N. W. DINGWALL & C. M. BUDD.

ADAPTER AND BOOSTER CASING FOR SHELLS.

APPLICATION FILED JULY 26, 1918.

1,296,171.

Patented Mar. 4, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

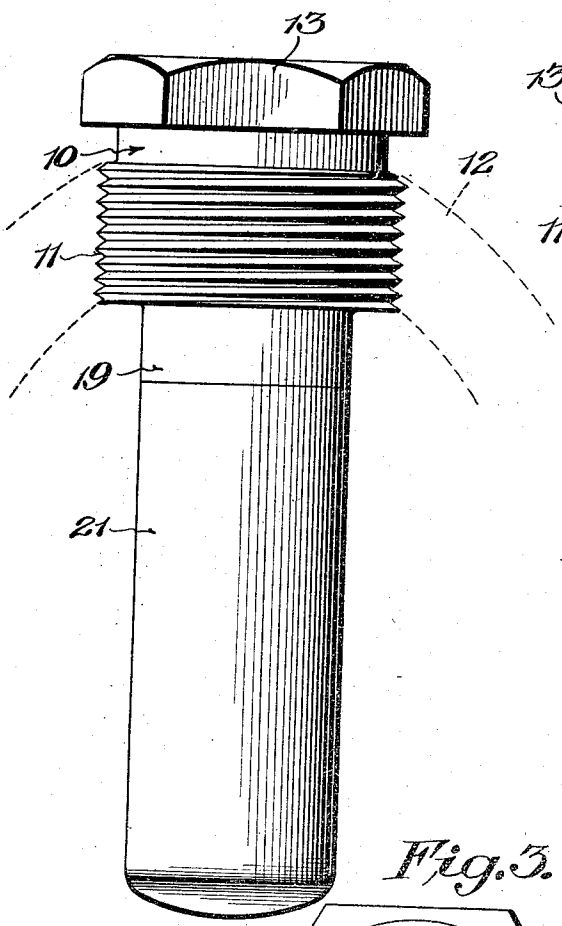


Fig. 2.

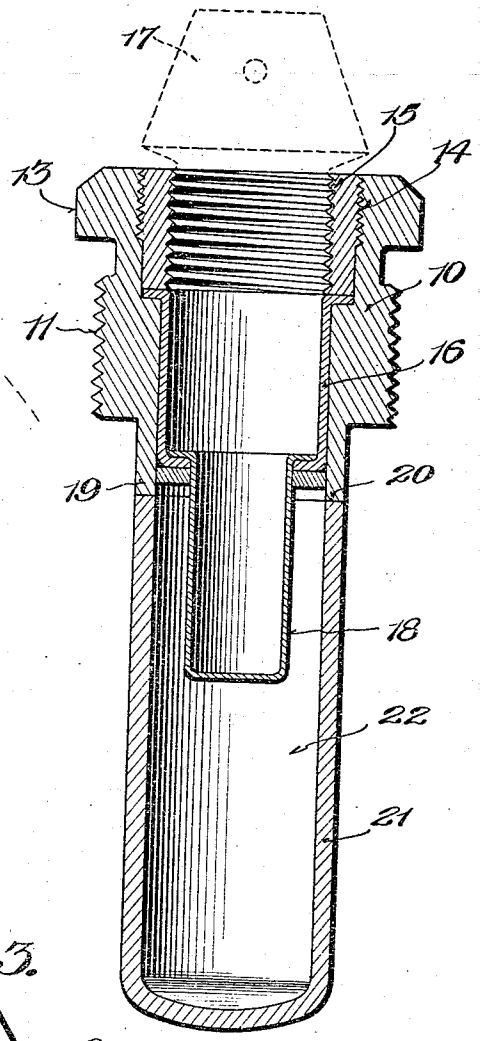
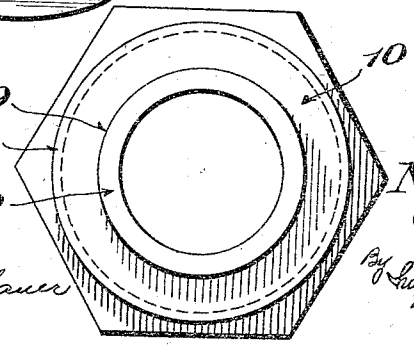


Fig. 3.



Witness

Chas. L. Griesbauer

Inventors

N. W. Dingwall,

C. M. Budd,

By Lumen Cushman & Rea

Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

N. W. DINGWALL & C. M. BUDD.

ADAPTER AND BOOSTER CASING FOR SHELLS.

APPLICATION FILED JULY 26, 1918.

1,296,171.

Patented Mar. 4, 1919.

