E. SOKOLOWSKI.

GRENADE.

APPLICATION FILED DEC. 29, 1911.

1,035,486. Patented Aug. 13, 1912.

FIG. 1.

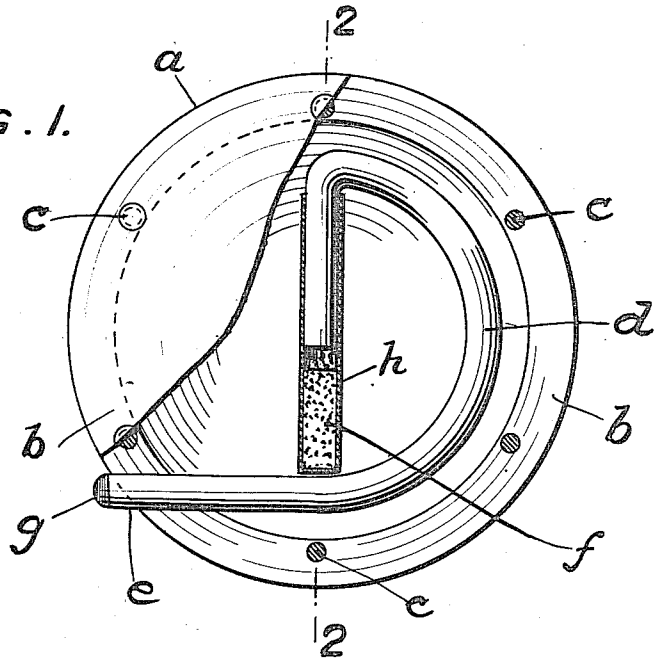
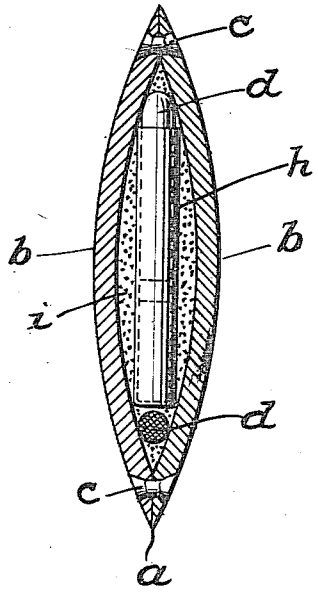


FIG. 2.



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GRENADE.

1,035,486. Specification of Letters Patent. Patented Aug. 13, 1912.

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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 Grenades, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to hand grenades and particularly those of lentil shape. This form of grenade has the advantage that when thrown by hand it more readily overcomes the resistance of the air and can therefore be thrown a relatively great distance. Nevertheless, they present certain disadvantages, inasmuch as when the explosive detonates the casing is broken into small pieces which scatter in every direction; and as the distance to which the grenade can be thrown is limited by the force of the human arm, the thrower and his comrades are liable to be injured as a result of action in a backward direction.

The object of my invention is to so construct the grenade that the bursting action will be at the sides only; that is, in directions at a considerable angle to a plane extending through the greatest diameter of the grenade. Inasmuch as this plane extends toward the thrower, at whatever angle the grenade is thrown, whether horizontally, vertically, or obliquely, it is obvious that, if the missiles discharged by the explosion cannot be hurled in a direction more or less nearly parallel to the largest cross-section of the grenade, they cannot be propelled in a backward direction.

The above object is obtained by constructing the grenade in substantial accordance with the drawings, in which—

Figure 1 is an elevation principally in central section of a hand grenade embodying my invention. Fig. 2 is a cross section on line 2—2, Fig. 1.

The casing *a* is composed of two shallow metal cups *b* having walls whose thickness is substantially greater than the internal depth of the cup for a substantial distance from the margin thereof. The periphery of the cups is unflanged and its edge is flattened in a plane coincident with the largest cross-section of the grenade, so that the two cups will fit together. The two cups *b* are held together by means of the rivets *c* extending through the abutting peripheral portions of the two cups, the riveting being done cold by means of suitable pliers, whereby the connection between the same is relatively loose so as to permit of their ready separation upon detonation.

