C. GERDOM.

SMOKELESS POWDER CHARGE.

APPLICATION FILED JAN. 27, 1915. RENEWED SEPT. 5, 1917.

1,274,258.

Patented July 30, 1918.

2 SHEETS—SHEET 1.

Fig. 1

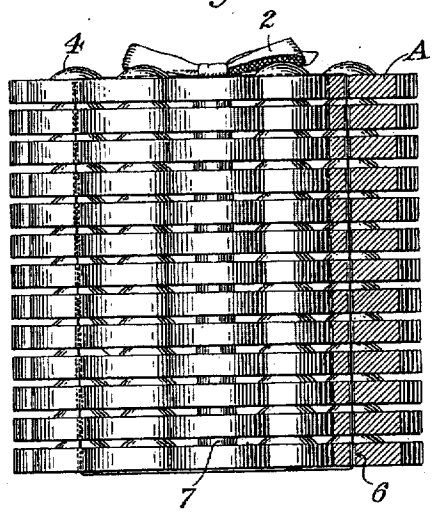

Fig. 2

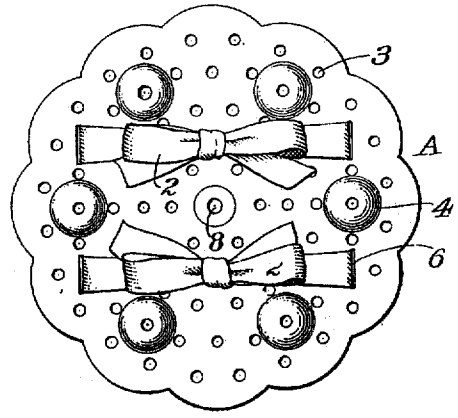

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Fig. 3

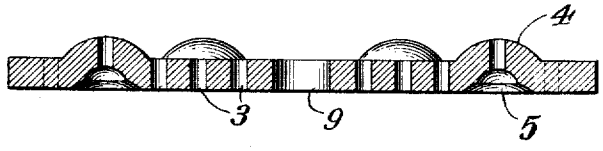


Fig. 4

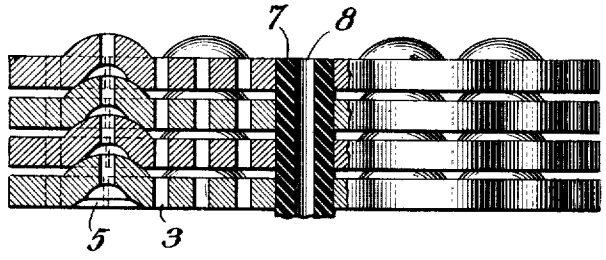
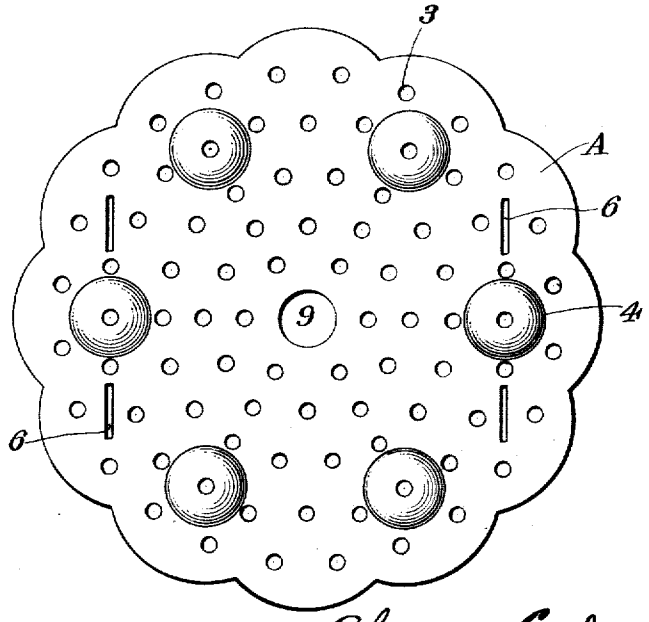


Fig. 5



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UNITED STATES PATENT OFFICE.

CLARENCE GERDOM, OF FORT HANCOCK, NEW JERSEY, ASSIGNOR TO ORDNANCE IMPROVEMENT COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SMOKELESS-POWDER CHARGE.

1,274,258. Specification of Letters Patent. **Patented July 30, 1918.**

Application filed January 27, 1915, Serial No. 4,615. Renewed September 5, 1917. Serial No. 189,883.

To all whom it may concern:

Be it known that I, CLARENCE GERDOM, a citizen of the United States, and resident of Fort Hancock, county and State of New Jersey, have invented certain new and useful Improvements in Smokeless-Powder Charges, of which the following is a specification.

My invention relates to the manufacture of smokeless powder charges, its object being to provide a form of grain especially adapted for use in breech loading ordnance. I accomplish this by making the grains in disk form of such diameter as to fit the powder chamber of the particular caliber of gun, and of proper thickness, and otherwise so shaped that when superposed or built up into proper size for a gun charge, the disks shall be interspaced from each other and partially spaced from the walls of the chamber, and also longitudinally perforated, in a manner similar to other forms of grains.

