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ADAPTER AND BOOSTER CASING FOR SHELLS.

APPLICATION FILED JULY 26, 1918.

1,296,170.

Patented Mar. 4, 1919.

3 SHEETS—SHEET 1.

Fig. 1.

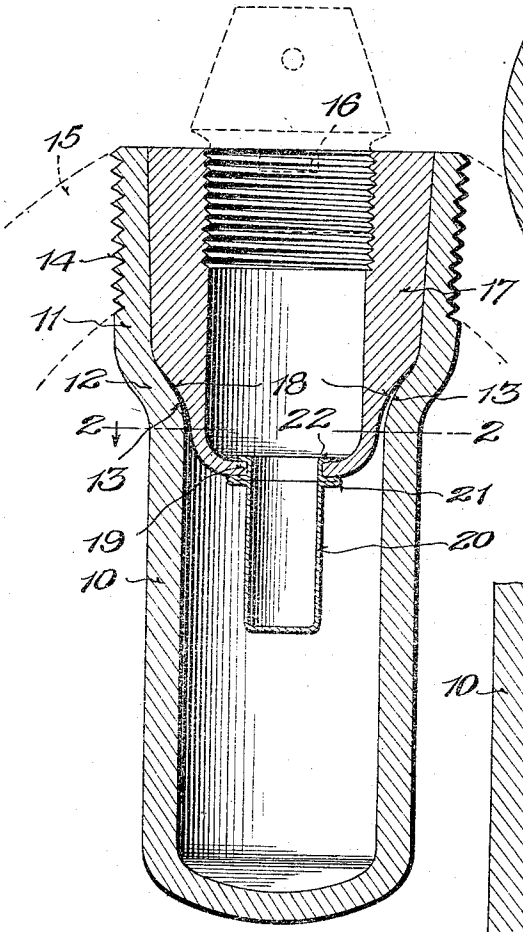


Fig. 2.

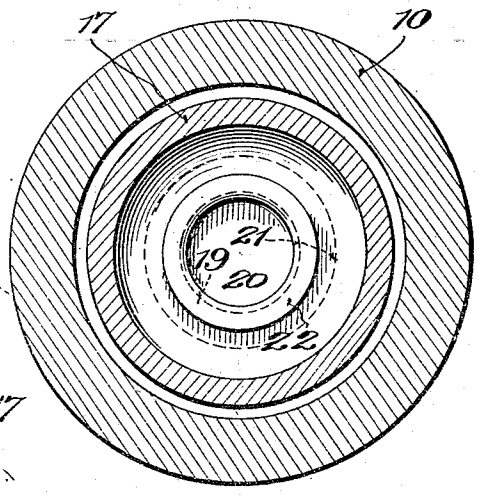
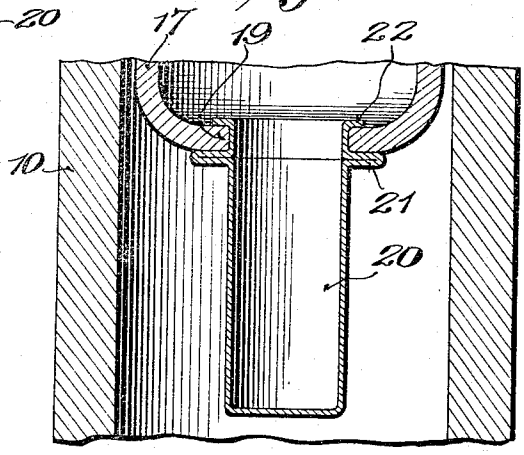


Fig. 3.



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3 SHEETS—SHEET 2.

Fig. 6.

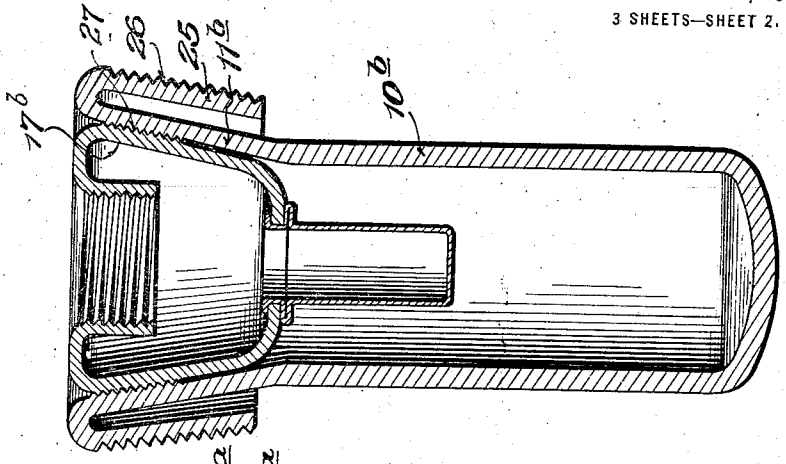


Fig. 5.

