

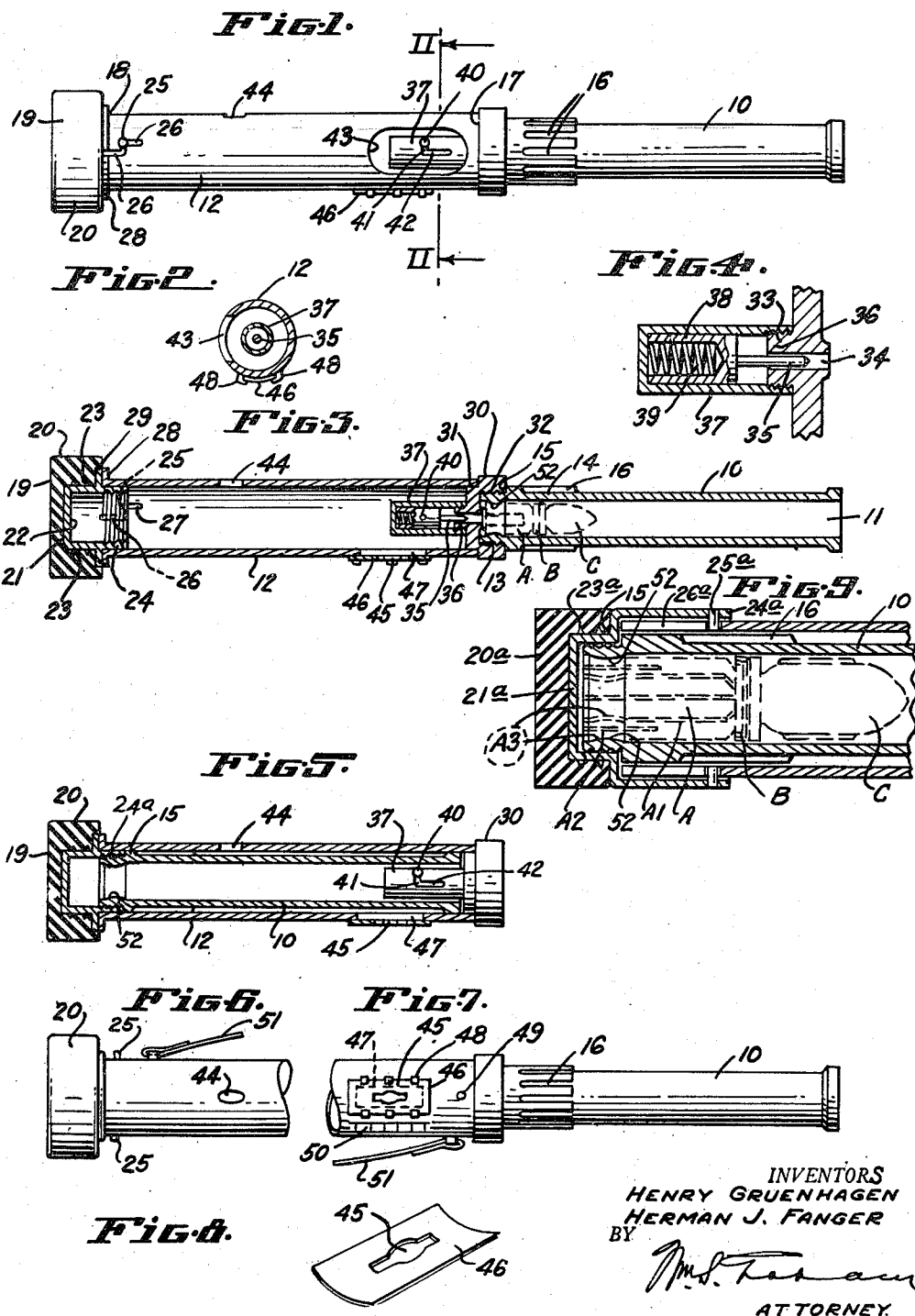
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SHOULDER MORTAR

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SHOULDER MORTAR

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This invention has relation to military mortars and more particularly relates to a type of military mortar especially adapted for employment as a shoulder weapon in which the barrel may be inserted in a casing member which also serves as a shoulder stock.