Another important feature is the providing of an ignition charge of black powder to be fitted to the firing charge of smokeless powder just before insertion into the gun, the black and smokeless powder being kept entirely separate at all other times.

In the accompanying drawings forming part of this specification,

Figure 1 is a side elevation in partial cross section of a charge of my improved powder;

Fig. 2 is a plan view of the same;

Fig. 3 is a detail vertical section of one of the grains;

Fig. 4 is a sectional detail of a series of grains superposed upon each other showing the ignition charge in place; and

Fig. 5 is a plan view of a single grain.

In the drawings, Fig. 1 represents a charge of my improved powder made up of a series of superposed grains A, and secured together by raw silk ribbons 2 passed through openings in the several disks and tied as shown in Fig. 2. Each grain, (see Fig. 5) is formed preferably with a scalloped edge as shown, the maximum diameter being substantially that of the chamber to which the charge is to be fitted, but leaving spaces around the periphery for the passage of gases in the combustion of the charge. The grain is also pierced longitudinally with a series of perforations 3 to facilitate combustion, and is provided also on one face with knobs or bosses 4, and with corresponding sockets or depressions 5 on the reverse side which serve to interspace the several disks when superposed, and also to hold them in mutually registering positions. In order to hold them in assembled position for a built-up charge, registering openings, preferably of slitted form 6, are provided to receive ribbons 2 for holding the grains, thereby dispensing with the bags ordinarily used. When so assembled and secured together the "charge" of powder can be stored in any desirable way, and be available for instant use.

For the igniting of the charge I provide a cylinder 7 of compressed black powder, having an axial combustion opening 8, the cylinder being of such size as to fit into the axial opening 9 in the several disks. It is obvious that the shape and dimensions of the disks or grains, and ignition charge may be varied at will to suit any conditions of use.

It is desirable in the forming of the registering bosses and corresponding depressions or sockets of the disks, in arranging the longitudinal perforations, and determining the thickness of the disks, to maintain throughout the entire charge when assembled as nearly as possible uniform thicknesses throughout the disks, and also of the walls or partitions between the perforations, so that the progress of combustion shall be substantially uniform throughout the charge.

In the shaping of my improved form of smokeless powder grain the compression of the colloidal mass, adds to the density and strength of the finished grains, thereby making them less liable to breakage, and the grains being of such diameter as to practically occupy the full diameter of the chamber are less liable to breakage from impact upon the walls, than with other forms of grains.

While the preferred shape of the powder grains is that of a substantially plane surfaced disk, if desired they may be spherically or otherwise curved, or varied in other particulars, from a true plane and still embody the gist of my invention, which consists in making the powder grains of such shape that they may be as-

sembled in a charge which as a whole shall conform to the chamber of the gun, and provided with continuous, longitudinal and lateral gas passages therethrough.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A gun charge of smokeless powder comprising a series of unit grains assembled and detachably bound together in collective form to fit the gun chamber, having continuous longitudinal and lateral gas passages therethrough, and provided with an ignition powder element extending longitudinally therethrough.

2. A gun charge of smokeless powder comprising a series of interlocked, interspaced, superposed, unit disk grains detachably bound together in collective form to fit the gun chamber, having continuous longitudinal gas passages therethrough, and having an ignition powder element in the form of a hollow cylinder fitting loosely in a longitudinal opening therethrough.

3. A smokeless powder charge, comprising similar interlocked grains, tying devices confining them in assembled position, and an ignition charge removably arranged therein.

4. A smokeless powder charge made up of similar interlocked grains arranged in a mass fitted to the gun chamber, tying devices therefor, and an ignition charge arranged axially therein.

5. A smokeless powder charge comprising, a series of interlocking disk-like grains, tying devices confining them in assembled position and an ignition charge removably arranged therein.

6. A two-part gun charge comprising a propulsive element of smokeless powder grains confined in a mass to fit the gun chamber, and a distinct independent ignition element of black powder arranged as a core therein and extending longitudinally substantially therethrough.

7. A powder charge comprising two elements, viz: a propulsive element made up of smokeless powder grains confined in a homogeneous mass to fit the gun chamber and an ignition element arranged as a core therein and extending longitudinally substantially therethrough.

8. A two-part powder charge comprising a propulsive element of smokeless powder grains confined in a mass to fit the gun chamber and a self-contained independent ignition charge arranged longitudinally therein.

9. A two part powder charge comprising a propulsive element of smokeless powder grains confined in a homogeneous mass adapted to fit a gun-chamber and an independent ignition charge extending longitudinally substantially therethrough and itself having a free air passage extending longitudinally therethrough.

10. A two part power charge comprising a propulsive element of smokeless powder grains confined in a mass adapted to fit a gun-chamber and an independent ignition charge extending longitudinally substantially therethrough and itself having a free air passage extending longitudinally therethrough.

Signed at Highlands, in the county of Monmouth and State of New Jersey, this 23d day of January, 1915.

CLARENCE GERDOM.

Witnesses:
WALTER V. STANTON,
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."