V. R. MENON.

FLUID PRESSURE MORTAR AND THE LIKE.

APPLICATION FILED JAN. 5, 1920.

1,335,448. **Patented Mar. 30, 1920.**

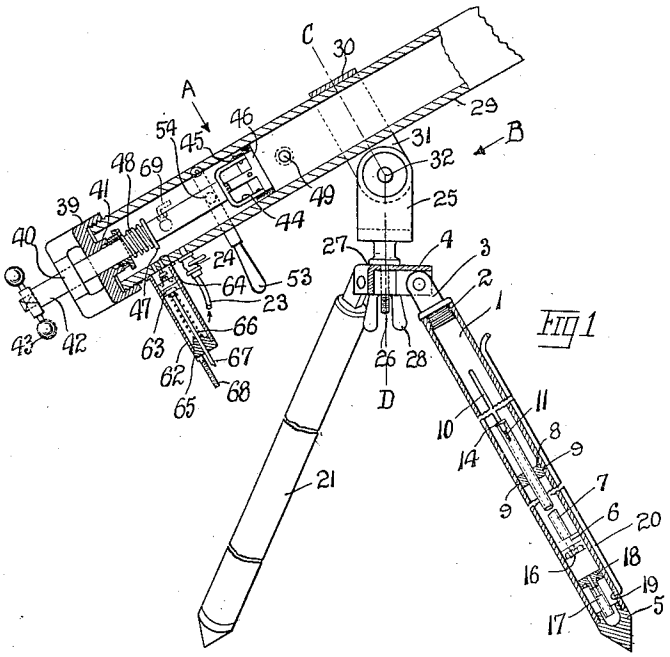


Fig 1

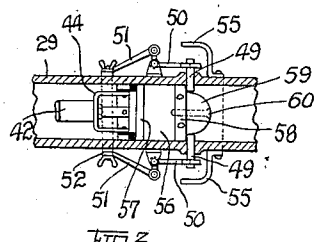


Fig 3

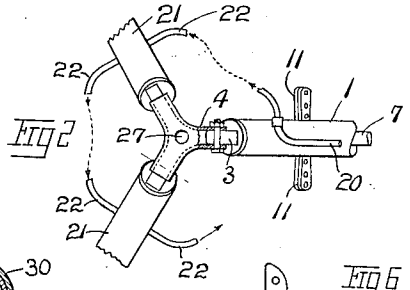


Fig 2

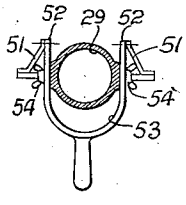


Fig 4

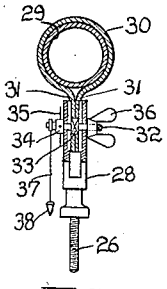


Fig 5

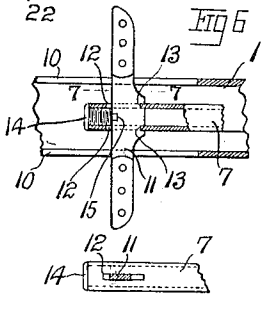


Fig 6

Fig 7

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FLUID-PRESSURE MORTAR AND THE LIKE.

1,335,448. Specification of Letters Patent. Patented Mar. 30, 1920.

Application filed January 5, 1920. Serial No. 349,651.

To all whom it may concern:

Be it known that I, VADAKKATH RAMUNNI MENON, a subject of the King of Great Britain and Ireland, residing at 36 Racecourse road, Singapore, in the Straits Settlements, have invented certain new and useful Improvements in and Relating to Fluid-Pressure Mortars and the like, of which the following is a specification.

This invention relates to an improved pressure fluid projector or pneumatic mortar, which may be used for general purposes but is especially intended for playing a game which I call "battle." By its means a dummy bomb or the like may be discharged with considerable accuracy at a target or the like.

The apparatus may be constructed in various sizes for use in schools, colleges and the like and enables a great amount of skill in the aiming and manipulation of a gun or the like to be acquired while at the same time affording considerable amusement to the marksman or player.

The invention comprises in combination a barrel for the reception of the bomb or projectile, a stand or support formed of a plurality of legs one of which constitutes a pump while at least one of the legs constitutes a receiver or reservoir into which air is pumped and from which it is supplied to the space in the barrel of the mortar behind the bomb. The bomb is retained in position within the barrel by radially extending pins adapted to be moved outwardly by bell crank or other levers, controlled by a suitable handle. Means are also provided for securing a fluid tight seal behind the bomb until the same is discharged and suitable devices are added for determining and regulating the pressure of the fluid and for aiming, elevating and controlling the mortar.