Among the objects of the invention are to provide a mortar which telescopes in the sense that the barrel may be encased for protection and portability in a casing which serves as a shoulder stock; to provide a barrel which is selectively connectable and disconnectable to a casing stock member; to provide means for releasably holding a projectile in the barrel when the muzzle end of the barrel is inclined downwardly. A further object is to provide a shoulder member which may interchangeably provide a shoulder stock and a casing for a mortar barrel, and house within the casing a firing pin mechanism which is thereby protected from injury in rough usage. Another object is to provide a mortar readily adaptable in assembly in shoulder firing, having sturdy construction with minimum of parts, which is easily and rapidly assembled and disassembled for cleaning and repair and replacement of parts, and to improve generally upon the type of apparatus described. With the foregoing and other objects in view all of which will be apparent as this description proceeds, the invention consists of the parts and combinations of parts herein illustrated and described with reference to the accompanying drawing, it being understood that various and minor changes in form, construction, materials and details may be made within the scope of the appended claims without departing from the spirit nor sacrificing any of the advantages of the invention.

One form which the invention may advantageously take is illustrated in the several views of the drawing in which—

Fig. 1 is a longitudinal side elevation of one form of the invention.

Fig. 2 is a lateral transverse section on line II—II of Fig. 1.

Fig. 3 is a longitudinal vertical section axially of Fig. 1.

Fig. 4 is a fragmentary enlargement, in section, of a portion of the structure shown in Fig. 3.

Fig. 5 is a longitudinal section showing a barrel member inserted in a casing stock.

Fig. 6 is a fragmentary top view of a portion of the structure shown in Fig. 1.

Fig. 7 is an elongated fragmentary plan bot-

tom view of a portion of structure shown in Fig. 1.

Fig. 8 is an enlarged view of a portion of structure shown in Fig. 7.

Fig. 9 is a vertical longitudinal fragmentary section of a modified form of the invention.

Referring to the drawing, in which like characters of reference indicate corresponding parts in the several views, 10 indicates an elongated cylindrical barrel open at a discharge end 11 and having at its opposite end means for coaxially connecting the barrel to a combined shoulder stock and a casing member 12, the connecting means of the barrel being herein indicated as threads 13. Adjacent its connecting end the barrel is provided with an external circumferential reinforcing sleeve 14 which is preferably integral with the barrel, but could also be made a separate member and shrunk on the barrel body. The sleeve 14 provides a shoulder 15 adjacent the thread 13 and is also provided with circumferentially spaced longitudinal grooves 16 whereby the barrel may be more firmly gripped for connecting and disconnecting the barrel relative to the stock member 12.

The combined stock and casing member 12 is a substantially cylindrical tubular elongated body which, since it does not necessarily receive explosive force, may be of substantially thinner material than the barrel and of correspondingly less tensile strength. At its forward end 17 the combined stock and casing is adapted to coaxially mount the barrel member 10, as will be more fully described hereinafter. At its opposite end 18 the tubular opening thereof is closable by a closure member 19 which comprises a cushion shoulder pad 20 which is recessed or hollowed out as at 21 to receive therein a cup or sleeve member 22 to which the pad 20 may be secured at its recess by teeth or pins 23. The cup or sleeve 22 has an extended cuff 24 adapted to slide snugly internally of the tubular stock body 12, the length of the extended cup portion 24 being substantially the same as the length of the thread 13 of the barrel 10 whereby, when the barrel is inserted in the stock casing, the cuff 24 will abut upon the shoulder 15 of the barrel and thus secure the barrel against movement in the stock casing 12 as thus shown in Fig. 5. The outer wall of cuff member 24 may carry adjacent its free edge a pair oppositely disposed radially extending pins 25 which are received in bayonet slots 26 at the shoulder-pad end of casing 12 where-

by the closure member may be releasably locked at the end of the tubular stock casing. It is preferred that the bayonet slots 26 be angularly turned intermediate its ends so that the pins 25 may slide longitudinally of the extended portion of the bayonet slot and thus relieve the pins 25 from recoil shock when the mortar is fired, it being preferred that the open end of the casing 12 be flanged outwardly as at 28 to take the recoil shock against collar-ring 29 which is imbedded in the padded member circumferentially of the sleeve 22. If it is desired, the inner axially aligned wall of the cuff may be also threaded with threads having a pitch similar to the threads on the connecting end of the barrel whereby the threaded connecting end of the barrel may be releasably connected to the cuff for facilitating the insertion and removal of the barrel from the casing or as at 24a, Fig. 5.

