A. GLISSENTI.

APPARATUS FOR THROWING PROJECTILES.

APPLICATION FILED MAY 6, 1918.

1,272,421.

Patented July 16, 1918.

2 SHEETS—SHEET 1.

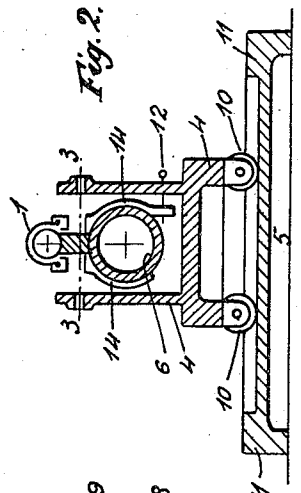


Fig. 2.

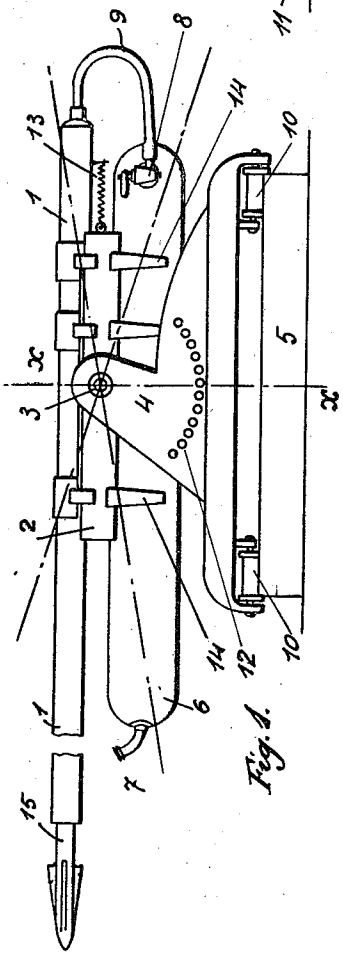


Fig. 1.

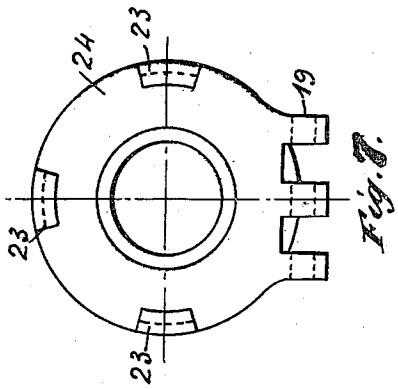


Fig. 3.

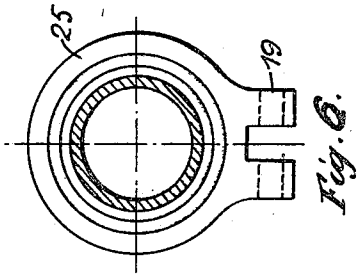


Fig. 6.

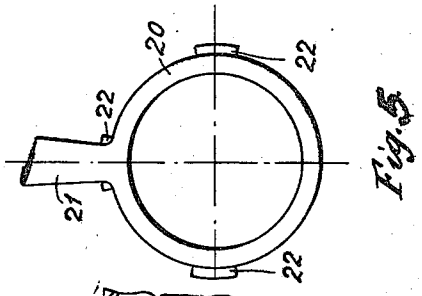


Fig. 5.

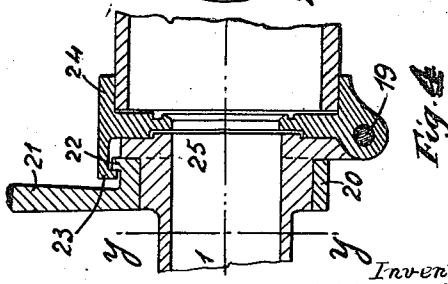


Fig. 4.

