F. E. ARNDT.

PROJECTILE.

APPLICATION FILED JUNE 1, 1915.

1,174,925. Patented Mar. 7, 1916.

Fig. 1

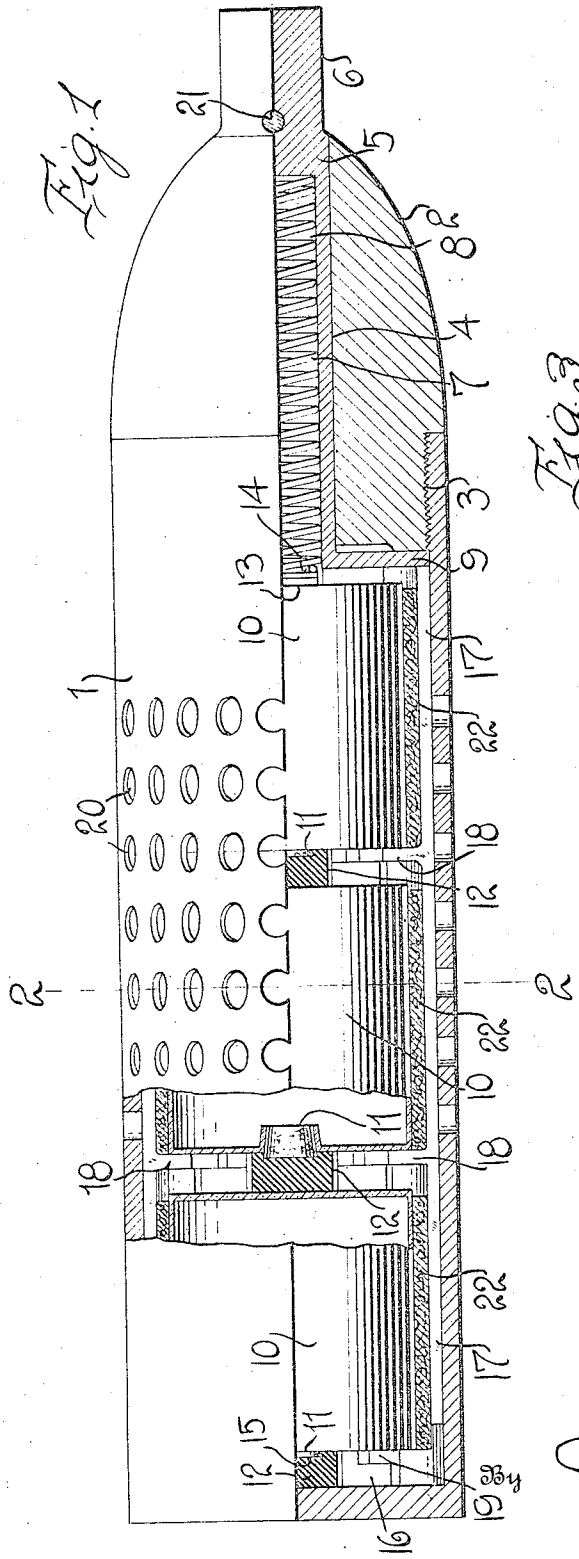


Fig. 3

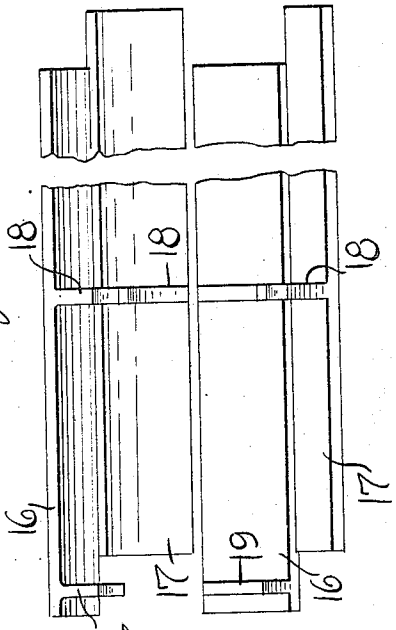
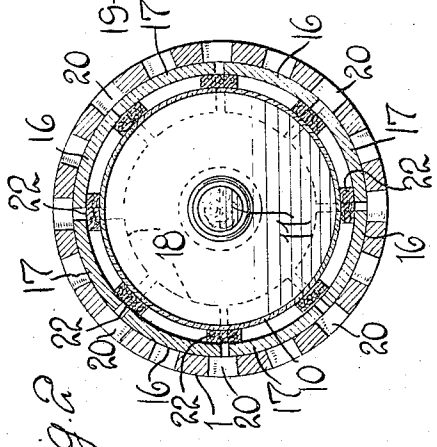


Fig. 2



Inventor

F. E. ARNDT

Frederick A. Stitt.

