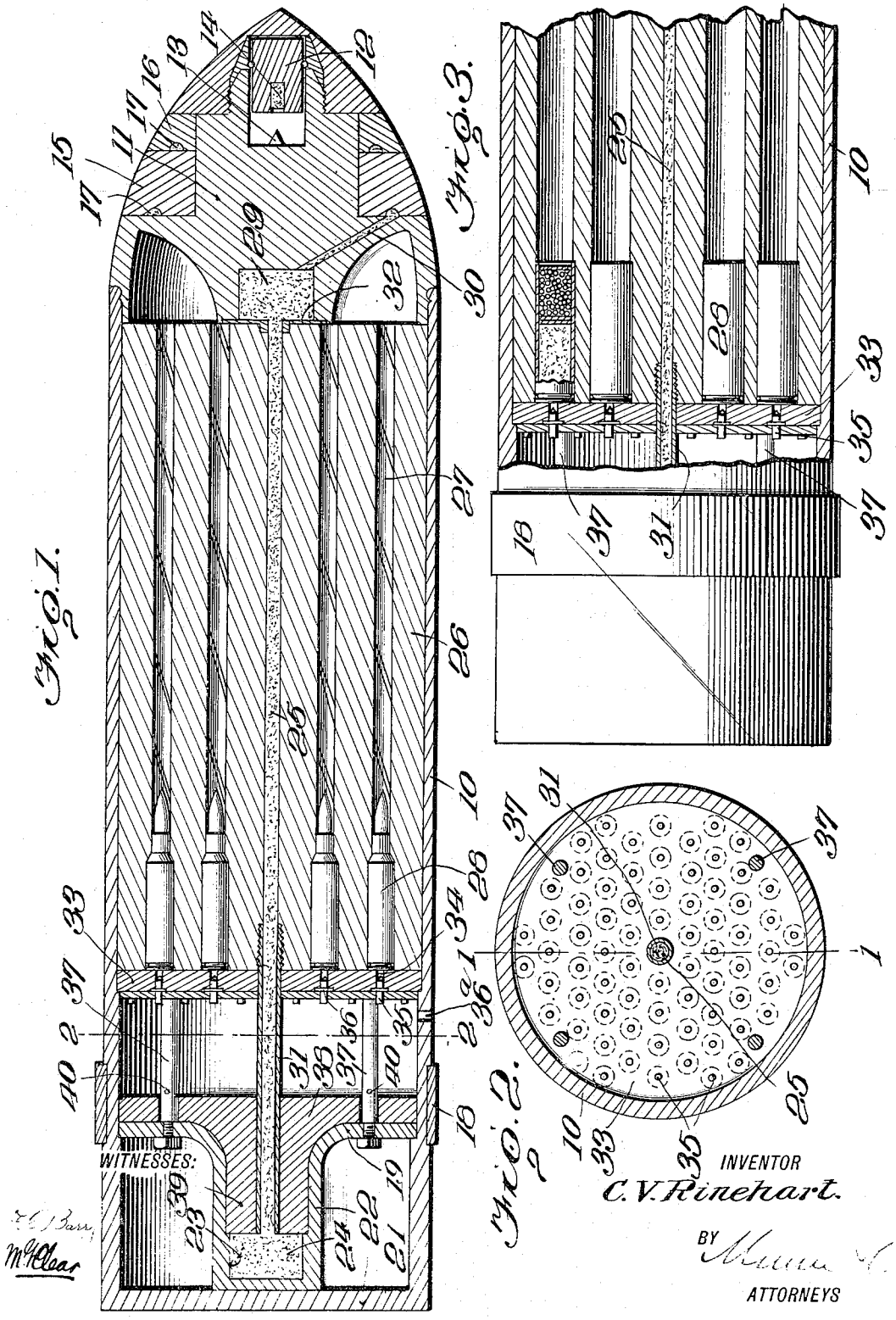
FIELD GUN PROJECTILE.

APPLICATION FILED MAY 25, 1916.

1,284,777.

