Nov. 12, 1946. C. B. FERREL 2,410,932

BOMB

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Fig. 1

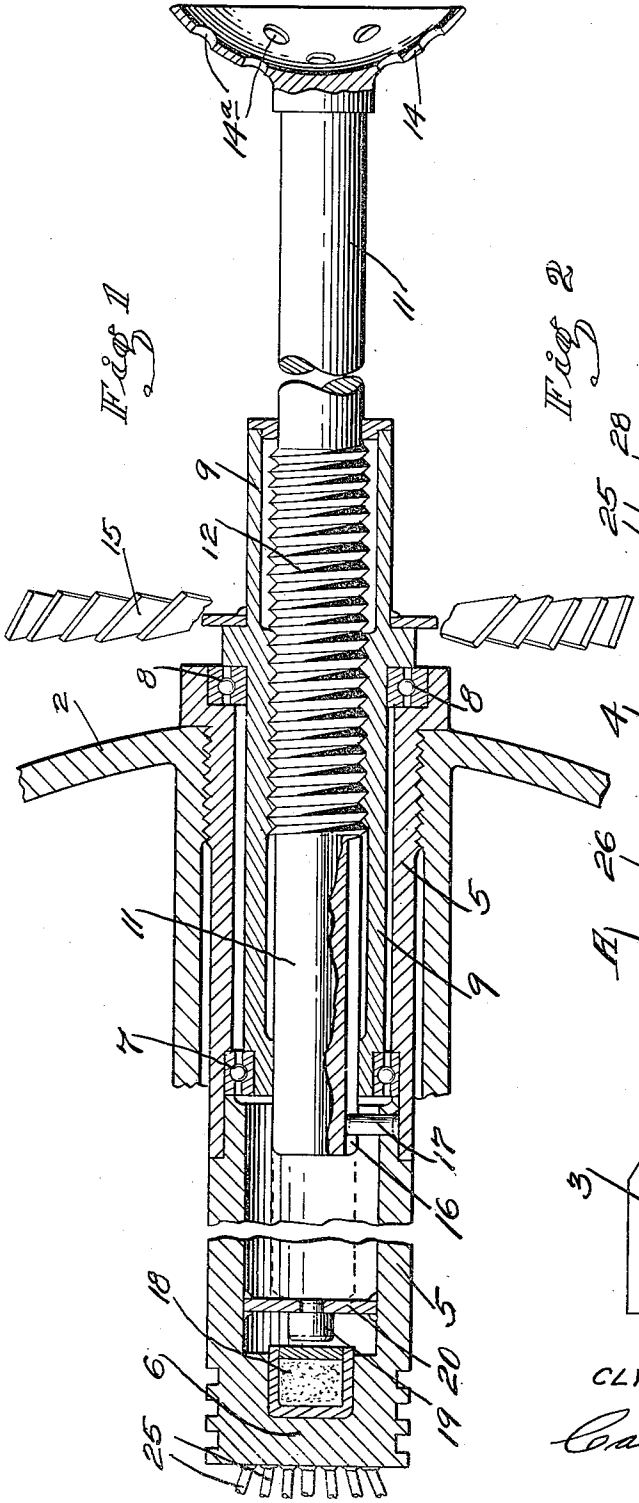
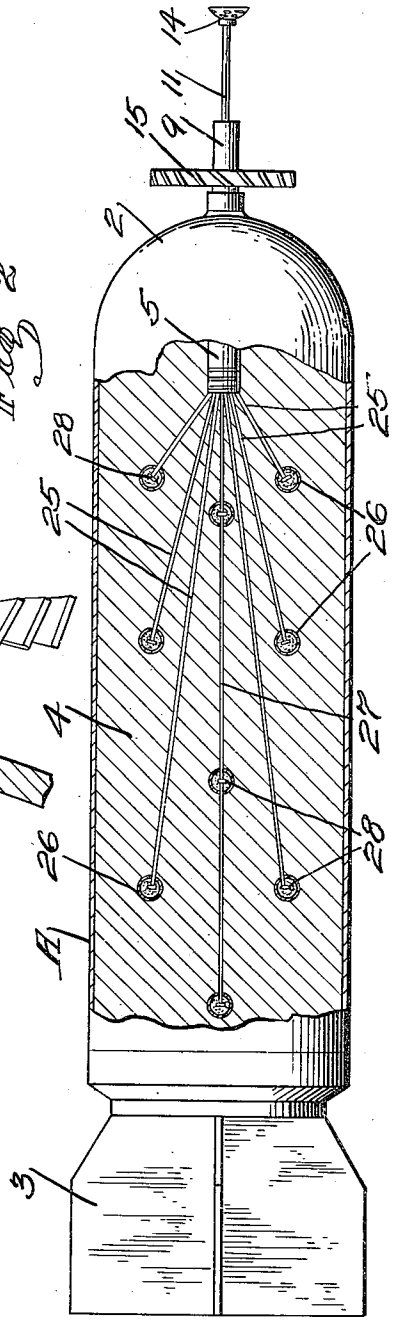


Fig. 2



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1 Claim. (Cl. 102—2)

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This invention relates to a bomb, and especially to means for detonating large bombs.

Present experience has proved that large bombs, that is, bombs that are loaded with an explosive charge of one thousand pounds up to several tons and now known as block busters, do not always explode or detonate with 100% efficiency; that is, large bombs are usually detonated at the end of impact and as the body of explosive or detonating charge is so large, there is a tendency for the charge to burst into fragments which scatter outwardly over a large area with the result that only a portion of the charge is actually detonated. In other instances the larger bombs tend to bury themselves before detonation can take place with the result that even though the entire charge is detonated, the damage resulting is comparatively small as a crater is formed which directs the force of the explosive upwardly rather than laterally.