Attorney

UNITED STATES PATENT OFFICE.

FRANKLIN E. ARNDT, OF GALION, OHIO, ASSIGNOR OF ONE-HALF TO DAVID C. BOYD, OF GALION, OHIO.

PROJECTILE.

1,174,925. Specification of Letters Patent. Patented Mar. 7, 1916.

Application filed June 1, 1915. Serial No. 31,558.

To all whom it may concern:

Be it known that I, FRANKLIN E. ARNDT, a citizen of the United States, residing at Galion, in the county of Crawford and State of Ohio, have invented certain new and useful Improvements in Projectiles, of which the following is a specification.

This invention comprehends certain new and useful improvements in projectiles for use in warfare, and has for its primary object a simple and very efficient construction of projectile in the form of a shell designed to contain chemicals of a predetermined or specified nature, relatively harmless in themselves and held separate and distinct from each other in receptacles contained within the body portion of the shell and formed of glass or of some other fragile substance or material, the parts being so arranged that when the shell strikes, the receptacles will be instantly and positively broken and crushed, whereby the chemicals will commingle and produce a destructive charge, although the construction and arrangement of the parts are such as to enable the shell to be handled with perfect safety so long as the fragile receptacles are intact.

The invention has for a further object a projectile of this character provided with an improved construction and arrangement of parts for holding the chemical containers or receptacles in the body portion of the shell in such a manner that they will be maintained effectually as against movement and accidental breakage, while at the same time they will be positively crushed upon the impact of the shell plunger with the object.

The invention also aims to provide a device of this character composed of comparatively few parts that may be easily manufactured and readily assembled, so that the projectiles can be made at a relatively low cost and turned out quickly in large quantities, particularly to supply an emergency demand such as is so frequently made in times of war. And the invention also aims to generally improve devices of this class so as to render them more destructive and available.

With these and other objects in view, as will more fully appear as the description proceeds, the invention consists in certain constructions, arrangements and operations of the parts that I shall hereinafter describe and claim.

For a full understanding of the invention reference is to be had to the following description and accompanying drawing, in which—

Figure 1 is a longitudinal view of a projectile embodying the improvements and principles of my invention, the projectile being shown half in section and half in side elevation to economize space. Fig. 2 is a transverse sectional view, the section being taken substantially on the line 2—2 of Fig. 1. Fig. 3 is a detail view of some of the receptacle holding and crushing devices, the same being shown in their relative positions and alternate arrangements for effective operation, as will be hereinafter more specifically set forth.

Corresponding and like parts are referred to in the following description and designated in all of the views of the accompanying drawing by like reference characters.

Referring to the drawing, the numeral 1 designates the body portion of my improved shell or projectile, said body portion being hollow, as shown, and being provided with a head 2 detachably secured thereto in any desired way as, for example, by the screw-threaded connection 3. The head 2 is formed with a centrally disposed longitudinal opening 4 designed to receive and accommodate a plunger 5 having a protruding end 6 which is designed to strike the object aimed at so as to force the plunger inward against the tension of a coiled expansion spring 7 which is mounted in a longitudinally disposed opening or bore 8 formed in the plunger and opening at the inner end thereof where the plunger is formed with a disk-like head 9, preferably of a diameter substantially equal to the interior diameter of the body portion 1.

