

Nov. 16, 1965

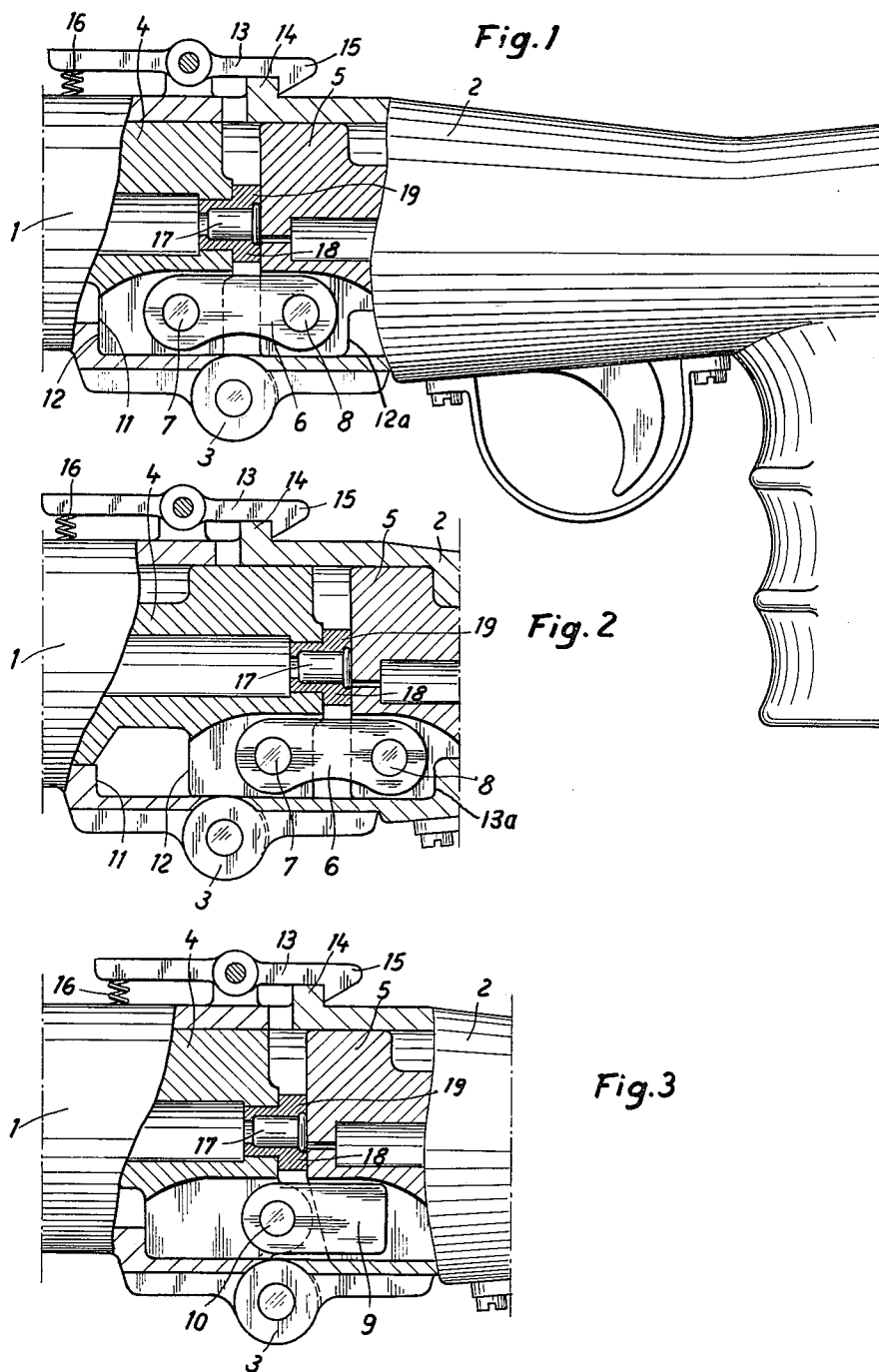
H. BEHREND ETAL

3,217,440

BOLT GUNS

Filed Dec. 17, 1963

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Fig. 4

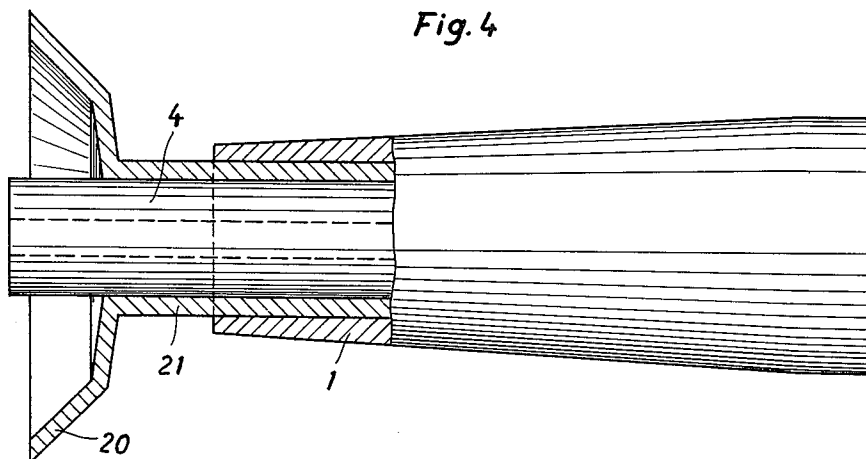
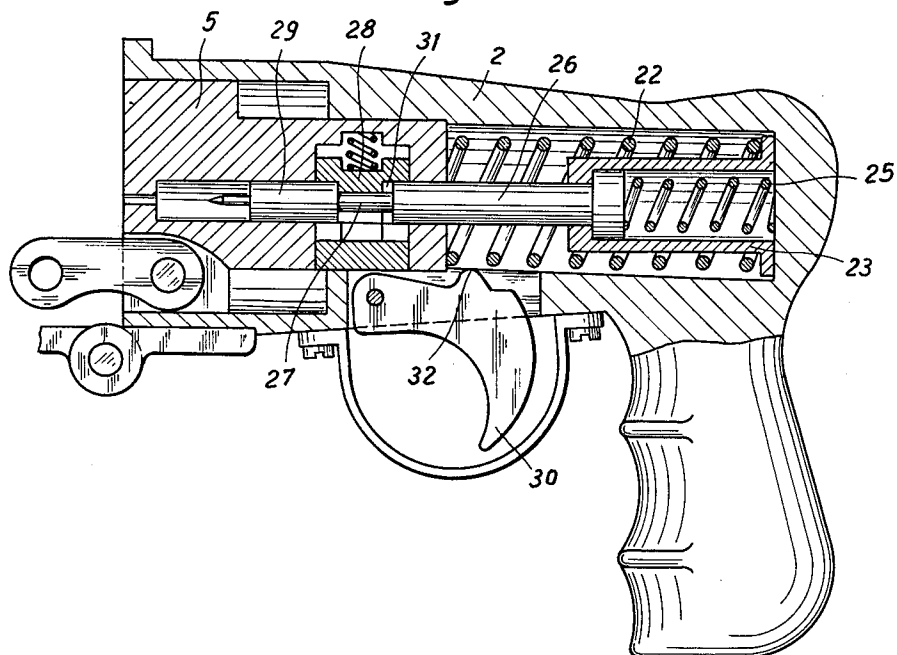


Fig. 5



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3,217,440
BOLT GUNS

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Filed Dec. 17, 1963, Ser. No. 331,306
Claims priority, application Germany, Dec. 19, 1962,
B 70,045
4 Claims. (Cl. 42-8)

This invention relates to bolt guns which are tools for driving bolts and the like into structural components such as concrete by means of an explosive charge. It is especially concerned with guns of the kind in which the part of the casing containing the barrel is pivotally connected to the part of the casing containing the breech block containing the firing pin.

The object of the invention is to provide a gun of this kind which can be fired only when the muzzle is properly placed over the position into which the bolt is to be shot and when the two parts of the casing are in the correct position in relation to one another.

To this end, according to the invention, the barrel and the breech block are pivotally connected together and are axially movable in the casing.

The pivotal connection in conjunction with the axial displaceability has the effect that when the muzzle is placed against the place into which the bolt is to be shot and the gun is pressed against this place, the barrel, which projects from the casing and the breech block are axially pushed back in the casing so that the barrel travels over the joint between the two parts of the casing and the connection between the two parts becomes rigid. The cartridge cannot be fired until this has been done.