Patented Nov. 12, 1918.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

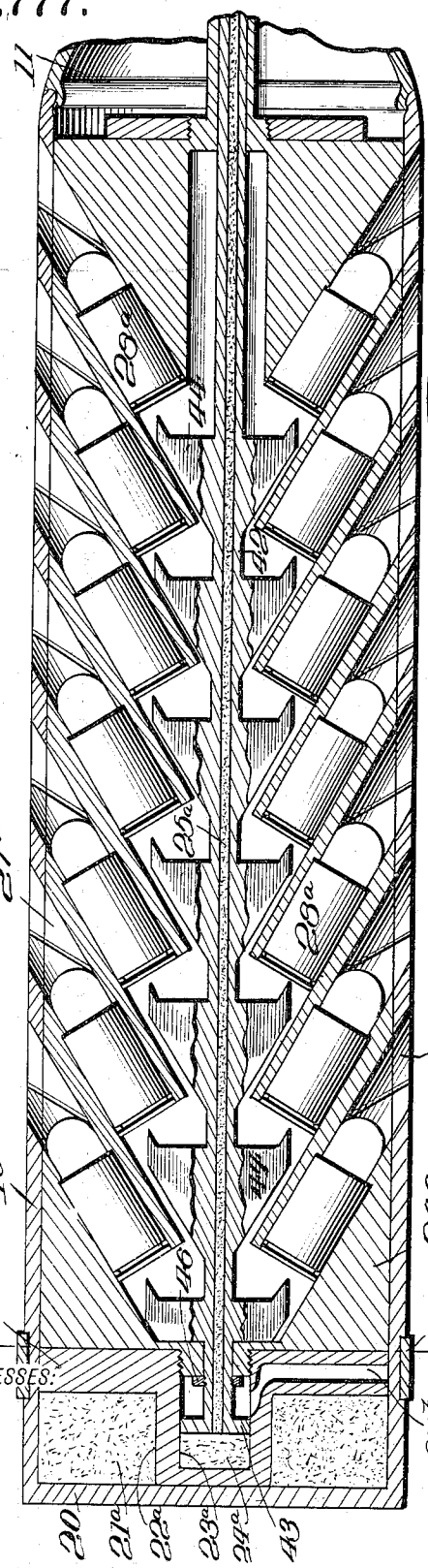


Fig. 4.

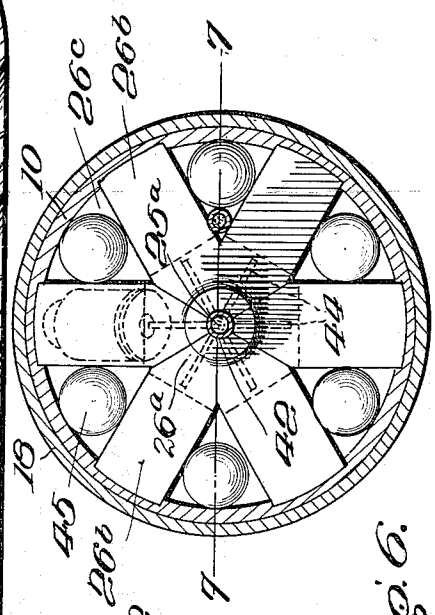


Fig. 6.

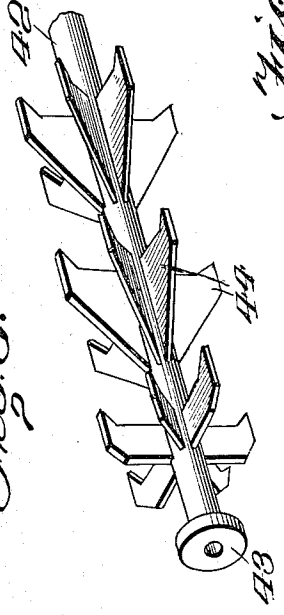


Fig. 5.

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3 SHEETS—SHEET 3.

