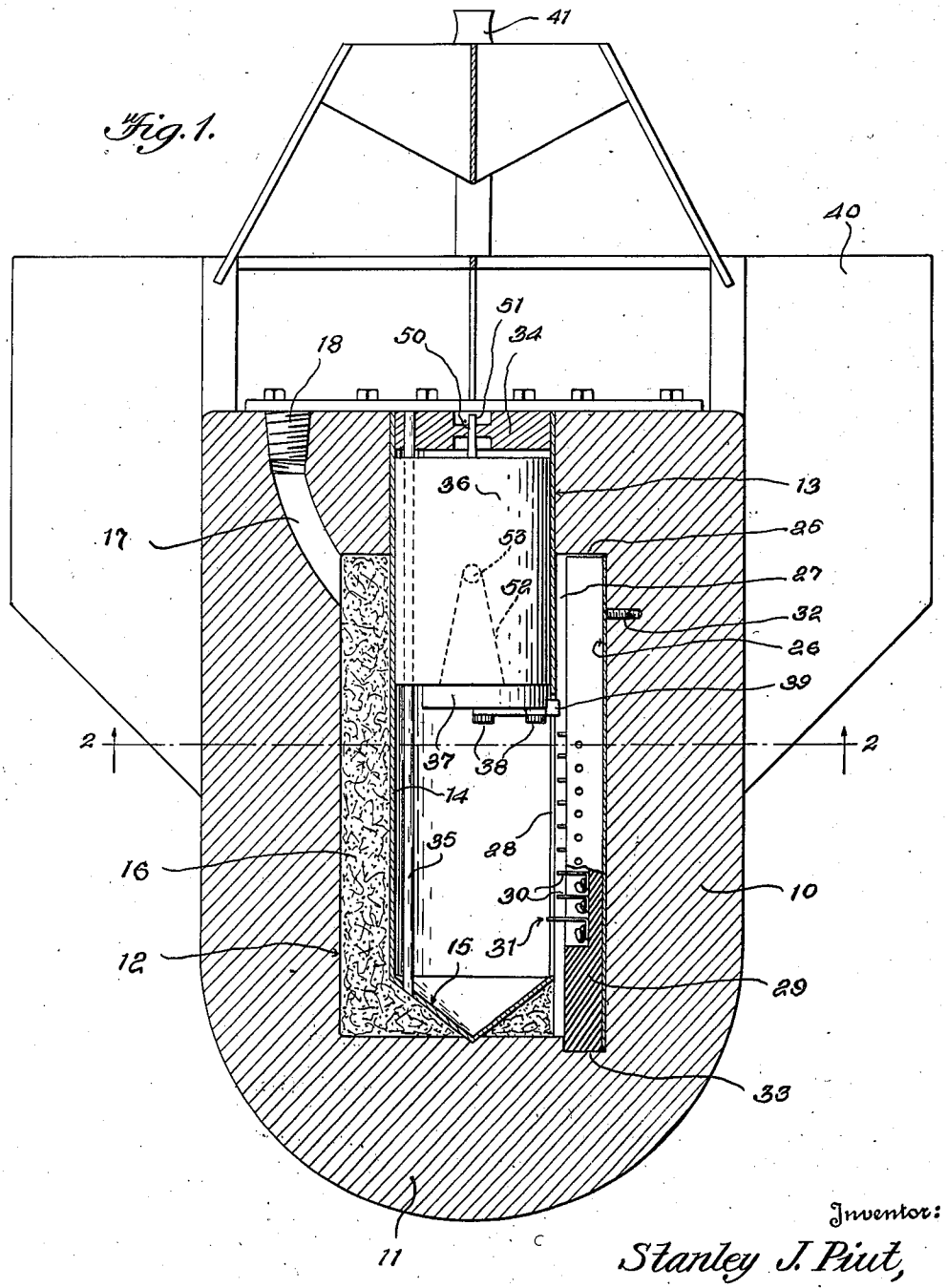
April 25, 1944. S. J. PIUT 2,347,279

AERIAL BOMB PROJECTILE

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Fig. 1.