2 SHEETS—SHEET 2.

Fig. 4.

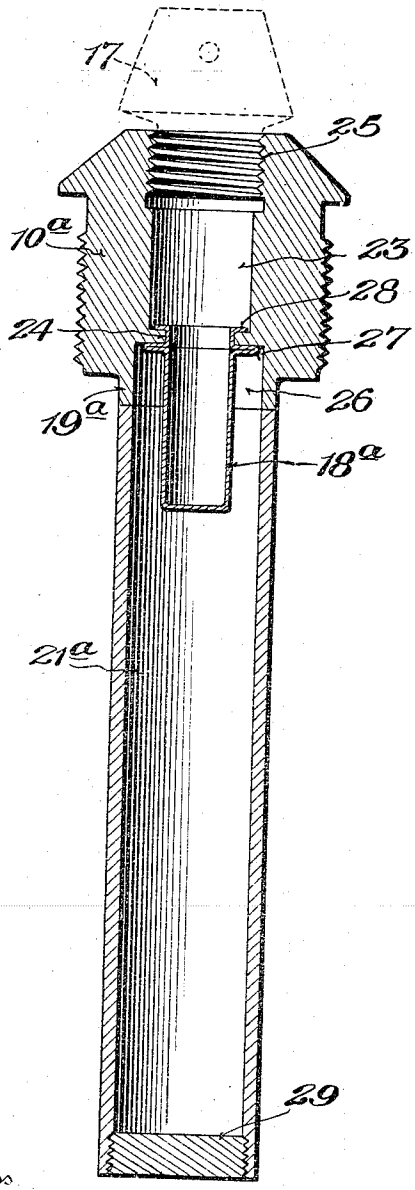
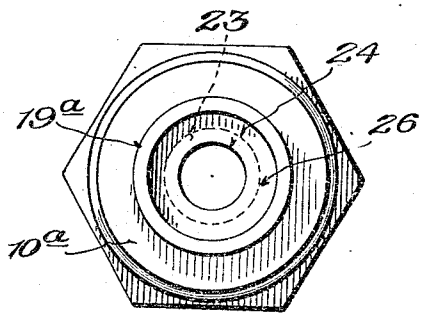


Fig. 5.



Witness

Chas. L. Griesbauer

Inventors

N. W. Dingwall,

C. M. Budd,

By Lyons, Cartmell & Lea

Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

NELSON W. DINGWALL AND CLIFFORD M. BUDD, OF NEW YORK, N. Y.

ADAPTER AND BOOSTER CASING FOR SHELLS.

1,296,171. Specification of Letters Patent. **Patented Mar. 4, 1919.**

Application filed July 26, 1918. Serial No. 246,898.

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 projectiles or shells, and has as its object to provide an adapter and booster casing which may be joined together by butt-welding so as to obtain a gas-tight joint therebetween and also to reduce the number of different operations required to make the joint, thus materially cutting down the cost of production.

In accordance with the present specifications of the United States Government, the adapter and booster casing are made separately, the booster casing having formed at one end a cylindrical flange which fits in an annular groove in the end of the adapter, and the adapter has a skirt or annular fin outside of the groove, and this skirt is swaged or spun about the flange of the casing in order to secure the parts together. This construction is open to the objection that it requires a relatively large number of operations to form the joint, and the cost of manufacture is relatively high because thereof. Furthermore, a joint of this old type is not absolutely gas-tight, so that, where used in connection with gas shells, the gas not infrequently will seep through the joint and into the booster casing and then escape from the casing and constitute a source of danger to persons handling the shell.

In an adapter and booster casing made in accordance with the present invention, the time, the expense and waste in forming, machining and finishing a fin and groove on the adapter and forming a flange on the booster casing are eliminated; the structure is greatly simplified; and the joint is easily and cheaply made.

In order that others skilled in the art may readily understand our invention, we have illustrated in the accompanying drawings two embodiments thereof, but it will be understood that our invention is not restricted to the specific embodiments disclosed.

In said drawings:

Figure 1 is an elevational view of one embodiment of our improved adapter and booster casing.

Fig. 2 is a longitudinal sectional view thereof.

Fig. 3 is a plan view of the lower end of the adapter shown in Fig. 1 before the casing is secured thereto.

Fig. 4 is a view similar to Fig. 2, but illustrates a slightly different construction.

Fig. 5 is a bottom plan view of the head shown in Fig. 4.