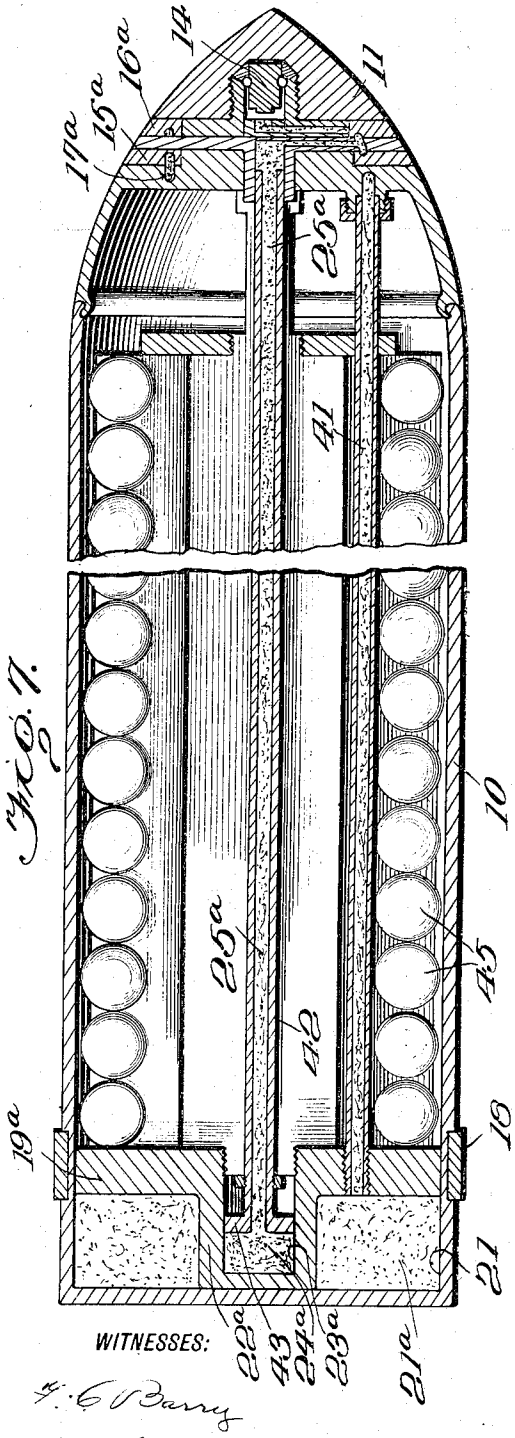


Fig. 7.

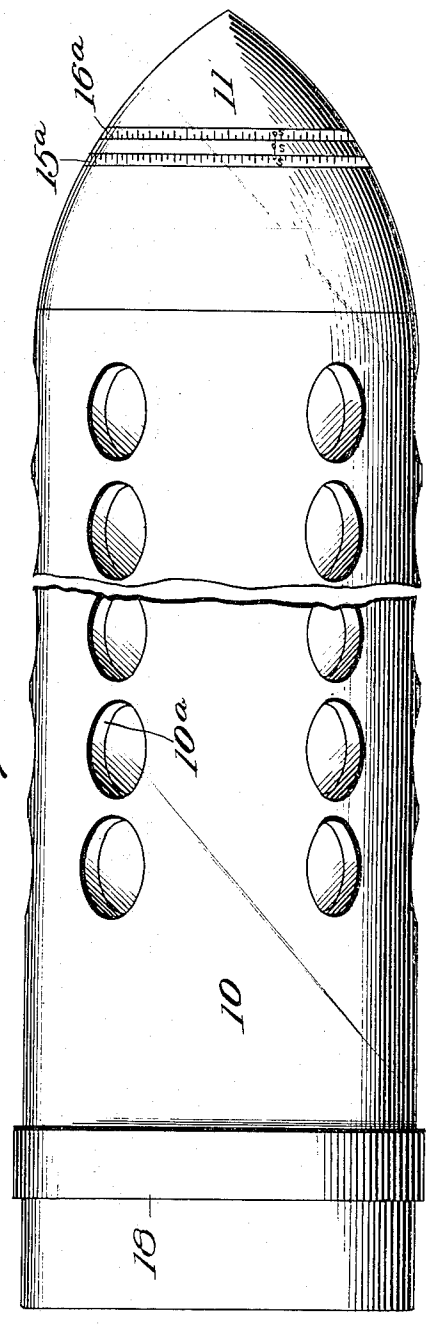


Fig. 8.

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FIELD-GUN PROJECTILE.

1,284,777. Specification of Letters Patent. Patented Nov. 12, 1918.

Application filed May 25, 1916. Serial No. 99,835.

To all whom it may concern:

Be it known that I, CHARLES VALENTINE RINEHART, a citizen of the United States, and a resident of Tucson, in the county of Pima and State of Arizona, have invented a certain new and useful Improvement in Field-Gun Projectiles, of which the following is a specification.