Inventor:
Stanley J. Piut,
By Horace S. Woodward,
Attorney

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Fig. 2.

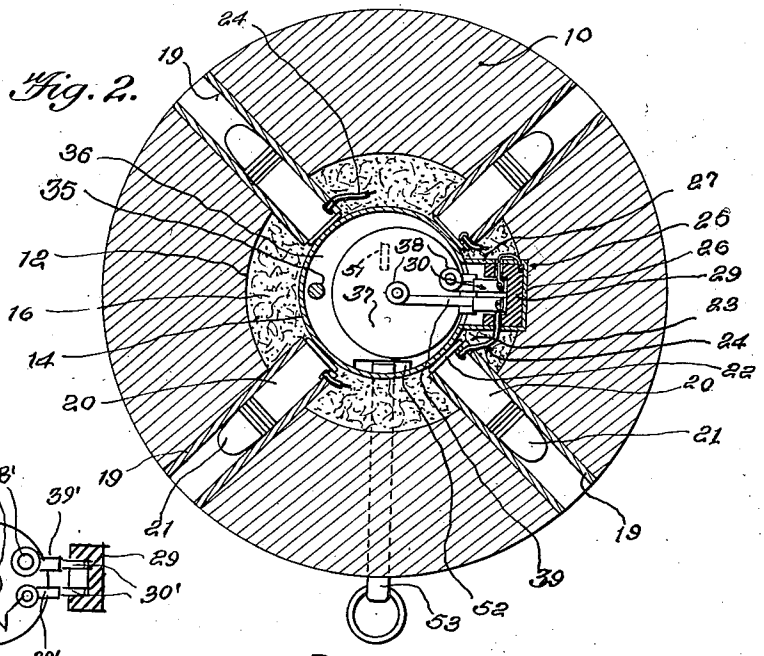
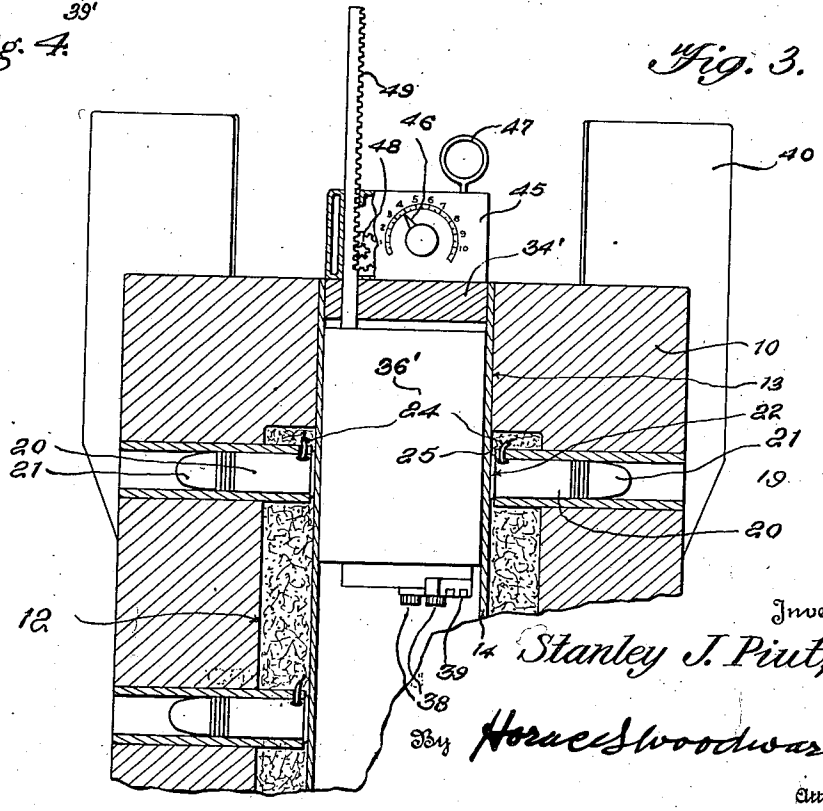


Fig. 4.