Interposed between the connected end of the barrel member and the mounting end 17 of the casing stock is an assembly of a breech block, firing pin, and manually operable trigger. In the present exemplification a closure block 30 of substantially heavy material is welded as at 31 in the open mounting end 17 of the stock casing. At its outer or terminal end portion the closure block is recessed as at 32, the walls of the recess being threaded to receive the co-operating threads 13 of the barrel member so that the barrel may be mounted thereto with the shoulder 15 abutting the closure block 30 when the barrel is mounted in axial alignment at the end of the casing. The closure block 30 also provides a breech end for the barrel, the breech block portion being indicated 33 and having an opening 34 therethrough for receiving a firing pin 35. At its inner or rearward end the breech block portion 33 has an axially extended threaded stub 36 which threadedly mounts thereon a cylindrical firing pin casing 37 for receiving slidably therein a firing pin cylinder 38 which is axially bored to provide a recess to receive a coiled spring member 39 which bears at the closed end of the cylinder casing 37. A manually operable trigger pin 40 is engaged in a hole 41 in the firing pin cylinder 38, the trigger member extending radially outwardly therefrom through a bayonet slot 42 in the cylindrical casing 37 and is adapted to releasably lock the trigger spring 39 against the tension thereof by engaging the trigger shank behind the shoulder of the bayonet slot 42. It will be noticed that the cylinder casing 37 is of considerably less diameter than the tubular portion 12 of the stock casing. Therefore, when the barrel is mounted at the mounting end of the stock casing the trigger pin mechanism will be mounted axially centrally thereof in space relation to the stock casing wall which protects the trigger 40 from being inadvertently released from its locked position. In order that the trigger may be readily accessible an opening 43 is provided in the wall of the stock casing whereby the trigger is accessible to the manipulating hand of an operator.

Since this mortar is especially adapted for shoulder firing, it is manifest that in operation it would be tilted at an angle with the barrel end pointing upwardly. In such upwardly tilted position a sight means is provided so that the weapon may be sighted or aimed on a line sight substantially level with the eye of the operator, by sighting through the stock casing. For this purpose there are provided at opposite

sides of the stock casing relatively offset openings 44 and 45 which are preferably somewhat elongated or ovoidal so that when the weapon is inclined upwardly the openings 44, 45 are substantially circular in a vertical plane normal to the eye. In order that accurate sighting may be accomplished at various angles of inclination of the weapon the sight opening 45, which may be referred to as the bottom sight opening, may comprise a slidable plate 46 overlying a rectangular opening 47, the plate being slidably mounted between small clip members 48 which may be stamped up at the edges of the opening. Stop members 49 may also be stamped up from the body of the stock casing to limit the movement of the plate 46, and a calibration 50 may be stamped in the casing parallel with the plate 46 so that the sight 45 may be adjusted to predetermined angles of inclination or to varying distances of range for firing a projectile.

A shoulder strap 51 of any suitable type may be connected at opposite end portions of the stock casing 12 for purposes of convenient portability of the device.

From the foregoing description it will be understood that the barrel member 10 is connectable and disconnectable from the mounting block 30 at the mounting end 17 of the stock casing. When thus disconnected the barrel may be inserted in the stock casing by removal of the shoulder pad member 19 including its attached cuff 24 whereupon the barrel may be inserted in the stock casing, muzzle end first, the cylindrical casing 37 of the firing pin sliding into the bore at the forward end of the barrel, and the cuff 24 of the shoulder member enclosing the threaded portion 13 of the barrel and engaging the shoulder 15, whereby the barrel is securely held in place upon locking of the pins 25 in the bayonet slot 26.