The object of the present invention is to provide means for detonating a large bomb at a plurality of points throughout the body of the charge, and simultaneously, so as to insure instantaneous explosion of the entire charge; and further, to provide means for preventing burial of the bomb before detonation takes place.

The bomb is shown by way of illustration in the accompanying drawing, in which:

Fig. 1 is an enlarged longitudinal section of the detonating rod-releasing mechanism; and

Fig. 2 is a side elevation of a bomb, partially in section.

Referring to the drawing in detail, and particularly Fig. 2, A indicates the outer shell of a bomb, 2 the nose, 3 the tail, and 4 the explosive charge contained within the shell.

Secured in the nose and extending a suitable distance into the body of a shell is a tube 5 which is closed at the inner end by an anvil block 6. Disposed within the tube are a pair of spaced ball bearings 7 and 8, and journalled in said bearings is a second tube 9. A portion of the inner surface of this tube is threaded to form a nut, and extending into this tube is a rod 11, a portion of which is externally threaded, as indicated at 12, to engage the nut. Rod 11 functions as a detonating rod and extends in front of the nose of the bomb a distance of three or four feet or more. A cup 14 is secured to the outer end of the rod, and will serve a purpose hereinafter to be described.

Tube 9, together with a nut 10 formed therein, is designed to rotate and feed rod 11 inwardly while the bomb is in flight. A multiblade propeller 15 is accordingly secured to the front end of the tube 9 to function in the usual manner, and as

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tube 9 is rotated, rod 11 must be held against rotation if it is to be fed inwardly by the nut, and this is accomplished by providing a spline 16 and a pin 17.

Formed in the anvil block 6 in direct alignment with the detonating rod 11 is a recess which is provided for the reception of a primer 18 containing fulminate of mercury or the like, and disposed adjacent the primer is a firing pin 19 which is secured to a disc 20 mounted within tube 5. Secured to the anvil block 6 are a plurality of rods 25. These rods are disposed within the shell of the bomb, but extend to different points within the shell. All rods terminate in a detonator such as indicated at 26 which is charged with fulminate of mercury. One rod, such as that indicated at 27, may serve several detonators, by extending through them as shown. This rod will have washers, such as shown at 28, secured thereto within each detonator, and so will the other rods as an impact blow must be imparted to the fulminate of mercury contained in the detonators in order to detonate the same.

A bomb of this character will usually be carried in the bomb rack of a plane, but when so carried, the propeller will be tied or otherwise secured against revolving, and rod 11 will assume the position shown in Fig. 2, that is, with its innermost end spaced away from the firing pin 19. When the bomb is ready for release, the propeller is unlocked, and when the bomb is actually released and sent on its way to a target, the blast of air will start rotating the propeller together with tube 9 and nut 10, and as it rotates, the rod 11 will move inwardly, and when the end of the threaded portion 12 is reached, the inner end of rod 11 will be in direct contact with the disc or washer 20. The propeller will, of course, continue rotating until the target is struck, but such rotation will be free as the rod has reached detonating position. When a target is struck by the cup-shaped member 14, the rod will be forced further inwardly, and will bend or free the disc 20 and strike the firing pin 19 with such force as to detonate the fulminate of mercury contained in the primer. The wave of detonation thus set up is imparted to the anvil block and is, in turn, imparted through the several rods 25, 27 to the detonators 26 placed throughout the body of the exploding charge. Thus, when the target is struck, all of the detonators indicated at 26 will detonate simultaneously and set off the explosive charge at a plurality of points throughout the body of the bomb, thus insuring simulta-

neous and instantaneous explosion of the entire charge.

The cup 14 may have perforations formed in it as indicated at 14a to permit air to pass freely through when the bomb is in flight, but when a target is struck, it immediately forms a footing which drives the detonating rod inwardly against the firing pin. For instance, the bomb might strike soft ground or water, and in that instance the rod might penetrate a considerable distance before imparting a sufficient blow to the primer to detonate, but by providing the cup here shown, the impact is immediate and instantaneous, hence detonation is sure to take place whether striking soft earth or water, and the detonation will take place before the bomb has a chance to bury itself. Thus the force of the explosion will not only be upwardly and downwardly, but also laterally in all directions and full efficiency of the explosive charge is obtained. The explosive employed may be a burning type or a detonating type. For instance, the bomb may be filled with T. N. T. or any other similar material, and detonation of such material is certainly assured by the detonating arrangement here disclosed. The mechanism for releasing the detonating rod 11 is not new, per se, but nevertheless forms a part of the firing or detonating mechanism.

The real novelty in this application is the method of detonating a large body of explosive, not only that, but of detonating it at a plurality of points throughout the body of the explosive so as to insure instantaneous explosion or detonation of the entire charge.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

A bomb comprising an elongated body portion having a nose at one end and a tail portion at the other, an explosive charge filling the body portion, a primary detonator in the nose of the bomb and fired by impact with a target, a plurality of secondary detonators disposed at different points throughout the body of the explosive charge, a housing enclosing the primary detonator, said housing having sufficient strength to remain intact during firing of the primary detonator, and a plurality of rigid non-movable rods extending from said housing to the respective secondary detonators, whereby an impact detonating wave is transmitted through the housing and the rods to the respective secondary detonators to detonate the same when the primer detonator is fired.

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