The forward movement of the barrel and of the breech block is brought about by a spring which may act for example, on the breech block and may be limited by a shoulder in the part of the casing containing the barrel, in conjunction with a corresponding stop on the barrel. This ensures that the gap between the barrel and the breech block and the joint between the two parts of the casing coincide when the gun is not pressed against an object into which a bolt is to be fired and the breech is to be opened.

The rearward movement of the barrel and of the breech block is also preferably limited by appropriate stops.

The connection between the barrel and the breech block, or the barrel together with the breech block may be arranged to turn about the longitudinal axis with respect to the casing hinge, so that the connection can be turned, for example, so as to be situated on the side remote from the casing hinge.

Two examples of guns in accordance with the invention are illustrated in the accompanying drawings in which:

FIGURE 1 is a side elevation of the breech of the gun with parts in section and showing the breech closed before the gun is placed over and pressed against the place into which the bolt is shot;

FIGURE 2 is a view similar to FIGURE 1, but showing the gun after the muzzle has been placed over and pressed against the place into which the bolt is to be shot;

FIGURE 3 is a view similar to FIGURE 1 but showing a modification;

FIGURE 4 is a side view, partly in section, showing the forward end of the tool;

FIGURE 5 is a side view, partly in section, of the spring biasing arrangement of the breech block.

The gun comprises two casing parts 1 and 2, which are connected by a hinge 3. The casing part 1 contains a barrel 4, which projects from the casing and may have

a protective cap at the projecting part, and a breech block 5 and firing mechanism is provided in the part 2 of the casing.