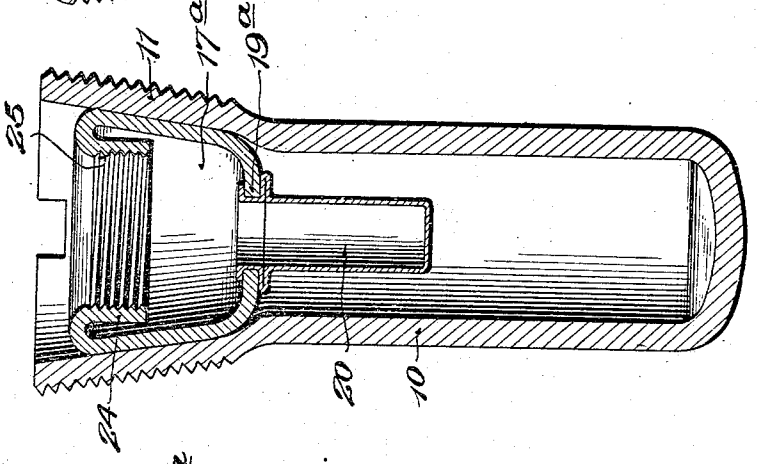
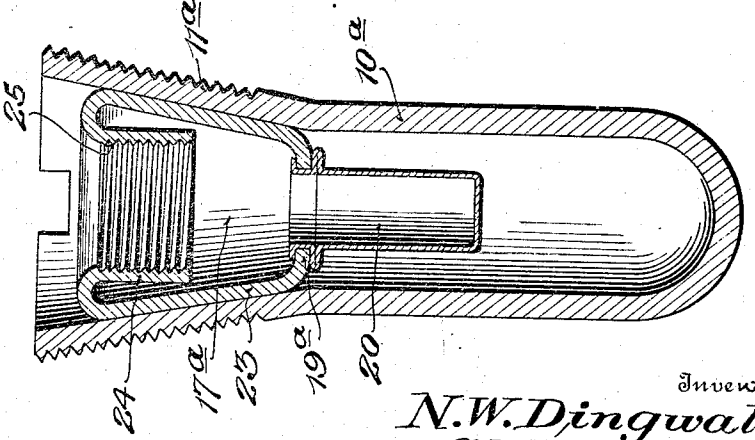


Fig. 4.



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3 SHEETS—SHEET 3.

Fig. 9.

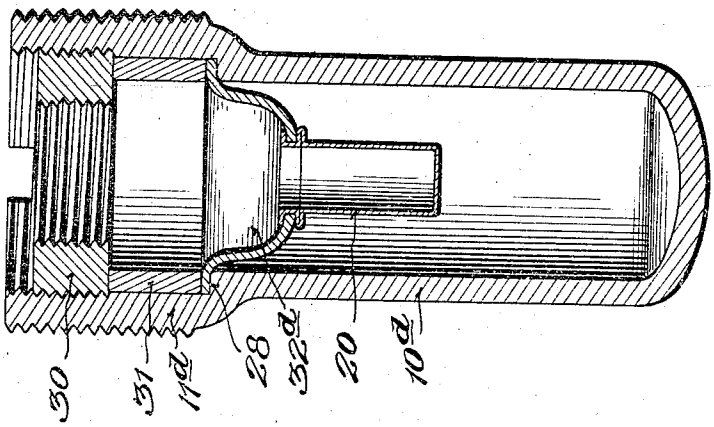


Fig. 8.