Fig. 3.



Inventor:
Stanley J. Piut,
By Horace Woodward,
Attorney

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AERIAL BOMB PROJECTILE

Stanley J. Piut, Glen Rickey, Pa.

Application May 20, 1941, Serial No. 394,378

2 Claims. (Cl. 102—5)

The invention has for an object to effect improvements in aerial projectiles of that type known as "bombs," and in which there is incorporated a number of minor projectile devices with arrangements for firing these laterally from the bomb as it descends, or upon the landing of the bomb, so that bullets may be fired from such a projectile covering a wide area beyond the point of impact of the bomb, in addition to substantial destruction effected by the explosion of a bursting charge and the scattering of fragments of the main shell of the bomb thereby.

On account of the development of present-day war methods, and the large number of such bombs which it is necessary to use, in order to be effective, it is an important aim of the present invention to enable the production of such a bomb with the functions above outlined at an extremely low cost, through the simplification of the details of the structure and apparatus, and simplification of manufacturing, assembly, and firing methods. It is an important aim of the invention to present a novel mechanism for firing radial projectiles from a main bomb body electrically, and to present a novel manner of utilizing an electric battery in such a device as well as assuring the efficiency thereof.

A further aim is to provide a novel arrangement for firing a series of bullets from such a device in succession, so that a wider area may be covered by destructive bullet fire, in addition to producing a more sustained and effective shock and morale-dampening effect upon troops and inhabitants on adjacent areas.

It is also an important aim of the invention to present the embodiment thereof in such form that it may be utilized in conventional bomb racks and other projectile carrying and dropping apparatus at present in use, such as in airplanes, particularly.

Additional objects, advantages and features of invention reside in the construction, arrangement and combination of parts involved in the embodiment of the invention, as will be understood from the following description and accompanying drawings, wherein

Figure 1 is a vertical longitudinal sectional view of a bomb constructed in accordance with my invention.

Figure 2 is a horizontal cross section thereof, on the line 2—2 of Figure 1, looking in the direction of the arrows shown.

Figure 3 is a diametrical section at an angle of forty-five degrees to the plane of the view shown in Figure 1.

Figure 4 is a detail of an induction device diagrammatically illustrated.

There is illustrated a shell body 10, which may be of conventional form suitable for use as hereinafter indicated, and being in the present instance substantially cylindrical, having a rounded nose portion 11. The body of the shell is slightly elongated, but may be more or less elongated to adapt it to the service required. It is chambered to retain a bursting charge, and may be produced in accordance with conventional practices to produce lines of cleavage, these details being well understood, and not being illustrated, for that reason.

The material of the shell may conform to approved practices, including cast iron, alloys, magnesium compounds and the like. A cylindrical chamber 12 is formed within the shell, stopping short of the nose and spaced well from the periphery of the shell, being concentric with the body of the shell. At the upper or base end of the chamber next to the top or base end of the shell, the chamber is reduced in diameter and formed with a cylindrical reduced passage or opening 13, opening through the butt or base end of the shell. Fitted snugly in this opening 13, there is a well casing 14, extending in cylindrical form to the lower or nose end of the chamber 12, and being closed at its lower end with a bottom 15 of inverted, conical form. An annular space is thus formed within the chamber 12 entirely around the casing 14, which is adapted to be filled with a bursting charge 16 of suitable explosive, as will be hereinafter explained. Leading from the chamber 12 outwardly of the casing 13 at one point, and extending to the butt or base of the shell, there is a filling opening 17, closed by a suitable screw plug 18 of the like. A multiplicity of radially arranged barrels 19 are set in the wall of the shell, extending from its periphery inwardly and across the space in the chamber 12 into close relation with the casing 13. The number and arrangement of these barrels may be varied in the discretion of the user, or manufacturer. In the present instance the barrels are spaced circumferentially as well as longitudinally on various radii of the shell. Cartridges 20 are engaged in the barrels 19 from the inner end, the cartridges having wall portions of cylindrical form snugly fitted in the barrels and having bullets 21 engaged therein in a conventional manner, the shells having thickened bases formed with lateral flanges to engage over the inner ends of the barrels 19 to effect a secure closure of the barrels, as well as afford a