My present invention relates generally to field gun projectiles, and more particularly to shells of the general nature of shrapnel shells, my primary object being to provide for the timed release of missiles including propelling charges of their own, either with or without the usual shrapnel ball.

The other objects, relating as they do for the most part to the manner and means employed for the above purpose, together with the advantages resulting from the several objects, will more clearly appear from the following description of the invention, reference being made to the accompanying drawings, illustrating at least two of the forms in which it may be incorporated, and wherein:

Figure 1 is a central longitudinal section through a projectile constituting one form of the invention.

Fig. 2 is a transverse section therethrough taken substantially on line 2—2 of Fig. 1.

Fig. 3 is a view partly in elevation and partly broken away and in section of the base portion thereof.

Fig. 4 is a view similar to Fig. 1, illustrating a modified form of the invention.

Fig. 5 is a detail perspective view of a portion of the firing bolt shown in Fig. 4.

Fig. 6 is a cross section therethrough taken substantially on line 6—6 of Fig. 4.

Fig. 7 is a longitudinal section taken substantially on line 7—7 of Fig. 6.

Fig. 8 is an elevation of the shell shown in Figs. 4 to 7 inclusive.

Referring now to these figures, my invention contemplates the employment of a shell the body 10 of which is cylindrical and conformable therefore in size and shape to the approved forms now in use, and a cap 11 similarly conforming to the approved type and provided as usual with a concussion plunger 12 operating against a pin 13 to ignite the timer 14 from which the time train is fired, a portion of such time train being carried in each of the rings 15 and 16 as seen at the points 17.

The shell body is encircled near its base by the usual copper ring 18, and is, in accordance with this invention, provided within the base with a fixed disk 19 secured therein and spaced from the base of the shell body 10 as seen at 20, to form a chamber 21 for the reception of a bursting charge, the disk 19 having a hub portion 22 extending rearwardly into contact with the shell base 20 and providing a forwardly opening cylinder 23 in which is a propelling charge 24 connecting, through a fuse 25, with the time train of the cap 11.

Within the body 10 forwardly of the disk 19 is a fixed core 26 having a plurality of rifled bores for the reception of cartridges 28 corresponding in number of course to the numbers of the bores, the firing of which cartridges is accomplished through means actuated by the propelling charge 24 before mentioned.

In the form of the invention as shown in Figs. 1 to 3 inclusive, the several bores 27 of the core 26 are arranged parallel to the axis of the shell and the cartridge bullets are therefore propelled forwardly, for which purpose the head or cap 11 is provided at its inner surface and at a central point, with an unmasking charge 29 located in a recess in the cap and communicating with the time train 17 through a short fuse 30, the unmasking charge in turn communicating with the forward end of the fuse 25, the latter extending axially through the core 26 and through a tube 31 projecting rearwardly from the rear end of the core.

Thus, when the time train burns to the short fuse 30 and ignites the unmasking charge 29, the cap 11 is blown away from the shell, a resistance disk 32 being disposed against the forward end of the core centrally thereof and around the forward end of the fuse 25 to receive the impact of explosion of the unmasking charge 29. Thus the forward ends of the several bores 27 will be exposed to permit free passage of the cartridge bullets when the cartridges 28 are exploded.

Abutting the rear end of the core 26 is a disk 33 rigidly fixed in the shell body 10 and spaced forwardly from the disk 19 before mentioned, disk 33 having a plurality of apertures 34 registering with the rear ends of the bores 27 of the core 26 to receive firing pins 35, the latter having safety flanges 36 against the rear surface of the disk 33 which are sheared upon forceful

impact against the rear ends of the firing pins to drive the latter forwardly through the opening 34 and against the cartridges 28 and the space in the rear of disk 33 having a vent 36^a.

The disks 19 and 33 are connected by spaced pins or bolts 37 parallel to the axis of the shell body 10 and forming guides for a firing member 38, in this instance in the nature of a disk having a central rearwardly projecting hub portion 39 extending into the cylinder 23 and acting as a piston therein, the disk 38 being also guided upon the fuse tube 31 before mentioned.