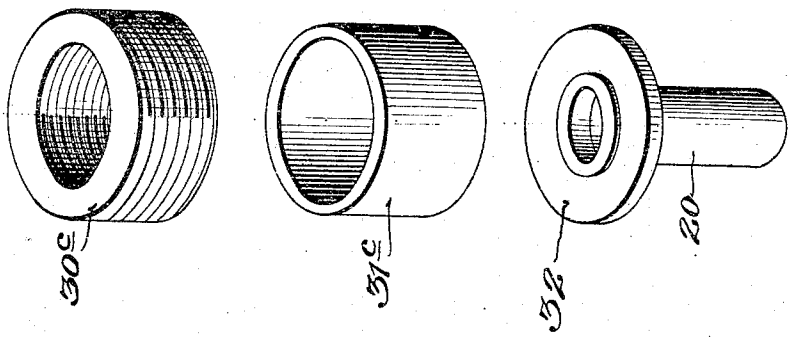
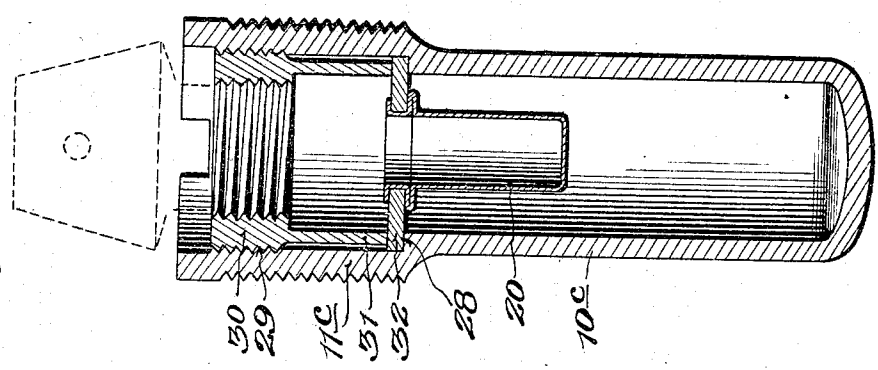


Fig. 7.



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UNITED STATES PATENT OFFICE.

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ADAPTER AND BOOSTER CASING FOR SHELLS.

1,296,170. Specification of Letters Patent. Patented Mar. 4, 1919.

Application filed July 26, 1918. Serial No. 246,897.

To all whom it may concern:

Be it known that we, NELSON W. DINGWALL and CLIFFORD M. BUDD, citizens of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Adapter and Booster Casings for Shells, of which the following is a specification.

This invention relates to an adapter and booster casing for shells and projectiles, and has as its purpose to provide a structure which is greatly simplified so that the cost of manufacture is very substantially reduced.

In accordance with our invention, the adapter head and booster casing are made by drawing a sheet of metal into substantially final form thereby doing away with the time and expense of carrying out various operations in machining the parts from bar stock or forgings and joining the parts together.

Since the adapter head and booster casing are integral, no joints are provided therebetween through which gas might leak from the shell into the interior of the booster casing, and this is of particular advantage, as it has been found that where the adapter and booster casing are made separately and then joined together, the gas of a gas shell will leak through the joint into the adapter head and then pass from the head and constitute a source of danger to persons handling the shell.

In the accompanying drawings, we have illustrated several embodiments of our invention, but it is to be understood that the present disclosure is illustrative only and is not restrictive of our invention and that it is susceptible of various changes which would be within the spirit of our conception without departing from the scope of the appended claims.

In said drawing,

Figure 1 is a longitudinal sectional view of one embodiment of our improved adapter and booster casing.

Fig. 2 is a sectional view taken on a line 2—2 of Fig. 1.

Fig. 3 is a sectional view on an enlarged scale showing the manner of connecting the fuse socket to the fuse socket holder.

Figs. 4, 5 and 6 are views similar to Fig. 1, but show different embodiments of our invention.

Fig. 7 is a view similar to Fig. 1 but illustrates another form of our invention.

Fig. 8 is a perspective view of certain parts which may be used in the adapter head and casing shown in Fig. 7.

Fig. 9 is a longitudinal sectional view of still another form of our invention.

In the drawings, like reference characters designate like parts in the several views. Referring to that embodiment of our invention disclosed in Figs. 1 to 3, inclusive, 10 designates the booster casing having a chamber which receives the booster charge and 11 designates the adapter head. The adapter head and the booster casing are integral with each other and are preferably formed from a single sheet of metal drawn to the shape illustrated, so that the cost of manufacture is relatively low, and no joints between the booster casing and the adapter are presented through which gas may pass. The head 11 is of greater diameter than the booster casing and the opening through the head 11 gradually increases in diameter toward its outer end so that this opening tapers slightly. Between the head 11 and the casing 10, the walls are abruptly inclined, as at 12, forming an internal slanting shoulder 13. The head 11 is externally threaded for a portion of its length, as at 14, so that it may be screwed into the threaded opening in the nose of the projectile 15 which, for illustrative purposes, is shown in dotted lines. The threaded portion 14, preferably, will be tapered in the event the adapter is to be used in connection with a shell containing gas, but it may be straight, if desired. In the outer end of the adapter head 11 are recesses 16 adapted to receive a spanner wrench when the head 11 is to be screwed into place.

