L. P. BARLOW.

BOOSTER CONSTRUCTION FOR EXPLOSIVE DEVICES.

APPLICATION FILED OCT. 6, 1917.

1,317,610.

Patented Sept. 30, 1919.

Fig. 1.

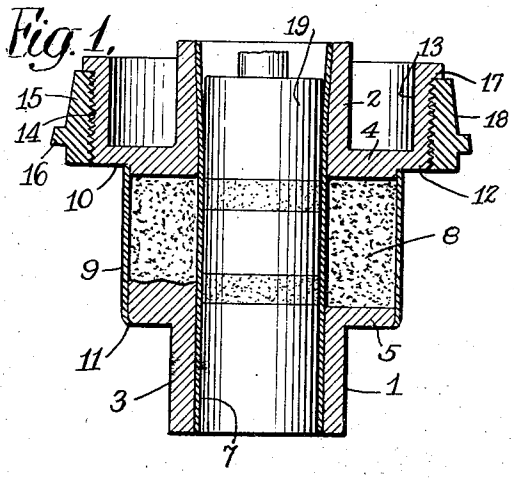


Fig. 2.

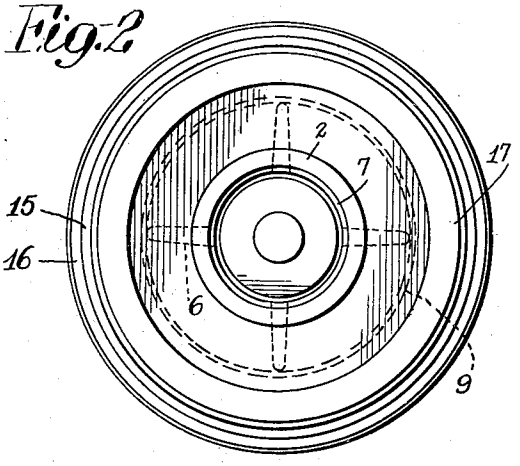


Fig. 3.

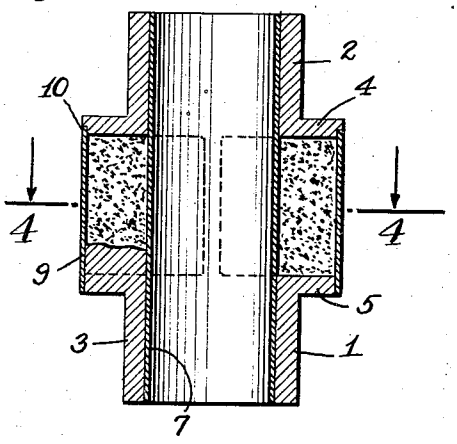
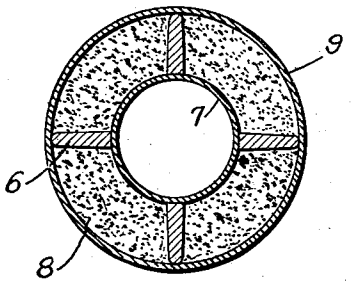


Fig. 4.



INVENTOR

Lester P. Barlow

BY

J. C. Edmunds

ATTORNEY

UNITED STATES PATENT OFFICE.

LESTER P. BARLOW, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO MARLIN-ROCKWELL CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

BOOSTER CONSTRUCTION FOR EXPLOSIVE DEVICES.

1,317,610. Specification of Letters Patent. Patented Sept. 30, 1919.

Application filed October 6, 1917. Serial No. 195,187.

To all whom it may concern:

Be it known that I, LESTER P. BARLOW, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Booster Construction for Explosive Devices, of which the following is a specification.