Mounted within the body portion 1 is any desired number of receptacles, there being three in the present embodiment of the invention, all of corresponding size and formation, although it is to be understood that the invention is not limited in this regard or to the number of the receptacles employed, said receptacles being preferably formed of glass or some other fragile substance or

material and being designated 10. Each receptacle is formed with a filling opening adapted to be closed by a sealing device or stopper 11, preferably of glass, ground in, and the open ends of the receptacles or containers 10 preferably all face the same way (in the present instance, toward the inner end or bottom of the shell), and cushions 12 of rubber or the like are interposed between the receptacles or containers, as shown, one of these cushions being also interposed between the bottom of the shell and the next adjacent container, while another one, designated 13, is interposed between the spring 7 and the container adjacent thereto, said last named cushion being preferably formed with a neck 14 which extends into the spring any desired distance. Preferably the cushions 12 are located centrally, as are the stoppers or sealing devices 11, and are preferably recessed, as at 15, so that the projecting portions of the stoppers will fit therein, as clearly illustrated in the drawing.

One of the main features of my invention resides in the means that are provided for positively and simultaneously crushing all of the receptacles when the plunger strikes an object and is moved in relative to the body of the shell and these means will now be described.

The means just referred to, comprise a plurality of bars that extend longitudinally of the body portion 1 of the shell within the same and in engagement with the inner wall thereof, said bars being arranged in two series and the bars of one series alternating with the bars of the other series. For the purposes of distinction, the bars of one series are designated 16 and the bars of the other series 17. The bars 16 are so formed and arranged that their inner or lower ends rest upon the bottom of the shell, while their opposite ends preferably stop short of the outer end of that receptacle or container which lies next to the head 9 of the plunger 5. The bars 17 are so formed and arranged that they project at one end beyond the container just referred to and abut against the head 9 while their other ends stop short of the bottom of the shell. The bars of both sets are provided with correspondingly formed inwardly projecting lugs 18 that are arranged in sets, together forming sectional and segmental rings or annuli extending into the spaces between the receptacles 10 and engaging one end thereof, while the bars 16, as hereinbefore specifically referred to, are further formed near one end with similar lugs designated 19, slightly spaced from the bottom of the shell and engaging the adjoining end of the nearest receptacle.

From the foregoing description in connection with the accompanying drawing, the operation of my improved projectile will be apparent. In the practical use of the device, different chemicals are poured into the respective receptacles 10; the receptacles are then sealed and they are then slipped into the body portion 1 of the shell surrounded by the crushing bars 16 and 17 disposed in the relative arrangement hereinbefore specified, every other bar at one end abutting against the bottom of the shell and the remaining bars spaced at their corresponding ends from the bottom of the shell and designed to abut at their other ends against the head 9 of the plunger 5 when the head 2 of the shell is screwed into the body portion thereof. Consequently, when the projectile strikes its object, the impact of the protruding end 6 of the plunger will cause the latter to move inwardly and the longitudinal movement of the bars caused by the engagement of the head 9 of the plunger will cause the lugs 18 of the bars to positively and simultaneously crush the receptacles or containers, this action being also facilitated by the head 9 itself, and as the chemicals contained within the receptacles 10 will thereupon be instantly mixed, to produce the destructive charge which will pass through the ports 20 that are formed in any desired number in the body 1 of the shell.

It will thus be seen that I have provided a very effective projectile which may be very safely handled as the spring 7 will normally hold the plunger 5 in its extended position and which will instantly act, upon striking an object, to generate the charge, means being provided whereby all of the receptacles will be positively crushed, and all liability of failure in the generation of the gases or fumes will be precluded.

Preferably, the plunger 5 is formed in the protruding end 6 thereof with an openig 21 extending therethrough or thereinto, designed to receive a pin or the like which will engage the adjoining edge of the head 2 so as to prevent the accidental inward movement of the plunger, whereby the shell or projectile may be handled with perfect safety; and preferably the packing strips 22 of felt or the like are interposed between the side walls of the receptacles or containers 10 and the bars 16 and 17, so that said receptacles will stand very little, if any, chance of becoming broken, except by an inward movement of the plunger and the consequent longitudinal movement of the bars and their breaking lugs.

While the accompanying drawing illustrates what I believe to be the preferred embodiment of my invention, it is to be understood that the invention is not limited thereto, but that various changes may be made in the construction, arrangements, and proportions of the parts without departing from

the scope of the invention as defined in the appended claims.

What is claimed is:—

1. A projectile of the character described, including a shell, a receptacle mounted therein, and spaced from the wall thereof, a plunger carried by the shell, and a bar mounted within the shell exteriorly of the receptacle and movable longitudinally of the shell, by and upon the inward movement of the plunger, said bar being formed with a lug extending inwardly along the receptacle and in contact therewith.