Referring to that embodiment of our invention illustrated in Figs. 1 to 3, inclusive, of the drawings, 10 designates an adapter head, having, as is usual, an externally threaded portion 11, so that the adapter may be screwed into the opening in the nose of the shell 12, a portion of the shell being shown by dotted lines in Fig. 1. The outer end of the adapter head is polygonal in cross section, so as to provide wrench receiving faces 13. The adapter head has a through bore which is counterbored in its outer end, and the outer end of this counter bore is internally screw threaded, as at 14, so as to receive a bushing 15, which bushing clamps the usual fuse holder 16 in place, as shown in Fig. 2 of the drawings. The bushing 15 is internally threaded so as to receive the threaded nipple of the fuse body 17, which fuse body is shown conventionally by dotted lines in Fig. 2 as it can be of any suitable or well known construction. The socket holder 16 carries at its lower end the fuse socket 18 containing a detonating charge. The structure above described is similar to that now usually employed in the manufacture of adapters for projectiles or shells made for the United States Government and we make no claim of novelty relating thereto.

Formed integrally with and extending from the inner end of the head 10 of the adapter is an annular or cylindrical skirt or lip 19, and this lip is, preferably, devoid of shoulders and the like, and the end surface of the lip is plain, so as to provide a flat, annular face, designated by the numeral 20 in Fig 3.

The booster casing 21 comprises a cylindrically shaped body closed at one end and having a chamber 22 for the reception of the booster charge, such as a charge of trinitrotoluol. The internal and external diameters of the cylindrical casing 21 are similar to the internal and external diameters, respectively, of the skirt 19, and the end face of

the casing 21 is flat, so that when the casing and skirt 19 are placed end to end, the abutting faces will lie flat against each other and the skirt and the casing will form, substantially, a single cylinder.

After the parts, shown in Figs. 1 to 3, inclusive, are formed in the manner above described, the skirt of the adapter and the booster casing are placed end to end and welded together so as to form a seamless welded joint therebetween. The welding operation may be carried out in any suitable or well known type of welding apparatus.

In that embodiment of our invention shown in Figs. 4 and 5, the adapter head 10^a has a lip or skirt 19^a to which the booster casing 21^a is welded, as in the preceding embodiment, but in this instance the head 10^a is of different construction in that the opening therethrough is counterbored at its opposite ends, and at the lower end of the outer counterbore 23 is a flange 24 to which the fuse socket 18^a is directly secured. The counterbore 23 is threaded at its outer end, as at 25, so as to directly receive the nipple of a fuse body 17, shown in dotted lines in Fig. 4. By counterboring the lower end of the adapter 10^a, as at 26, the lip or skirt 19^a is of the same internal diameter as the chamber of the booster casing.

The fuse socket 18^a has spaced slightly from its open end a fold or external flange 27 engaging the under surface of the flange 24, and after inserting the open end of the socket in the opening through the flange 24, the outer end of the socket is bent outwardly to form a flange 28, which is pressed against the outer surface of the flange 24.

It will be understood that the socket 18^a is secured to the flange 24 before the welding operation for securing the casing 21^a to the skirt 19^a takes place. To fill the booster casing with an explosive, which constitutes the booster charge, the lower end of the casing is open until the casing is charged, and is then closed by means of a plug 29.

It will be noted that a structure constructed in accordance with the present invention has a gas-tight joint between the adapter and the booster casing, so that there is no danger of the gas from the interior of the shell escaping into the booster casing. Furthermore, the lip 19 or 19^a can be easily machined at the same time as the remaining portion of the adapter head is being machined, and of course, since this skirt is merely a cylindrical projection, expensive or complicated machinery, experienced workmanship, waste of materials, time expended in carrying out several successive operations thereon, and waste of labor are eliminated or greatly reduced. The skirt 19 or 19^a may be cheaply and quickly formed, thus increasing the rate of production, while decreasing the cost of manufacture, and these points are of great consideration in the manufacture of shells because of the colossal scale on which shells are now used in modern warfare. The cost of preparing the booster casing so that it may be connected to the skirt 19 or 19^a is substantially negligible, it being only necessary to machine the outer end of the casing so as to provide a flat surface. The welding operation may be carried out in machines now adapted for that purpose, so that the designing of new machinery for manufacturing our device is not necessary.

It is, of course, understood that our invention is susceptible of various modifications and changes which would be within the spirit of the invention without departing from the scope of the following claims.

What we claim is:

1. In combination, an adapter head having a through opening, an internal flange, and a depending skirt; a fuse socket secured directly to said flange; and a booster casing secured to said skirt by means of a seamless welded joint.

2. In combination, an adapter head having a through opening counterbored at its lower end, an integral internal flange; and a skirt provided with a flat end surface; a fuse socket connected directly to said flange; and a booster casing having a flat end surface of the same size and configuration as the end surface of said skirt, said skirt and casing being secured together by means of a seamless welded joint.

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."