In the preferred construction the mortar is combined with a stand which may take the form of a tripod, one of the legs of which constitutes a pump while the other legs constitute receivers or reservoirs into which air is pumped and from which it is supplied to the space in the barrel of the mortar behind the bomb.

Suitable devices are added for determining and regulating the pressure of the fluid, and for aiming, elevating and controlling the mortar.

And in order that my said invention may be clearly understood I will now proceed to describe the same with reference to the accompanying drawing which shows by way of example, one method of constructing and mounting a mortar according to my said invention.

Figure 1 shows side elevation partly in section of one form of apparatus made according to my invention.

Fig. 2 shows plan of portion of same.

Fig. 3 shows cross section of a portion of the mortar with the bomb in position looking in the direction of the arrow A, Fig. 1.

Fig. 4 shows sectional elevation of the bomb release gear looking in the direction of the arrow B, Fig. 1.

Figs. 5, 6 and 7 show details hereinafter referred to.

The same numerals of reference are used to denote the same parts in all the views.

The device shown on the drawings consists mainly of two parts, *i. e.* the support or stand and the mortar or projecting apparatus.

I will first describe the stand. This consists of a tripod, one leg being formed as a pump and the two others as containers or reservoirs for compressed air. The leg forming the pump comprises a hollow tube 1 having screwed into the top thereof a plug 2 provided with a projecting lug 3, by means of which it is attached to the supporting plate 4. The plug 2 is so arranged that it is air tight. At the other end of the tube 1 another plug 5 is provided, screwed into position so as to be air tight, the outer part being pointed so as to readily engage in the ground. This plug is also air tight. If required the portion of the tube 1 in the neighborhood of the screw thread for the plugs 2 and 5 may be reinforced with outer bands or by other suitable means. 6 is a piston provided on the front with a bucket leather and being carried by a tubular piston rod 7. 8 is a guide fixed in position by means of screws or pins 9 through which the piston rod works. 10 are slots in the sides of the tube 1, which slots are located diametrically opposite one another. 11 is a plate of sheet metal which passes through the slots 10 and through other slots 12 in the upper end of the piston rods 7, see Fig. 6. 13 are notches in this plate for engaging over the hollow piston rod 7 at the lower ends of the slots 12. 14 is a screw plug screwing into the upper end of the piston

rod 7, which is provided with a projection 15 engaging with a notch in the center of the plate 11. The portions of the plate 11 projecting outside the tube 1 are furnished with suitable grips, which may, for example be composed of a thickness of wood coming on either side of the plate and suitably attached thereto. 16 is a valve in the piston 6 allowing air, when required, to pass into the front of the piston, a suitable hole being provided in the upper part of the piston rod. 17 is a non-return valve carried by a plate 18 suitably attached in position within the tube 1. This valve may be a spring valve or similar to the valve of a bicycle tire this latter being shown on the drawing. 19 is a port in the tube 1 opening into the pipe 20.

The action of this part of the apparatus will be readily understood.

Upon reciprocating the handles formed by the plate 11 up and down, the piston forces air through the valve 17 along the pipe 20.

21 are other legs of the tripod, the ends being provided with similar plugs to the plugs at the ends of the tube 1. 22 are pipes in communication with the pipe 20, so that when the pump is in action the tubes 21 are filled with compressed air. 23 is another pipe which communicates with the mortar, 24 being a valve in this pipe.

The mortar portion of the device is attached to the tripod by means of a forked member 25, preferably serrated on the interior of the fork with radial serrations. This fork has a screw threaded stem 26 passing through the central hole 27 in the plate 4, the whole being fastened in position by means of a fly nut 28. 29 is the barrel of the mortar which has attached thereto in any suitable manner a band 30, ending in two projecting portions 31 serrated on their outer surfaces, with radial serrations corresponding to those on the interior surfaces of the fork 25, see Fig. 5. 32 is a bolt provided with a squared portion 33. This squared portion fits into a corresponding squared hole in the projections 31. 34 is the bolt head which carries a pointer 35. 36 is a fly nut. It will be seen that the barrel 29 can be clamped in position at any suitable angle by means of the mechanism just described and that the pointer 35 will indicate this angle on a suitable scale marked on the exterior surface of the fork 25.