The barrel 4 and the breech block 5 are also pivotally connected together on the same side as the hinge 3. The breech block has a central bore containing the firing pin. The barrel 4 and the breech block 5 are slidable in the casing in an axial direction against the action of a spring (not shown) acting on the breech block 5 and described in greater detail hereafter.

In the example shown in FIGURES 1 and 2, the pivotal connection between the barrel 4 and the breech block 5 is formed by a strap 6, one end of which is connected by a pin 7 to the barrel 4 and the other end of which is connected by a pin 8 to the breech block 5.

In the example shown in FIGURE 3, a lug 9 is provided on the breech block and one end of this lug is connected to the barrel by a pin 10.

If the barrel of the gun is placed over the place into which the bolt is to be shot and is pressed against it, the barrel and the breech block move rearwards. The barrel moves over the joint between the two parts of the casing so that the connection between the two parts becomes rigid. When the gun is lifted away the breech block and the barrel are advanced again by the spring and assume the position shown in FIGURE 1.

The forward movement of the barrel is limited by the engagement of an inner shoulder 11 of the part 1 of the casing with a stop shoulder 12 on the barrel, so that the gap between the barrel and the breech block and the joint between the two parts of the casing coincide. Similarly, the rearward movement of the barrel and of the breech block are limited by shoulders 12a and 13a.

The two halves of the casing are also provided with a catch consisting of a detent lever 13 on the part 1 of the casing and a projection 14 on the part 2 of the casing. The detent lever 13 has a nose which engages over the projection 14 in the locked position. A spring 16 tends to hold the lever 13 in the locking position. Pressure on one end of the lever releases the catch.

FIGURE 4 shows the end of the tool which is to be pressed against the work surface. The protective cap is indicated by numeral 20. The cap has a sleeve portion 21 which extends into the housing 1. The barrel 4 passes through the sleeve portion 21 of the protective cap and extends normally beyond the end of the cap. When the tool is pressed against the work surface, the barrel 4 is pushed axially into the housing. As this occurs, the breech block 5 is also pushed back as best seen in FIGURE 2. This rearward movement takes place against the biasing effect of the spring mounted in back of the breech block.

FIGURE 5 shows the breech block and its biasing spring arrangement. The coil spring 22 is compressed as the barrel and the breech block are pushed backward in the casings. Inside coil spring 22 a piston sleeve 23 is mounted and receives the piston head 24. Inside the piston sleeve 23 a coil spring 25 is mounted and urges the piston forwardly. The piston rod 26 has a reduced forward portion 27 which passes through a piston lock ring 28 to engage a firing pin 29 in the bore of the breech block 5. The lock ring 28 is spring biased toward the trigger member 30 and has an inner shoulder 31 for engagement by the end of the piston rod 26. As the breech block 5 is pushed back, the piston block ring 28 moves beyond the projection 32 on the trigger 30. When the trigger is pulled, with the breech block in the rearward position as shown in FIGURE 2, the projection 32 pushes the lock ring 28 in a transverse direction against a spring bias to move the shoulder 31 away from the end of the piston rod. The piston rod is thus re-

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leased and can plunge ahead under the pressure of spring 25 to explode the charge.

In the examples, cartridges are used to provide the explosive gases. A cartridge 17 is disposed in a cartridge holder 18 having a flange 19. The cartridge holder is held in a bore in the breech of the barrel.

We claim:

1. A tool actuated by an explosive charge, comprising in combination,
 - a first elongate casing and a second elongate casing 10 mounted relative to each other in axial alignment,
 - a barrel slidably received in said first casing,
 - first stop means in said first casing for engagement by said barrel in a forward position,
 - said barrel extending from said casing at one end in 15 said forward position of said barrel,
 - means at the other end of said barrel for receiving an explosive charge,
 - a breech block slidably received in said second casing at its inner end, said breech block having a bore 20 containing a firing pin for striking and exploding said charge,
 - means for continuously urging said breech block into contact with said barrel,
 - second stop means in said second casing for engage- 25 ment by said breech block in a firing position located rearwardly of said inner end,
 - an outer pivot connection pivotally connecting said first and second casings at a common pivot point for relative movement,
 - means for locking said casings against each other in axial alignment,
 - said barrel and said breech block being slidable to-

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gether rearwardly through said casing under pressure against said barrel at said one end, and

inner pivot means for connecting said barrel to said breech block and extending over said common pivot point in said forward position,

said barrel extending into said second casing beyond said pivot point in said firing position to provide a rigid connection between said casings at said pivot points.

2. A tool according to claim 1 wherein said inner pivot means is a rigid strap pivotally connected at one end to a first pivot pin on said barrel and at the other end to a second pivot pin on said breech block and extending between said pivot pins across said common pivot point in said forward position of said barrel.

3. A tool according to claim 1 wherein said inner pivot means is a lug pivotally connected at one end to a pivot pin on said barrel and extending with its other end in said forward position of said barrel across said common pivot point into a recess of said breech block.

4. A tool according to claim 1 wherein said breech block is spring biased to continuously urge said breech block and said barrel into said forward position.

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