In the modification of Fig. 9 there is a somewhat modified form of shoulder member whereby advantage may be taken of the space in the recess of the shoulder pad member. In Fig. 9 the pin members 25(a) extend radially inwardly from the inner wall of the cuff 24(a) and engage in the bayonet slot 26(a) thus permitting the rearward or shoulder end of the stock casing 12 to abut against the transverse wall of the capping closure member 21(a), the pad 20(a) being secured thereto by the burrs or pins 23(a).

It will be noted that in Fig. 3 and also Fig. 9, there is shown by dotted lines a projectile device in the mortar barrel, which bears the reference characters A, B, C. This device consists of an adapter member A, sealing valve plate B, mounting an explosive bomb C, the detailed elements of which are not a part of this invention, but are included in other applications. The projectile device A, B, C, is conventionally shown here because this mortar is especially adapted to the firing thereof, and is illustrative of the idea that the sleeve member 23 of the mortar is preferably of sufficient axial length so as to include the adapter A and sealing plate B, since the greatest pressure of the explosive force is rearwardly of the sealing place B to overcome the inertia of the projectile body.

It is sometimes desirable that the barrel of the mortar be inclined downwardly, such as when being used by parachute troops, and also by ground troops when in action or moving about in barbed wire, underbrush and the like. There-

fore, means are provided for releasably holding the projectile in the barrel when downwardly inclined. As one example of such a means, there is provided adjacent the breech end of the barrel an annular upraised portion of slightly less diameter, of the nature of an annular ring 52 which is relatively wide axially, preferably having a gradual incline in its wall so that the free end of the portion A of the projectile device may ride up the incline. The radial thickness of the ring 52 is somewhat exaggerated in the drawings, a thickness of about two or three percent of the barrel bore being suitable, and depending also on the weight of the projectile to be used. The projectile device has elongated fins A1 having slots A2 at the free end to provide a resiliency to the edge of the fin so that the edge of the fin may pass by the annular ring 52 and resiliently bear thereagainst, whereby a resilient releasable frictional gripping engagement is obtained relatively between the annular ring 52 and the adapter fin A1, sufficient to releasably hold the projectile body A, B, C, in the barrel when the barrel is inclined downwardly, indents A3 releasably engaging the ring 52.

Having thus described the invention, what is claimed as new and patentable is:

1. A military mortar including a cylindrical barrel having a discharge end and threaded at its opposite end for releasable connection to a shoulder stock member, a shoulder stock comprising a tubular body threaded at a mounting end for coaxial releasable connection to the barrel member, being open at its opposite end to receive the barrel therein when the barrel is dismounted from the stock, said stock being of greater inner diameter than the outer diameter of the barrel for encasing the barrel, and a breech block and firing-pin assembly coaxially mounted at the connection between the barrel and the stock when the barrel is connected at said mounting end of the stock, and a manually operable trigger for operating the firing-pin.

2. In a military mortar, a cylindrical barrel having a discharge end and being threaded at its opposite end for releasable connection to a shoulder stock member, a shoulder stock comprising a tubular body having a threaded end for coaxially mounting the barrel thereto, said stock being open at its opposite end for receiving and encasing the barrel when the barrel is dismounted from the stock, a unitary assembly of a breech block, a firing-pin and a trigger coaxially mounted at the connection between the barrel and stock when the barrel is connected at the mounting end of the stock, said barrel having internally at its threaded connecting end a means releasably to engage ammunition for holding it against the inadvertent dropping out of the barrel when the barrel is inclined downwardly.

3. In a military mortar, a cylindrical barrel having a discharge end and being threaded at its opposite end for releasable connection to a shoulder stock member, a shoulder stock comprising a tubular body threaded at a mounting end for releasable coaxial connection to the barrel member, said stock being open at its opposite end for receiving and encasing the barrel when the barrel is dismounted from the stock, said stock having at its said opposite open end a removable padded closure member; a unitary assembly of a breech block, a spring actuated firing-pin and a trigger member coaxially mounted at the connection between the barrel and stock when the barrel is connected at said mounting end of the stock, said firing-pin and its actuating spring being housed in a cylindrical casing mounted at the rearward end of the breech block and extending into the tubular stock member in spaced relation to the wall thereof whereby a space is provided circumferentially of the said firing-pin housing for receiving an end of the barrel when the barrel is encased within the stock.

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