

UNITED STATES PATENT OFFICE.

ERNST SOKOLOWSKI, OF HAMBURG, GERMANY, ASSIGNOR TO E. I. DU PONT DE NEMOURS POWDER COMPANY, OF WILMINGTON, DELAWARE, A CORPORATION OF NEW JERSEY.

PROJECTILE-LOADING FOR SCATTERING CHARGES.

1,015,215.

Specification of Letters Patent.

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No Drawing.

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To all whom it may concern:

Be it known that I, ERNST SOKOLOWSKI, a subject of the Emperor of Germany, residing at Hamburg, Germany, have invented a new and useful Improvement in Projectile-Loading for Scattering Charges, of which the following is a full, clear, and exact description.

My invention relates to an improved loading of uniform projectiles for guns, hand grenades, and the like, in which a scattering charge similar to shrapnels is embedded in plastic trinitrotoluol.

Heretofore balls, or the scattering charge similar in shape to balls, were loaded in the projectile by being placed in the explosive, for instance trinitrotoluol, by the trinitrotoluol in a fused state, being poured into the space between the balls and permitted to chill. Trinitrotoluol, in a crystalline condition, had also been pressed between the balls. The pouring method has the disadvantage that the fused trinitrotoluol between the balls is too inert, that is, its property of detonation and propagating the detonation is such that large priming charges and strong caps are required to be used in order to insure, with certainty, a detonation. With the pouring method also the balls or parts of the scattering charge are placed in such a manner that they are not insured against too close relation of the parts of the scattering charge. If they are brought too close together, there is a liability of a premature ignition of the explosive which causes detonations in the barrel of the gun which are greatly to be feared. Even if this does not occur, the center of gravity of the projectile is changed due to the shifting of the balls or the parts of the scattering charge, and the line of flight of different projectiles is not uniform. It is for this reason generally preferred to place the balls in a fixed position by means of pressing. This is of special importance in view of the certainty of the propagation of detonation, and crystalline, weakly pressed trinitrotoluol is considerably more sensitive and capable of propagating the detonation than fused trinitrotoluol. Pressed trinitrotoluol has, however, the disadvantage that the explosive is pressed in crystalline state and that as a consequence thereof the same is embedded dry and in extremely finely divided state between the balls or parts of the scattering charge.

Besides the danger present in carrying out the process of pressing, it is of disadvantage that considerable pressure is required in order to obtain a solid structure in the explosive material in such manner that the balls, etc., appear sufficiently supported by same. This rigidly placing of the balls can be obtained only in such manner that the balls prepared of yielding material such as hard lead are more or less deformed and that they lose the shape which for reasons of suitability has been imparted to them. In the case of balls made of a harder material, such as steel, or forged iron, the pressing method is not suitable on account of the danger of an explosion during the pressing. Due to the fact that it is hardly possible to prevent with certainty the shifting of some of the balls during the first impact of the projectile in the barrel of the gun, there is at all times to be considered the danger of the possibility of a premature ignition of the explosive, even when pressed crystalline trinitrotoluol is used. I overcome these disadvantages by my invention, which consists in forming the embedding charge of plastic trinitrotoluol.

In carrying out my invention I press plastic trinitrotoluol into one or more layers of the balls or scattering charge. The trinitrotoluol being plastic, the pressure need be but slight and is continued until the space available for the explosive charge is filled. Balls and plastic trinitrotoluol can also be placed in the projectile in alternate layers and pressed together.

My invention, has, among others, the following advantages: Plastic trinitrotoluol detonates easily and with certainty, propagates the detonation with utmost certainty, and detonates with a strength which is hardly inferior to that of pure crystalline trinitrotoluol. It is readily and with certainty pressed by means of a weak pressure into the interstices between the balls and the other parts of the scattering charge. It fills the interstices well. The balls are not deformed owing to the weak pressure used. Premature ignitions are not to be expected owing to the weak pressure used and owing to the moist, fatty character of the plastic trinitrotoluol; the moisture content of the plastic trinitrotoluol acts during the operation of pressing in the manner of a lubricant. This is also the case during firing. The balls, or scattering charge are held in an exceedingly

rigid fixed position, the explosive pressed to a solid mass offering to the balls a more solid support, than is the case, when using, for instance weakly pressed crystalline trinitrotoluol. This reduces to a minimum the possibility of detonations in the barrel of the gun. My improvement can be used for yielding balls made of hard lead and for less yielding balls, for instance made of steel, forged iron, etc., without the danger of explosions during the pressing and during the shot which heretofore had to be considered during this operation.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:

1. An improved projectile loading for scattering charges, comprising a scattering charge embedded in plastic trinitrotoluol.

2. An improved projectile loading for scattering charges, comprising a scattering charge embedded in pressed plastic trinitrotoluol.

3. An improved projectile loading for scattering charges, comprising balls rigidly placed by means of embedding formed of plastic trinitrotoluol.

4. An improved projectile loading for scattering charges, comprising balls rigidly placed by means of embedding formed of pressed plastic trinitrotoluol.

In testimony of which invention, I have hereunto set my hand, at Hamburg, on this 24th day of May, 1911.

ERNST SOKOLOWSKI.

Witnesses:

PLOKSOU NAOUM,
ERNEST H. L. MUMMENHOFF.