2. A projectile of the character described, including a shell, a plurality of receptacles designed to contain gas producing chemicals, and mounted within the shell in spaced relation to each other, a plunger carried by the shell, and a plurality of bars surrounding the receptacles between the latter and the interior wall of the shell, and provided with lugs extending in between the receptacles for the purpose specified, sundry of said bars being designed for engagement by the plunger, as and for the purpose set forth.

3. A projectile of the character described, including a shell, a plurality of receptacles mounted therein and adapted to contain gas producing chemicals, the receptacles being disposed in spaced relation to each other, a plunger carried by the shell, a plurality of bars encircling the receptacles and interposed between the same and the interior wall of the shell, said bars being formed with lugs extending inwardly into contact with the receptacles, and sundry of said bars engaging the plunger at one end and movable thereby, longitudinally of the shell, as set forth.

4. A projectile of the character described, including a shell, a plunger carried thereby, a plurality of receptacles mounted within the shell and adapted to contain gas producing chemicals, the receptacles being mounted in spaced relation to each other, and in spaced relation to the bottom of the shell, bars disposed longitudinally in the shell, between the interior wall of the latter and the receptacles, and formed with lugs extending into the space between the receptacles, sundry of said bars being formed with other lugs extending into the space between the bottom of the shell and the adjacent receptacle and other of said bars projecting beyond the receptacle with their ends abutting against the plunger.

5. A projectile of the character described, including a shell, receptacles mounted within the shell, and disposed in spaced relation to each other, and in spaced relation to the bottom of the shell, said receptacles being adapted to contain gas producing chemicals and formed with filling openings, sealing devices for said openings, cushions interposed between the receptacles and engaging said sealing devices, another cushion interposed between the bottom of the shell and the sealing devices of the adjoining receptacle, and engaging the same, a plunger carried by the shell, and crushing bars extending longitudinally of the shell between the inner wall thereof and the receptacles, said bars being formed with lugs extending into the spaces between said receptacles, sundry of the bars being formed with lugs extending into the spaces between the bottom of the shell and the adjoining receptacle, and other bars being arranged at one end in abutting relation to the plunger, and adapted to be removed thereby, longitudinally within the shell.

6. A projectile of the character described, including a shell, a plurality of fragile receptacles mounted therein in spaced relation to each other and adapted to contain gas producing chemicals, a plunger carried by the shell at one end thereof, crushing bars disposed longitudinally within the shell between the inner wall thereof and the receptacle, the bars being formed with lugs extending inwardly into engagement with the receptacles and some of said bars being disposed in abutting relation to the plunger and adapted to be moved longitudinally thereby, and packing strips interposed between said bars and the side walls of the receptacles.

7. A projectile of the character described, including a shell, comprising a body portion formed with a plurality of ports, and a head having detachable engagement with the body portion, the head having an opening extending longitudinally therethrough, a spring held plunger arranged in said opening and provided at its inner end with a head, a plurality of receptacles mounted within the body portion of the shell in spaced relation to each other, and adapted to contain gas producing chemicals, and a plurality of crushing bars encircling said receptacles within the shell, and formed with lugs extending inwardly and engaging the receptacles, as and for the purpose set forth.

8. A projectile of the character described, including a shell, a plurality of fragile receptacles mounted within the shell in spaced relation to each other, a plunger carried by the shell, and crushing means mounted within the shell and movable longitudinally thereof and provided with elements extending into the spaces between the receptacles and adapted to engage the respective receptacles for simultaneously breaking all of the receptacles upon the impact of the plunger with an object.

9. A projectile of the character described, including a shell, a plunger carried by the shell, a plurality of receptacles disposed within the shell and arranged in spaced re-

lation to each other, and a plurality of bars surrounding the receptacles between the latter and the interior wall of the shell and provided with lugs extending in between the receptacles, the lugs of some of said bars tending to hold the receptacles in position, and the lugs of the other bars being adapted to strike the receptacles and crush same upon the impact of the plunger with an object.

In testimony whereof I affix my signature in the presence of two witnesses.

FRANKLIN E. ARNDT.

Witnesses:

SAMUEL L. FERRALL,

DAVID C. BOYD.