Fitting within the adapter head 11 is the bushing 17, which takes the place of the usual fuse bushing and fuse socket holder, which parts are now generally made in two pieces. The bushing 17, which is circular in cross-section, tapers inwardly slightly toward its inner end so that it is frusto conical and corresponds in slope to the opening in the adjuster head 11. Adjacent the lower end of the bushing 17 the external surface is reduced and abruptly inclined as at 18. The inclination of the surface 18 is more pronounced than the shoulder 13 of the portion 12 so that there is sufficient clearance

therebetween to permit the bushing 17 to be tightly wedged in place in the adapter head without bringing these surfaces into engagement. The inner end of the bushing 17 is bent radially inward to form an internal lip or flange 19, to which is connected the fuse socket 20 adapted to receive the detonating charge.

The fuse socket 20 is made of sheet metal pressed to the form of a thimble. Spaced a slight distance from the open end of the socket is a flange 21 formed by spinning the wall of the socket outwardly so as to fold the spun out portion upon itself. To secure the fuse socket in place on the bushing 17, the open end of the socket is inserted within the lip 19 until the flange 21 engages the lower surface of the lip and then the metal about the open end of the socket is bent outwardly to form a flange 22 which engages the upper surface of the lip 19.

It will be seen from the above description of the embodiment of the invention shown in Figs. 1 to 3, that the number of separate parts is reduced to a minimum and each of these parts requires but a relatively few operations in their manufacture. The parts may be readily assembled, it being only necessary, after the fuse socket 20 is connected to the bushing 17, to insert the bushing into the head 11 and then press or drive it into place. Due to the wedging fit between the head and bushing a gas-tight joint is provided therebetween.

In the embodiment of the invention shown in Fig. 4, the adapter head 11^a and the booster casing 10^a are, as in the preceding embodiment, formed from a single sheet of metal drawn to the shape illustrated, but in this instance the head tapers directly and gradually from the booster casing, the abruptly inclined portion 12 of the preceding embodiment being omitted.

The bushing 17^a of Fig. 4 is made from a single piece of metal by drawing the same to the proper shape. The formed bushing 17^a has a body portion 23 which tapers so as to fit snugly within the head 11^a and at its lower end the bushing is bent radially and inwardly to provide a flange 19^a, to which the fuse socket 20 is secured. At the upper or outer end of the body portion 23 the walls of the bushing are bent over and then extend inwardly of the body portion to form a cylindrical sleeve 24, which is concentric to the longitudinal center of the head and this sleeve is internally threaded as at 25 so as to receive the complementary screw threads on the nipple of the fuse body, such as is shown in dotted lines in Fig. 1.

In the embodiment shown in Fig. 5, the booster casing 10 and the head 11 are almost identical to the booster casing and adapter shown in Fig. 1, and the bushing 17^a is similar in construction to that shown in Fig. 4. In Fig. 5, parts of the booster casing and adapter head are designated by the same numerals as those employed to indicate like parts in Fig. 1, and the parts of the bushing 17^a are designated by the same numerals as the bushing in Fig. 4.

In the embodiment shown in Fig. 6 the head has a tapering body portion 11^b and a skirt 25 surrounding the portion 11^b, and the skirt is externally threaded as at 26 so that the adapter may be screwed into the threaded opening in the nose of the bullet. The bushing 17^b is similar to the bushing 17^a, as shown in the two next preceding embodiments, but in this instance the tapering opening of the head 11^b and the bushing 17^b are provided with complementary screw-threads 27, so that the bushing is screwed into the head. The threads 27 terminate short of the lower end of the bushing so that the lower end of the bushing has a wedgelike fit in the adapter head.