stop for the shells when inserted. Each of the barrels is shown with a small notch 23 at one side opening on the inner end of the barrel, all of these notches at one side of the shell being presented in one direction circumferentially of the article, while those at the other side are presented in the opposite direction circumferentially of the shell. Each of the cartridges is equipped with a firing charge and means to fire the charge therein, which may be of conventional kind, and the details thereof not being illustrated. An electrical lead wire 24 is included as a part of the firing means, extending from the side of the shell 20 near its base.

At one side of the chamber 12 there is formed a longitudinal channel 25, in which there is set a channel-shaped case 26, open toward the casing 14, and having sides 27 butted snugly against the casing 14, which is formed with a slot 28 in its lower part, alined with the space within the case 26. A body of insulating material 29 is fixed in the case 26, and mounted on this insulation, there is a multiplicity of contacts 30, arranged in pairs transversely of the series, the pairs being spaced longitudinally of the shell as shown. A terminal set of these contacts, indicated at 31, are located at the extreme base of the series, near the lower end of the casing 14 to be utilized for igniting or detonating the bursting charge 16 in any conventional way. One of the contacts in each pair is grounded on the shell, while the other in each pair 30 only has connected thereto a respective lead 24 from one of the cartridges, all of the cartridges being thus connected to one contact 30 of a respective pair. The remaining contact of the pair 31 is connected in a conventional way to effect ignition or detonation of the charge 16 when the circuit is completed therethrough.

In order to secure the case 26 and the contacts mounted therein in place at the side of the wall, any special means for its securement during assembly may be employed, although the setting of the case 26 in the channel 25 and the subsequent introduction of the casing 14 will retain the case 26 in place. An anchorage means, however, is indicated at 32, to engage between the bottom of the case 26 and the wall of the case, and which may be of any suitable kind adapted to be utilized in this situation. The channel 25 is also shown as extended slightly below the bottom of the chamber 12, as shown at 33, and the case 26 and insulation 29 extend into this deepened part, so that they may not move laterally of the channel until the upper end is disengaged and drawn upwardly. In practice, these expedients may not be found necessary when the cases 14 and 26 engage each other as indicated.

The upper end of the casing 14 is closed by a top plate or plug 34, and this will ordinarily be secured permanently in the shell. Fixed in this plug, and also fixed in the bottom 15 of the casing 14, there is a vertical guide rod 35, and slidable in the casing 14 there is a traveller 36, consisting of a cylindrical metal shell or sleeve receiving the guide rod 35 slidably therethrough and having a battery cell 37 incorporated therein and extended slightly below the traveller, and formed with terminal elements 38 from which respective brushes 39 project through the slot 28 in position to engage the contacts 30 by longitudinal movement of the traveller downward in the casing 14. The brushes 39 are so arranged as to engage respectively one pair of the contacts 30 at a time, when the traveller is moved longitudinally as described, so as to engage the series of pairs of contacts successively throughout movement of the traveller, and thereby complete the circuit from the battery through respective passages 20 and resulting in the successive firing of these cartridges, as will be understood.

The carrier 36 has an initial position at the upper limit of sliding movement in the casing 14, at which time the brushes 39 are spaced above the uppermost contacts 30 of the series in the device.

If desired, the shell 10 may be equipped with feathering fins 40, and a whistling device 41 of conventional construction, the manner of construction and applying these being optional and adapted to follow conventional practices.