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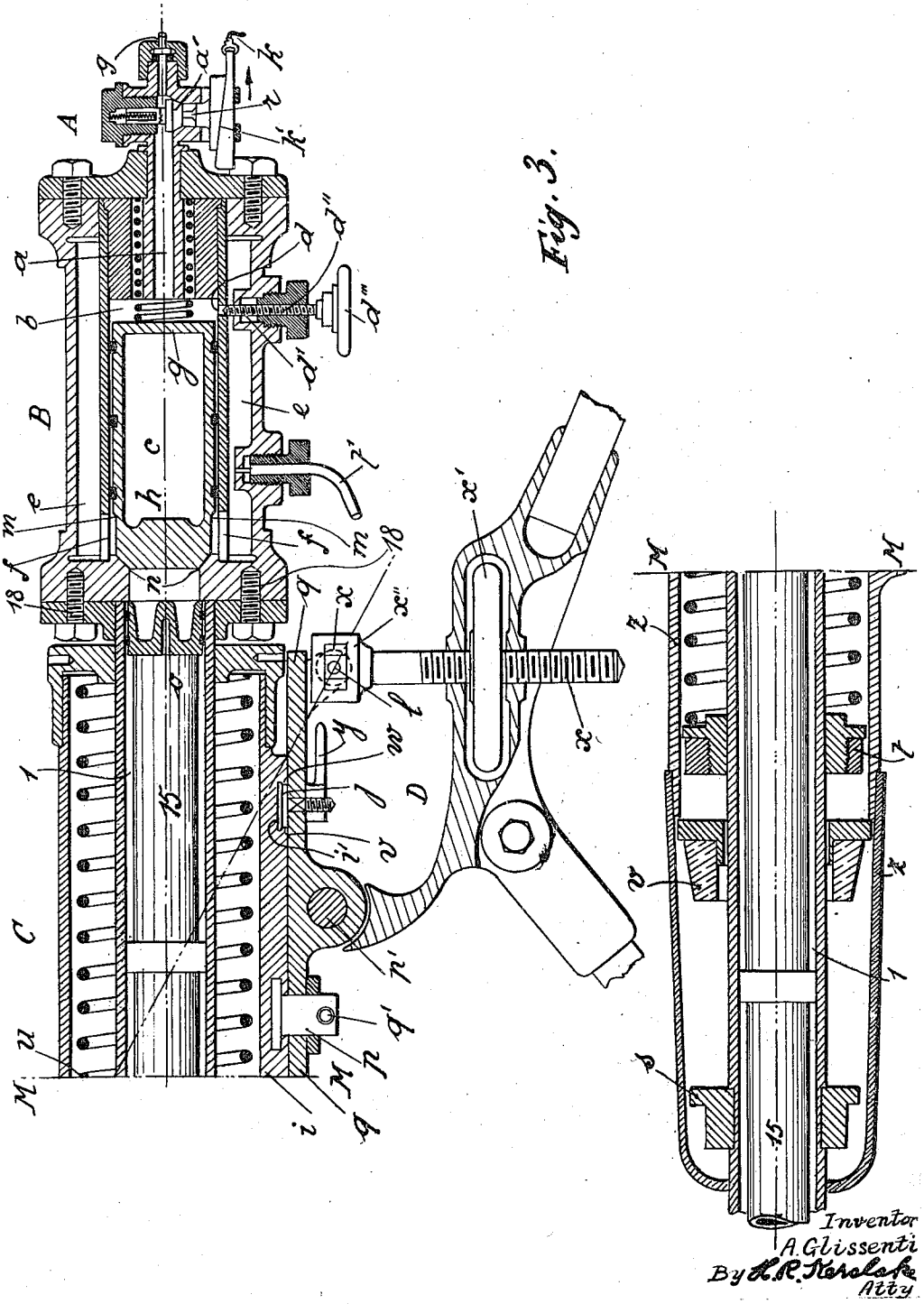


Fig. 3.

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UNITED STATES PATENT OFFICE.

ANGELO GLISSENTI, OF BRESCIA, ITALY.

APPARATUS FOR THROWING PROJECTILES.

1,272,421. Specification of Letters Patent. Patented July 16, 1918.

Application filed May 6, 1918. Serial No. 232,989.

To all whom it may concern:

Be it known that I, ANGELO GLISSENTI, a subject of the King of Italy, residing at Via Umberto I No. 20, Brescia, Italy, have invented new and useful Improvements in Apparatus for Throwing Projectiles, of which the following is a specification.

This invention has for its object to provide an improved apparatus for throwing by means of compressed air, tubes, bombs and projectiles of all kinds over preferably short distances.