Thus, after the unmasking charge has been fired as before described and the cap 11 blown off of the shell, at which time the resistance plate 32 drops away from the front end of the core 26, the fuse 25 fires the propelling charge 24 in the cylinder 23, acting against the piston 39 of the disk 38 to force this disk forwardly, shearing the resistance or safety wires 40 extending transversely through the guide bolts or pins 37. The disk 38 thus moves against the rear ends of the entire series of firing pins 35, driving the latter forwardly in the openings of the disk 33 and against the several cartridges 28 and exploding the latter in order to drive the bullets thereof outwardly through the bores 27.

The chamber 21 as before described may contain a bursting charge by which either the shell is shattered after striking or at a desired time, and for which purpose I have shown a separate longitudinal fuse 41 in Fig. 7, the rear end of which communicates with the chamber 21 containing the bursting charge 21^a, and the forward end of which communicates with a portion of the time train 17^a in Fig. 7, parts of which are carried in two movable rings 15^a and 16^a in this instance, by the relative adjustment of which the time of firing the fuse 41 may be controlled the same as the firing of the central propelling charge fuse 25^a is controlled.

In the form of my invention as shown in Figs. 4 to 8 inclusive, the central fuse 25^a extends axially through a firing bolt 42, the latter in turn movable axially of the shell body 10, with its rear flanged end 43 acting as a piston within the cylinder 23^a of the hub 22^a of disk 19^a, similar in construction to the disk 19 before described and having a vent 23^b. The core 26^a is in this instance, as best seen in Fig. 6, composed of a plurality of radially extending ribs 26^b, each rib having a longitudinally series of bores 27^a inclined forwardly and outwardly, these bores being rifled similarly to the bores 27 before described, and communicating at their outer ends with conformable openings 10^a in the shell body 10, so that the cartridges 28^a located within the inner ends of the bores 27^a will be discharged through the openings 10^a of the casing or shell body, thus obviating the necessity for unmasking the front end of the shell, as in the form of the invention previously described.

The core 26^a of the shape just described thus provides for axial movement of the firing bolt 42, the latter of which has clusters of radiating barbs 44 in its length alined with the inner ends of the several cartridges 28^a, so that when the bolt is propelled forwardly the several cartridges will be discharged. The particular shape of the core 26^a also provides triangular spaces as seen at 26^c, particularly in Fig. 6, between the ribs 26^b and the inner surface of the shell body 10, to receive longitudinal series of ordinary shrapnel balls 45 which are discharged as usual by a bursting charge, and in this instance by the bursting charge 21^a after the cartridges 28^a have been discharged.

It will be noted by reference to Fig. 4 that the rear end of the core 26^a is closed and forms bearing points centrally thereof for a resistance or safety flange 46 of the firing bolt 42, which is sheared when the propelling charge 24^a within the chamber 23^a is discharged, or rather, ignited by the fuse 25^a. It is obvious, however, that in either instance I secure the timed release of missiles having propelling charges of their own, and that this may be done according to my invention either with or without the usual shrapnel balls and the usual bursting charge and timed in relation to the timing of the firing of the bursting charge through the dual timing arrangement, seen best in Fig. 7, and as previously described.

It is obvious that my improved projectile will by the released missiles having their own propelling charges, greatly increase the range of ordinary shrapnel shells and that with a bursting charge and proper timing, it may be made to discharge the bullets to cover outer spaces of a target and subsequently disintegrated into deadly missiles covering the center of the target.

It will be further noted by reference to Fig. 6 that the core 26^a is segmental each segment being a tapered inner portion of one of the ribs 26^b and that these segments of the core have slots extending longitudinally and in which the several barbs 44 of the firing bolt are disposed adjacent the inner ends of the several bores 27^a.

I claim:—

1. A projectile having a core therein provided with a plurality of guide bores, a plurality of cartridges located and movable in the guide bores, a disk rigidly secured within the projectile adjacent the base thereof and having an axial cylinder, a firing member for exploding the cartridges having a portion thereof extending into the said cylinder, a propelling charge within the

cylinder, a fuse leading to the said propelling charge, and a timing mechanism for igniting the said fuse.

2. A projectile having a core provided with a plurality of guide bores, cartridges located and movable within the said guide bores, a firing member for exploding the said cartridges movable in the projectile and having a projection, a fixed member within the base of the projectile having a cylinder receiving the said projection, a propelling charge within the said cylinder, a fuse leading to the said propelling charge, and a timing mechanism for igniting the said fuse.