In that embodiment of our invention shown in Fig. 7, the booster casing 10^c and the adapter head 11^c are formed from a single sheet of metal drawn to the shape illustrated, but in this instance there is a sharp internal shoulder 28 between the head and casing, and the opening through the head is not tapered, but is of like diameter throughout its length. The opening through the head, at its outer end, is threaded as at 29, so as to receive in threaded engagement a bushing 30 which carries a sleeve 31, which sleeve, in this embodiment, is integral with the bushing. The bushing 30 is internally threaded so as to receive the fuse body shown in dotted lines.

Resting upon the shoulder 28 is a centrally apertured washer or disk 32, to which the fuse socket 20 is secured in the same manner as in the preceding embodiments.

To assemble the parts shown in Fig. 7, the booster casing 10^c is charged with a suitable explosive and then the washer 32, carrying the fuse socket 20, is inserted in the head and rests upon the shoulder 28. The bushing and sleeve are then screwed into place.

In Fig. 8 the bushing 30^c is independent of the sleeve 31^c. It is, of course, evident that the bushing and sleeve may be made integral, as shown in Fig. 7, or separately, as shown in Fig. 8.

The structure shown in Fig. 9 resembles, in some respects, the structure shown in Fig. 1, and in others the structure shown in Fig. 7. In this instance, a shoulder 28 is formed between the head 11^d and the booster casing 10^d, and the opening through the head is not tapered. Instead of making the fuse socket holder and bushing integral, as shown in Fig. 1, a separate bushing 30, a sleeve 31, and a socket carrying member 32^d are pro-

vided. The shape of the socket carrying member 32^a is similar to the lower portion of the bushing 17, of Fig. 1. It is, of course, evident that in Fig. 1 the bushing 17 may be divided into three parts, corresponding to parts 30, 31, and 32^a of Fig. 9.

It will be noted that in each embodiment of our invention the adapter head and booster casing are made integral with each other and are preferably formed by drawing a sheet of metal to the desired shape.

What we claim is:

1. In combination, a booster casing, and an adapter head having a tapering opening, said booster casing and head being formed by drawing a single sheet of metal to the proper shape.

2. In combination, a booster casing and an adapter head formed integrally with each other, said head having an interior tapering surface, a bushing for receiving a fuse nipple resting on said surface within said head, and a fuse socket carried by said bushing.

3. In combination, a booster casing, an adapter head having a tapering opening, and a tapering bushing in said opening.

4. In combination, a booster casing having an integral tapering portion at its open end, and a tapering bushing in and making wedging contact with said tapering portion.

5. In combination, a booster casing, an adapter head having a tapering opening, said head and casing being drawn from a single sheet of metal, and a tapering bushing wedged in the opening of said head.

6. In combination, a booster casing, an adapter head formed integrally with said casing and having a tapering opening and a tapering bushing fitting in said head and having internal threads for receiving the nipple of a fuse body and also having a flange for the reception of a fuse socket.

7. In combination, a booster casing and an adapter head formed integrally with each other, the opening in the head being slightly tapered and the walls of the head where it joints the booster casing being abruptly inclined, and a bushing slightly tapered to fit snugly in the head and having a reduced portion inclined at a more abrupt angle than the inclined portion of the head so as to prevent engagement therebetween.

8. In combination, a booster casing and an adapter head formed integrally with each other, the opening in the head being slightly tapered, an abruptly inclined portion between the head and casing, a tapering bushing having a reduced portion inclined at a more abrupt angle than the inclined portion so as to prevent engagement therebetween, said bushing being internally threaded at its outer end and having an internal lip or flange at its lower end, and a fuse socket connected to said lip.

9. In combination, an adapter head having a tapering opening, and a bushing having a body portion tapered to correspond to said opening so as to be received snugly thereby, said bushing having at its lower end a flange and at its outer end a cylindrical projection directed backwardly into the body portion, said projection being internally threaded to receive the nipple of a fuse body.

10. In combination, a booster casing and an adapter head formed from a single sheet of metal, said head having a body portion and a skirt bent backwardly about the body portion.

11. In combination, a booster casing and an adapter head formed integrally from a single sheet of metal, said head having a tapering body portion and an externally threaded skirt portion surrounding the body portion.

12. In combination, a booster casing and an adapter head formed from a single sheet of metal, said head having an internally threaded body portion and an externally threaded skirt portion, and a bushing screwed into said body portion.

In testimony whereof we have hereunto set our hands.

NELSON W. DINGWALL.
CLIFFORD M. BUDD.

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