My invention relates to an improved booster construction adapted for use in various forms of explosive shell in which the booster charge of explosive material is to be fired by the explosion of a detonator, and is in turn to detonate the main explosive charge of the shell. Also, in the preferred form of my device, the booster frame is so formed as to serve as a diaphragm or closure member for closing the end of the main explosive chamber of the shell, or the booster frame is secured to another member for the purpose of jointly effecting a closure of the explosive chamber. The improved device may be used, for example, in the construction of drop bombs or the like in which a detonator, normally held at a distance from the explosive chamber, is caused to move into the interior of the booster within the explosive chamber after the bomb or shell has been dropped or launched and has armed itself.

The object of my invention is to improve the construction of such devices in order that the same may be more economically and efficiently manufactured and assembled and to render the same more effective in operation.

In my construction, an integral frame, preferably a casting, is provided having annular portions separated vertically and connected together by radially or outwardly extending ribs. A tube is inserted within the bore of this frame to provide an inner closure for the pockets or spaces between the ribs and to form a means for guiding the detonator into its firing position. The pockets between the ribs being filled with detonating material, the pockets are closed on their peripheries by an outer tube fitted around the frame. The upper portion of the frame may be extended laterally to form a complete closure, together with the main frame of the booster, and be adapted to extend entirely across the interior of the shell to separate the main explosive chamber of the shell from the portion beyond the same in which the detonator is normally maintained. This annular extension of the frame may also be provided with a flange or with other means for securing the same to the casing of the shell, so as to mount the booster in position.

In order that a clearer understanding of my invention may be had, attention is hereby directed to the accompanying drawings forming part of this application and illustrating certain embodiments of my invention. In the drawings Figure 1 represents a central longitudinal section, broken away, through one form of booster embodying my invention, Fig. 2 is a top plan view of the same, Fig. 3 is a central longitudinal section through a modified form of booster and Fig. 4 is a cross-section taken on line 4—4 of Fig. 3.

Referring to the drawings, a main frame 1, preferably a metallic casting, is employed having upper and lower tubular portions 2 and 3 which are provided at their lower and upper ends, respectively, with outwardly extending annular portions 4 and 5. These latter are connected by a plurality of outwardly extending vertical ribs 6, which are spaced around the periphery of the structure and preferably extend radially. By this means, a strong skeleton frame is provided which may be easily cast and which affords pockets or spaces between the ribs 6 for the reception of the detonating charge. A thin tube 7 of brass or other suitable material is fitted within the bore of the frame to have close contact with the inner surface of the tubular portions 2 and 3 of the frame and to rest against the inner edges of the ribs 6.

The spaces between the ribs, the horizontal surfaces 4 and 5 and the tube 7 may then be filled with a high explosive 8 such as tri-nitro-toluol, and the outer tube 9 fitted around the frame to contact the outer edges of rib 6 and the periphery of the lower annular portion 5 of the frame. The upper edge of tube 9 preferably abuts against a shoulder 10 formed on the upper horizontal portion 4 of the frame, and tube 9 may conveniently be secured in position by peening its lower edge about the lower edge of horizontal portion 5 of the frame, shown at 11.

In the preferred form of my device, the

upper outwardly extending portion 4 of the frame is extended outwardly beyond tube 9 to form an annular extension 12. This extension may be secured to the outer casing of the bomb or other explosive shell in which the booster is adapted to be used to form, together with the main frame of the booster, a complete closure or diaphragm for the shell. Preferably, the annular extension 12 is provided with an upwardly extending annular edge portion 13 which may be provided with a peripheral screw-thread 14. An internally threaded ring 15 may be screwed onto the annular portion 13 of the frame and provided with an outwardly extending peripheral flange 16, adapted to be inserted within the casing of the bomb or other explosive shell, for the purpose of completing the closure and supporting the structure in position. Annular extension 13 may be provided with an outwardly extending annular flange 17 which rests upon the outer surface of ring 15 when the latter is screwed into position. With this construction, the main frame is formed to a standard size and rings, such as 15, machined to fit desired shells, the outer surface 18 of ring 15 being given a proper slant or configuration to rest in contact with the inner surface of the casing in which the device is mounted.