The improved apparatus being more particularly designed for war purposes, is of very simple construction, so that it can be brought into action with extreme rapidity and can be trained and worked without producing detonations.

The improved apparatus is characterized essentially by a support adapted to revolve on a bed or platform, and provided with a tube for throwing the projectile, upon which an air compressor connected to the said tube acts at the proper time. Devices are provided for diminishing or taking up the recoil, and for loading the weapon at its breech end.

Two constructional forms of this invention are illustrated by way of example in the accompanying drawings in which:—

Figure 1 is a diagrammatic side elevation of the improved apparatus.

Fig. 2 is a vertical cross section on the line *x*—*x* of Fig. 1.

Fig. 3 is a longitudinal axial section drawn to a larger scale of a second constructional form of the improved apparatus.

Figs. 4, 5, 6, and 7 show details of a modification of the breech-loading arrangements.

Fig. 4 is an an axial section taken at the junction of the tube with the breech;

Fig. 5 illustrates a detail hereinafter described;

Fig. 6 is a cross section on the line *y*—*y* of Fig. 4; and

Fig. 7 illustrates a detail hereinafter described.

In all these figures the same references indicate the same parts.

Referring first to Figs. 1 and 2, 1 is the gun tube (hereinafter called the firing tube) for throwing the projectile; it is slidably mounted on the bar 2 which is adapted to turn on the axis 3 in the support or carriage 4 of the apparatus. 5 is the bedplate or platform. 6 is a compressed air reservoir fitted with a charging valve 7, and a discharging valve 8; it is connected by a small flexible pipe 9 to the rear of the firing tube 1.

The carriage 4 is provided with rollers 10 bearing on the track 11 of the gun platform so as to allow of the carriage revolving on said platform, and thereby enabling the firing tube 1 to be trained in the desired direction.

12 is a graduated arc for elevating the firing tube turning on the axis 3.

13 is an opposing spring for returning the firing tube into its normal position after each recoil.

This improved apparatus operates as follows:—

The air reservoir 6 being charged, and the firing tube 1 being loaded with the projectile, and trained in the desired direction, the cock 8 is opened and the compressed air passing through the small pipe 9 acts instantly upon the rear of the projectile which is thereby thrown from the firing tube.

The pressure of the air in the reservoir is regulated by a pressure gage (not shown) in such a manner as to produce a propelling force upon the projectile corresponding to the distance to which the projectile is to be thrown.

As shown, the air reservoir 6 is situated between the arms of the gun carriage parallel to the firing tube and is coupled to the bar 2 by means of fastenings 14. It is however to be understood that according to circumstances the air reservoir may be removably mounted on the apparatus so as to allow of a more rapid change of reservoir.

In the example shown in Fig. 3, the improved apparatus comprises essentially a device A for charging and discharging the air and a central distributing cylinder B, a gun carriage C, a gun mount D and accessory parts for regulating the pressure of the air, for effecting the training and elevation of the firing tube and for discharging the projectile.

The apparatus is charged with compressed air through the small tube 9, a passage —*a*— provided with a discharge valve —*a'*—, a central chamber —*b*— in which works a piston —*c*—, an orifice —*d*— fitted with a valve spindle —*d'*— and a concentric outer chamber —*e*— fitted with ports —*f*—.

When the apparatus is charged, the pis-

ton —c— which is under the pressure of the air in chamber —b— and of the spring —g— acting upon its rear end, forms, as shown, with its head —h— an airtight closure for the firing tube 1 which receives the explosive projectile 15 that is to be thrown.

To throw the said projectile 15 by means of the apparatus, the spindle —d'— screw-threaded at —d''— is operated by means of the hand wheel —d'''— so as to close the orifice —d—. The discharge valve —a'— is opened by pulling the cord —k—. This causes the plate —k'— to move in the direction of the arrow, and consequently to raise the stem —r— and permit the air in chamber b to exhaust into the atmosphere.

By this means the pressure exerted by the compressed air in chamber —e— upon the collar —m—, will drive the piston —c— back and the air will escape through the aperture —n— behind the rear end —o— of the projectile and thereby press upon and project the projectile 15 from the firing tube 1.

The recoil of the firing tube 1 which is mounted free on the cylinder B, is taken up by stops —s—, —t—, a coil spring —u— and an elastic cushion —v—.