3. A projectile having a cylinder in its base, a propelling charge within the said cylinder, a firing member having a projection extending into said cylinder, a fuse leading to the said cylinder to ignite the charge therein, a timing mechanism for igniting the said fuse, and a plurality of cartridges within said projectile and exploded by the said firing member when the said propelling charge is ignited.

4. A projectile having a cylinder in its base, and a plurality of guide bores therein forwardly of said cylinder, a plurality of cartridges mounted in the said guide bores, a propelling charge within the said cylinder, a firing member for operating the cartridges having a projection extending into said cylinder, a fuse leading to the said cylinder to ignite the charge therein, and a timing mechanism for igniting the said fuse.

5. A projectile having a plurality of guide bores therein intermediate its ends, a propelling charge in the base of the projectile, a plurality of cartridges mounted in the guide bores, a firing member movable therein under the influence of the said propelling charge to explode the said cartridges, a fuse leading to the said propelling charge, and a timing mechanism for igniting the said fuse.

6. A projectile having a plurality of internal guide bores, a plurality of cartridges located in said guide bores, and means for discharging the said cartridges, said means including a movable firing member, and a propelling charge for moving said member.

7. A projectile having a plurality of cartridges therein, and a movable firing member for simultaneously discharging said cartridges.

8. A projectile having a main bursting charge, a propelling charge, a plurality of cartridges therein, a firing member for the cartridges actuated by the propelling charges, fuses leading separately to said combustible and propelling charges, and a dual timing mechanism for igniting said fuses.

9. A projectile having a main bursting charge, a propelling charge, a plurality of cartridges therein, a firing member for the cartridges actuated by the propelling charge, and means for igniting the said combustible and propelling charges in timed relation.

10. A projectile having a core therein provided with a plurality of ribs radiating from the axis of the projectile, and each provided with a series of bores at angles to the longitudinal axis of the projectile, cartridges located in the said bores, a firing member for exploding said cartridges, a propelling charge for actuating the firing member, and means for igniting the said propelling charge.

11. A projectile having a core therein provided with longitudinal spaced ribs and with guide bores in the said ribs, cartridges located in the guide bores, shrapnel balls located in the spaces between the said ribs, a firing member for the cartridges, a propelling charge for actuating said firing member, a bursting charge, and means for igniting the said charges.

12. A projectile having a core therein provided with longitudinal spaced ribs and with guide bores in the said ribs, cartridges located in the guide bores, shrapnel balls located in the spaces between the said ribs, a firing member for the cartridges, a propelling charge for actuating said firing member, a bursting charge, and means for igniting the said bursting charge and propelling charges in timed relation.

13. A projectile having a slotted segmental core provided with a plurality of radial inclined bores, a plurality of cartridges located in said bores, a firing bolt movable axially of the core, and a plurality of firing barbs carried by the said bolt and movable in the slots of the core.

14. A projectile having a main bursting charge, a propelling charge, a plurality of auxiliary projectiles with their projecting charges, a firing member for the last named charges actuated by the propelling charge, and means for igniting the main bursting and propelling charges in timed relation.

15. In a projectile, a plurality of longitudinally extending rifle barrels, an auxiliary projectile mounted in each rifle barrel, a firing disk mounted for movement to simultaneously discharge the several auxiliary projectiles, and a means to move said disk after a predetermined time to thus increase the range of the projectile.

16. A projectile having a plurality of bores, auxiliary projectiles in said bores, a firing pin associated with each of said auxiliary projectiles and a single firing member to directly and simultaneously actuate a plurality of said firing pins, thereby discharging the auxiliary projectiles.

17. A projectile having a plurality of bores, auxiliary projectiles in said bores, a firing pin associated with each of said auxiliary projectiles, a single firing member to

directly and simultaneously actuate a plurality of said firing pins, thereby discharging the auxiliary projectiles, and an explosive charge to actuate said firing member.

18. A projectile comprising a body having series of charge receiving bores disposed obliquely or otherwise with respect to the longitudinal axis of the body and piercing the side walls thereof, and a firing plunger extending centrally and longitudinally within said body and having firing pins in line with said bores.

19. In a projectile, a plurality of barrels, an auxiliary cartridge mounted in each barrel, a firing disk mounted for movement to simultaneously discharge several auxiliary projectiles, and a means to move said disk after a predetermined time.

CHARLES VALENTINE RINEHART.