The operation of the device for firing of the cartridges 20, may be effected through inertia of the battery and traveller 36 on impact of the shell with a target, for certain types of use, or the traveller 36 may be operated by a spring-motor or clockwork 45, mounted on the base of the shell, this being illustrated in Figure 3, and carried upon the cap 34' by which the casing 14' is closed. In this case, the clockwork includes a setting device 46, and a release key 47, functioning in accordance with conventional practices in such devices and which may be of various constructions available for such use, in consequence of which the details of the mechanism are not illustrated in full. As illustrated, it includes a gear train 48, the terminal gear of which engages a rack bar 49 slidable through the cap 34' and fixed on the traveller 36', which otherwise corresponds to the traveller device before described. All other parts in the device are the same as first described. In case the clock mechanism is not utilized, and in order to retard action of the traveller 36 by momentum and impact of the shell with a target, the closure cap 34 of the casing 14 is formed with a port 50 therethrough, and the carrier 36 is formed with a wedge-shaped stopper or valve 51, which, when the carrier 36 is at the upper limit of its movement, engages snugly in the port 50, to prevent ingress of moisture or air pressure. The carrier is formed in one side with a slot 52 open against the lining 14, being somewhat wider at its lower part than at the upper part, and a manually withdrawable pin 53 is inserted through the wall of the shell, and into the casing 14, so as to enter the slot 52. The slot 52 stops short of the upper end of the carrier 36 sufficiently to engage the pin 53 as a support to hold the carrier at the upper limit of its movement in the casing 14. Thereby, accidental movement of the carrier 36 is prevented, and it may be released to operative action by manual withdrawal of the pin 53 at the proper time. The carrier preferably fits with sufficient friction in the casing 14 to prevent its movement by gravity alone.

In use, when the pin 53 is withdrawn and the projectile drops from a plane, the feathering vanes will cause it to move with the nose portion 11 in advance, so as to strike a target or other object in its path, and at that time, inertia of the carrier 36 will cause it to be projected downwardly, withdrawing the valve 51, and by the reduced area of the port 50 movement of the carrier 36 will, in a measure, be retarded, preventing firing of the cartridges in too rapid a succession.

The battery device may, if desired, include additional elements, as will be readily understood. Thus, in case it is desired to fire the cartridges 20 by means of percussion caps and electrical deto-

nating devices, and it should be desired to use a high-tension current, a loading coil 54 may be incorporated upon the battery, connected in series between one of the battery terminals and the respective brush therefor, so that by such adjustments a high potential current may be induced momentarily, these effects being well understood in the art, as well as the necessary adjustment of the brushes so that the circuit will be open earlier by the brush furthest from the coil, and so that the circuit from the coil to the cartridge will be maintained until the current discharges from the coil, so that proper detonating effects will be manifest in the cartridge.

I claim:

1. A projectile of the character described comprising the known combination of a body structure having a multiplicity of laterally extended barrel elements, projectiles therein, respective firing charges therefor, a chamber being formed in the body inwardly of the barrel elements and means provided for electrically firing the charges in each of the barrel elements including a respective electrical lead and insulated contact for each barrel unit, said contacts being arranged in longitudinal spaced relation in the projectile, a switch member slidable longitudinally in said chamber normally initially positioned at the upper limit of its movement and including an insulated brush to engage said contacts successively on longitudinal movement of the switch member and an electrical source comprising a battery mounted on the switch member and constituting an operating weight for the switch member connected electrically with the brush and with the body structure, whereby to complete a circuit successively to the respective firing means on movement of the brush.

2. In a device of the character described, a body structure comprising a multiplicity of charge firing devices therein and including a large chamber therein and a reduced circular orifice opening therefrom at one end of the body, a cylinder mounted to fit said orifice and extending to the far end of the chamber to form a space therewithout for a bursting charge in the chamber, and formed with a longitudinal slot, a channel member fixed longitudinally in the chamber without the cylinder with its open side toward said slot, a multiplicity of insulated contacts mounted in the channel member exposed toward said slot, and respective electrical leads therefrom to the firing devices, a switch device slidable in the cylinder having a brush arranged to engage said contacts successively under longitudinal movement of the switch device, an electrical source, connections therefrom to the brush and connections therefrom constructed and arranged to complete respective circuits to respective firing devices as each contact is engaged by the brush.

STANLEY J. PIUT.