The casing z, which surrounds the tube 1, is provided with a flat base i, that is pivoted for horizontal movement on a pin p, so that the firing tube may be swung horizontally for pointing in various directions. The base has a circular dovetail groove i' (a section of a portion of which is shown) and the pivot pin p forms the center of a circle corresponding to the circle of the groove i'. The pin p pivotally connects the base i to a platform q, and this platform is provided with a clamping bolt, the head j of which is slidably mounted in the circular groove i^2. The platform q is pivotally connected for vertical movement on the support D by means of a pin p'.

The training of the weapon in the horizontal plane is effected in this example by rotating the apparatus on its pivot —p—, and it is fixed at the desired point in the said plane by means of a clamping nut —y— which is adapted to clamp the head —j— against the sides —v—, —w—, of the circular recess —i'—.

For moving the weapon in a vertical plane, that is to say, elevating the weapon, the rear end of the platform —q— is connected to a long screw —x—. The raising or lowering of the breech end of the weapon, relatively to its pivot —p'—, is effected by means of the hand wheel —x'— constructed as a nut working on the screw —x—. The head —x''— of the screw —x— is formed with a slot —x'''—to allow the necessary plate to the pivot pin —l—.

The degree of pressure of the air in the cylinder B is regulated by means of a pressure gage not shown, connected to the small pipe —t'—.

To dismount the weapon from the platform it is merely necessary to remove the retaining pin —q'— and to undo the clamping nut —y—.

Figs. 4, 5, 6, and 7 show a modification designed to enable the projectile to be charged at the breech end 25 of the gun tube 1.

In this modification the gun tube instead of being fixed rigidly by means of screws 18 to the distributing breech cylinder B, as shown in Fig. 3, is connected to the cylinder B by means of a hinge 19 which enables the breech end 25 of the gun tube to be opened and exposed to receive the projectile. The breech end 25 is closed by means of a collar 20 provided with a handle 21 and teeth 22 which are caused by the rotation of the collar to engage with corresponding teeth 23 on the front portion 24 of the cylinder B.

To make an airtight joint, any suitable elastic packing may be interposed if necessary between the contacting surfaces of the two parts 24, 25.

It is to be understood that the improved apparatus hereinbefore described and shown by way of example, may be modified as regards its construction for the purpose of rendering it suitable for receiving and throwing explosive projectiles or non-explosive projectiles, and generally projectiles of any desired nature, shape and dimensions.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An apparatus for throwing projectiles comprising a firing tube, a cylinder connected to the breech of said tube and arranged in alinement therewith, means for admitting compressed fluid to the said cylinder, and a fluid controlled piston mounted in said cylinder for controlling the passage of the fluid from the cylinder to the firing tube.

2. An apparatus for throwing projectiles, comprising a firing tube, a cylinder connected to the breech of said tube and including two chambers, means for admitting compressed fluid to one of said chambers and for confining the fluid therein, a piston mounted in the other of said chambers and movable in one direction by the fluid contained in the other chamber, and means for permitting the exhaust of fluid from the second chamber to permit the fluid in the first chamber to operate the piston and admit the fluid from the first chamber to enter the firing tube.

3. An apparatus for throwing projectiles comprising a firing tube, a cylinder communicating therewith, means for permitting the exhaust of fluid from said cylinder, and means operated by compressed fluid in the

cylinder for admitting compressed fluid to the firing tube.

4. An apparatus for throwing projectiles comprising a firing tube, a cylinder connected to the breech of said firing tube and having a plurality of chambers, a piston mounted in one of said chambers and normally preventing communication between the interior of the cylinder and firing tube, means for admitting compressed fluid to said chamber for holding the piston in normal position, a valve controlled port placing the chambers in communication, other ports placing the chambers in communication near the front end of the piston, and means permitting fluid to exhaust from the piston chamber.

5. An apparatus for throwing projectiles comprising a firing tube, a cylinder communicating therewith through a passage, means for admitting compressed fluid to said cylinder, means for permitting the exhaust of fluid from said cylinder, and means normally closing the passage between the tube and cylinder and operated by compressed fluid in the cylinder for admitting compressed fluid to the firing tube.

In testimony whereof I have signed my name to this specification.

ANGELO GLISSENTI.