The detonation may be effected in a simple manner by means of a piece of time fuse *d*, which, with the exception of a small piece *e*, which is visible outside of the grenade, is embedded in the grenade. This incasing of the fuse in the grenade prevents a tearing out of the same which, under other conditions, is possible. To the end of the fuse inside of the grenade, a detonating cap *f* is fastened and sealed by means of a special insulating material. This cap *f* can also be protected by means of a special protecting cap *h* tightly surrounding the same. The ignition of the fuse brings about the detonation of the cap and of the explosive charge. To the outside end of the fuse a fuse igniter of any desired construction is fastened, for instance, by igniting the fuse by means of a matchhead *g* with which the end of the fuse is provided and which rubs against a phosphorus friction surface. Such friction surface is available on the outside of every hand grenade in such manner that the fuse end of one grenade can be ignited by rubbing same against the friction surface of the other. Such friction surfaces can also be provided on the transportation receptacles, or match boxes may be used for this purpose. Lighted cigars, fuses, etc., may also be used for igniting the fuse. The friction matchhead is protected by means of a strip of cloth tightly wound around same and which by means of shellac or of a similar material is fastened to both cups of the hand grenade. In place of the strip of cloth pieces of wood or of a similar material provided with grooves for the matchhead can be provided, being glued together in such manner that they cover the friction matchhead and protect same against possible damage from the outside. Before the grenade is used the strip of cloth and the pieces of wood are torn off. For these projectiles any desired brisant explosive can be used as explosive charge. Trinitrotoluol is very suitable for this purpose. In the example shown in Figs. 1 and 2, in which the detonating cap *f* is in permanent connection with the explosive charge *i*, the weight of the explo-

sive charge does not exceed 20 g. which is done so as to come within the regulations for transportation in certain countries, for instance, Germany. In the case of discus hand grenades with larger charges it is recommended to separate the cap from the explosive charge and to place the former in position shortly before the projectile is used.

After the ignition of the mixture, the discus grenade is thrown in such manner that the same flies with the pointed sides to the front and to the back. An action in backward direction is rendered almost impossible, due to the fact that the cups of the casing of the projectile are broken strongly in a sidewise direction, scattering pieces which are embedded in the projectile participating in the same. It will be easily seen that it does not make any difference whether the cross section surface of the flying discus grenade is pointed vertically or in any other direction, or even horizontally toward the ground. In all these instances, as has been shown by practice, a danger to the throwing party caused by pieces flying in a backward direction is equally improbable.

In constructing the small grenades it is recommended in order to economize space not to use a hitting igniter together with the igniting mixture as described, while when constructing large projectiles double means of ignition may be used.

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

1. A hand grenade composed of two shallow abutting cups having walls of substantial thickness and of greater thickness than the depth of the space within the cup for a substantial distance inwardly from the inner margins of the walls of the cup, the peripheral portions of the cups being loosely connected, whereby the grenade may be thrown with certainty in a plane coincident with the largest cross-section of the same while the force of explosion will be at a substantial angle to said plane and thereby prevent backward action toward the thrower.

2. A hand grenade composed of two shallow cups whose peripheral portions are unflanged and flattened in a plane substantially coincident with the largest cross-section of the grenade, the flattened peripheral portions of the cups abutting together, the wall of each cup being of a thickness substantially greater than the internal depth of the cup for a substantial distance inwardly from the inner margin of the wall, and means to loosely connect the peripheral portions of the two cups.

3. A hand grenade composed of two shallow cups whose peripheral portions are unflanged, the wall of each cup being of a thickness substantially greater than the internal depth of the cup for a substantial distance inwardly from the inner margin of the wall, the peripheral portion of said wall being flattened in a plane substantially coincident with the largest cross-section of the grenade and the flattened peripheral portions of the two cups abutting together, rivets extending relatively loosely through the peripheral portion of the casing, and a fuse extending within the casing between the two cups throughout all of its length except a relatively short end projecting through the casing.

In testimony of which invention, I have hereunto set my hand, at Hamburg, on this 29th day of Nov., 1911.

ERNST SOKOLOWSKI.

Witnesses:
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IDA CHRIST. HAFERMANN.