37 is a plumb line provided with a pointed bob 38, the point of which registers in a well known way with a point or marking carried by or in connection with the plate 4 to insure the apparatus being set up in the correct position. 39 is a cap screwed to the end of the barrel 29. This cap carries on the exterior a guide 40 and on the interior coming within the barrel 29 a stuffing box 41. 42 is a rod preferably hollow passing through the guide 40, the cap 39, stuffing box 41, to the interior of the barrel 29, the outer end being furnished with a handle 43 and the inner end with a number of radial fingers 44, shaped as shown. The radial arms carry a metal ring 45 having an annular groove in the upper face thereof. 46 is a rubber ring, fitting tightly within the barrel 29, the lower part being shaped to enter the groove in the ring 45 and being retained in position by suitable means. 47 is a collar on the rod 42 and 48 a spring between this collar and the stuffing box 41.

49 are pins which work in diametrically opposite holes in the barrel 29. These pins are carried, see Fig. 3, by arms 50 of bell crank levers suitably supported by brackets. The other arms of these levers are connected to links 51, in turn connected to the upper ends 52 of the arms of a forked handle 53 pivoted at 54 by means of fly nuts and bolts to the barrel 29. It will be seen when the handle is operated the pins are caused to be drawn outward. 55 are stops to limit this action.

The form of projectile or dummy bomb to be used with this form of the apparatus is shown in Fig. 3, and consists of a body 56 of suitable material provided with a binding ring 57 at the rear and with another ring 58 at the front, the ring 58 being preferably heavier than the ring 57. 59 are a series of weighting washers held in position on the bomb by means of a screw 60, a shoulder 61 being left between the washer and the bomb against which the pins 49 engage when the bomb is in the position, as shown at Fig. 3.

The action of this part of the apparatus will be readily understood. The bomb is inserted through the open end of the barrel 29 by means of a ram rod, or in some other suitable manner, the pins 49 being withdrawn from the barrel by operating the handle 53. When the bomb comes into contact with the ring 46 the rod 42 is forced back against the action of the spring 48 until the pins 49 are free to move in and engage the stop 61.

I prefer to provide in the chamber coming at the rear of the bomb a gage for indicating the pressure of the air supplied from the reservoir tubes 23. This gage may be of any form and in that shown on the drawing comprises a cylinder 62 in which a piston 63 works, 64 being holes in the barrel 29 communicating with the interior of the cylinder 62. 65 is a cap at the end of the cylinder 62 and 66 a compression spring between the piston and the cap. For stressing this spring to a greater or less extent, the cap 65 may be screwed in or out. The piston is provided with a piston rod 67. 68 is a scale marked with indications attached to the cap 65. It will be readily seen

that the pressure within the chamber behind the bomb will be indicated by the amount the piston rod 67 projects from the cylinder the readings being taken upon the scale 68.

Supposing a bomb to be in position shown at Fig. 3, and the reservoirs 21 charged with compressed air. Upon suitably operating the valve 24, compressed air passes in the barrel behind the bomb, until the required pressure is reached when the valve 24 is closed. Should an excess of pressure be present, this may be relieved by opening the release valve 69. When the proper charge of compressed air is behind the bomb, upon operating the handle 53, this bomb is discharged or projected in the required manner.

It will be understood that any suitable sighting devices may be added for aiming and for other like purposes.

It is to be observed that the particular details of construction may be varied considerably without departing from the principle of my invention, both as regards the construction of the mortar and of its stand.

For example although I have described a tripod stand it is evident that a larger number of legs may be provided, if found desirable, one or more of which may constitute pumps and one or more of which may constitute receivers or reservoirs.

In other cases a stand or supporting device of another description may be substituted, provided that it is constructed so as to constitute a pump and receiver.

Where the device is used for playing a game of battle, suitable rules may be provided for regulating the use of the weapon, aiming, scoring and other features of the game.

What I claim as my invention and desire to secure by Letters Patent of the United States of America is:—

1. A fluid pressure mortar or the like comprising in combination, a barrel for the reception of a bomb or other projectile, a support for said barrel formed of a plurality of legs, one of which constitutes a pump and at least one of which constitutes a receiver or reservoir for the reception of compressed air fed from the pump, means for holding the projectile and hand operated means for releasing the projectile after the desired volume of compressed air has been admitted into the barrel, substantially as described.

2. In a mortar as claimed in the preceding claim, a construction in which the bomb or projectile is retained in position, until released by radially extending pins, adapted to be withdrawn outwardly to release the projectile by means of bell crank or other levers, controlled from a handle or its equivalent, substantially as described.

3. In a mortar or the like, as claimed in claim 2 the spring controlled means for securing a fluid tight joint behind the projectile, substantially as described.

4. In a mortar as claimed in claim 3, the means for determining and regulating the fluid pressure, herein described.

5. In a fluid pressure mortar as claimed in claim 4 the means for securing the mortar at the correct elevation, herein described.

In witness whereof I affix my signature.

VADAKKATH RAMUNNI MENON.