A detonator 19 is partly illustrated as mounted in firing position within the inner tube 7 of the booster. Tube 7 may be closed at the bottom by an appropriate plug carrying a firing pin to explode the detonator, or in some cases the tube 7, or a continuation thereof, may continue through the bomb or shell to the forward end thereof, in which case means would be provided for stopping or holding the detonator in its firing position. In any case, there should, of course, be no connection between the interior of tube 7 and the explosive chamber in which the booster is mounted.

The structure illustrated in Figs. 3 and 4 is the same as that shown in Figs. 1 and 2, except that the extension of the upper annular portion 4 and ring 15 are not included in the structure which is intended for use merely as a booster to be held in position by some means other than that shown in Fig. 1, as, for example, by securing the frame 1 to tube 7 which may be secured in place in the shell.

In operation the charge carried by a detonator such as 19 is fired when the detonating charge is in alinement with the booster charge 8, so that the thin tube 7 separating the detonating charge from the booster charge is shattered, the booster charge 8 fired, and the main explosive charge surrounding the tube 9 fired in turn. The metal in annular portions 4 and 5 of the booster frame should be sufficiently massive to resist rupture when the booster charge is exploded, so that the full force of the latter is directed outwardly into the surrounding main charge of high explosive. The closure effected by portions 4, 12 and 15 of the form of the device shown in Fig. 1 should also be sufficiently strong to resist rupture in case the detonator should be accidentally exploded when held in its normal position above the booster, it being understood that the main explosive chamber of the shell or bomb in which the construction is used is supposed to be bounded at its upper edge by the lower surface of extension 12 and ring 15, as is shown, for example, in my application "Contact bombs," Serial No. 195,609, filed October 9, 1917.

It should be understood that my invention is not limited strictly to the exact details of construction described, but is as broad as is indicated by the accompanying claims.

What I claim is:—

1. A booster construction for explosive shells, comprising a frame having upper and lower tubular portions with annular portions extending outwardly from the lower and upper ends respectively of said upper and lower portions, and radial ribs extending between said annular portions, and tubular members fitted around and within said ribs.

2. A booster construction for explosive shells, comprising a skeleton frame having upper and lower portions extending outwardly from a cylindrical bore, and peripherally spaced ribs extending between said portions, and means for retaining an explosive charge within the spaces between said ribs.

3. A booster construction for explosive shells, comprising a skeleton frame having upper and lower portions extending outwardly from a cylindrical bore, and peripherally spaced ribs extending between said portions, a tube fitted within the bore of the frame, and a closure extending around the outer edges of said ribs, one of said outwardly extending portions being constructed for attachment to the casing of the shell.

4. A booster construction for explosive shells, comprising a skeleton frame having upper and lower portions extending outwardly from a cylindrical bore, and peripherally spaced ribs extending between said portions, and a closure for the outer sides of the spaces between said ribs, and an annular extension for one of said outwardly extending portions, adapted, with said booster frame, to form a closure across the casing of a shell in which it is mounted.

5. A booster construction for explosive shells, comprising a skeleton frame having upper and lower portions extending outwardly from a cylindrical bore, with pockets

for a booster charge between said portions, one of said outwardly extending portions having an extension with a peripheral flange adapted, with said booster frame, to form a closure across the casing of a shell in which it is mounted.

6. A booster construction for explosive shells, comprising a skeleton frame having upper and lower portions extending outwardly from a cylindrical bore, and peripherally spaced ribs extending between said portions, and a closure for the outer sides of the spaces between said ribs, said upper portion extending outwardly beyond said closure, and having a screw-threaded periphery, and a ring screwed on said periphery, and having an outwardly extending annular flange, adapted to be inserted in the outer casing of a shell in which the device may be mounted.

This specification signed and witnessed this 2d day of October, 1917.

LESTER P. BARLOW.

Witnesses:
DYER SMITH,
I. MCINTOSH.