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POWDER ACTUATED FASTENER DRIVING TOOL

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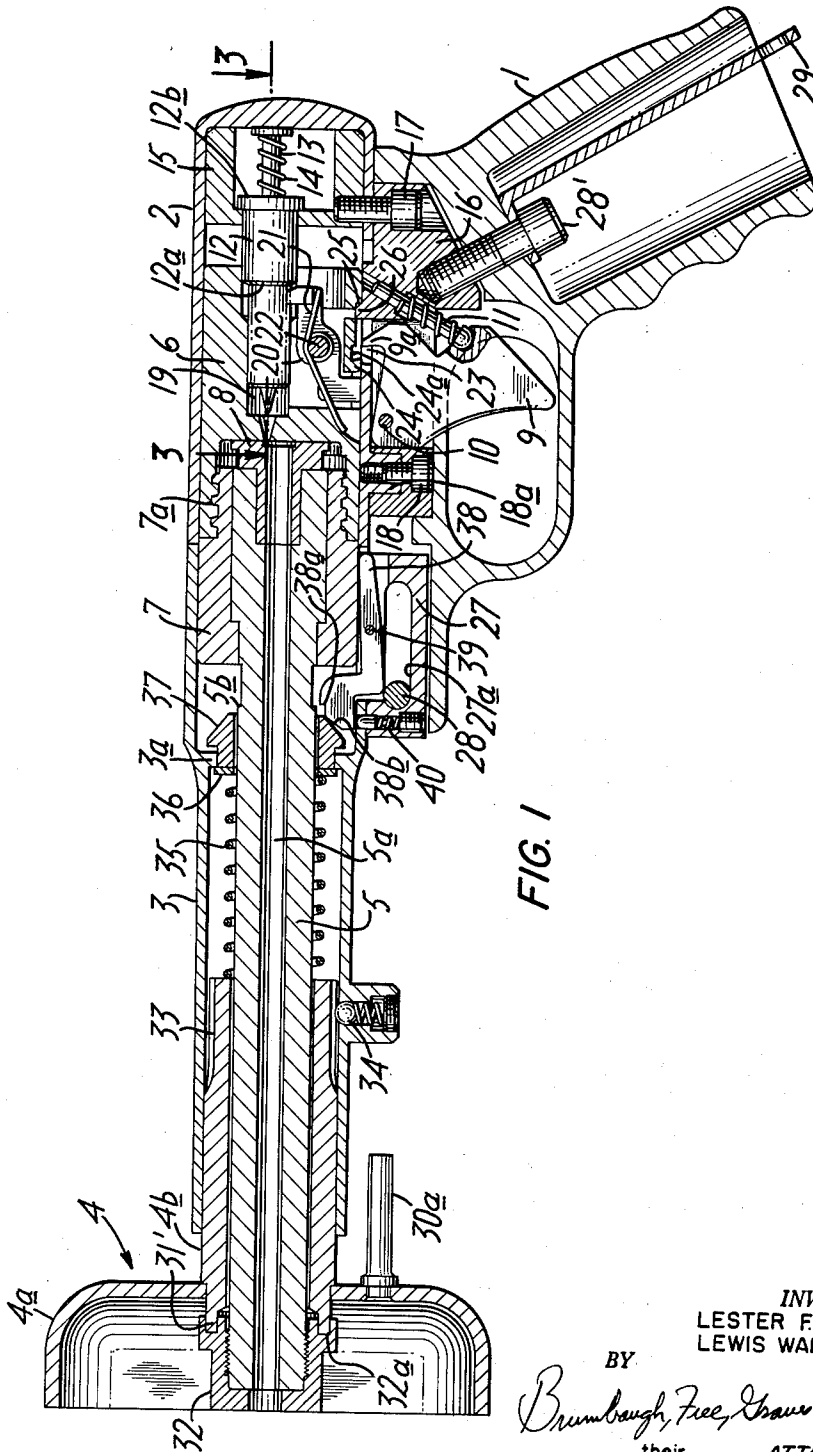


FIG. 1

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POWDER ACTUATED FASTENER DRIVING TOOL
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This invention relates to fastener driving tools, and more particularly, a new and improved tool for driving fasteners characterized by its simple construction and safe operation.

Prior devices for driving fasteners such as studs, bolts, or the like by explosion of a powder charge have been characterized by a complexity of construction which renders them difficult to manufacture and repair and further, by inadequate means to safeguard the operator and to prevent improper operation of the device.

Accordingly, it is a primary object of this invention to provide an improved powder actuated fastener driving tool consisting of a minimum number of parts arranged for particular ease of assembly and disassembly.

A further object of this invention is to provide a tool of the above character having improved safety features whereby accident hazards are reduced to a minimum.

Briefly stated, the tool of the invention comprises the combination of a breech or firing action assembly, a barrel assembly, and a handle arranged so that the handle is coupled to the firing action assembly by means of a single screw, removal of which releases the entire firing action assembly from the remainder of the tool. The firing action assembly includes a breech housing wherein a generally cylindrical breech block is spring-urged forwardly and in which a firing pin is slidably received. A sear member mounted in the breech block normally restrains the firing pin which is also spring-biased in the forward direction with respect to the housing. A portion of the breech block is formed with a recess for receiving a projection on a trigger member, the latter being mounted on a support block which is fastened to the outside of the breech housing. An inwardly projecting portion of the trigger support block is arranged to limit the forward motion of the breech block in the housing so that removal of the trigger support block permits the breech block to be withdrawn from the housing. In the uncocked position, the recess in the breech block is in register with the trigger projection, whereby actuation of the trigger is ineffective to release the firing pin and relative motion of the breech block and the housing with the trigger actuated is impossible. Cocking of the tool is accomplished by moving the breech block rearwardly with respect to the housing and the trigger, whereby the trigger projection is brought into register with a part of the sear member.

A safety shield surrounds the muzzle end of the barrel of the tool to catch fragments that may be dislodged from the work surface by operation of the tool, and this shield is rotatably mounted with respect to the barrel of the tool to enable it to assume various positions with respect to adjacent objects on the work surface. In addition, a barrel locking means is provided which prevents cocking of the tool when the shield is removed.

The foregoing and other objects and advantages of the present invention will become more apparent from the following detailed description thereof, when taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a view in longitudinal section through the tool with the breech assembly in the uncocked position;

FIG. 2 is a partial sectional view of the tool with the breech assembly in the cocked position; and

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FIG. 3 is a fragmentary sectional view of the breech assembly of the tool taken along the lines 3—3 of FIG. 1.

Referring now to the drawings a typical tool arranged according to the present invention comprises a handle 1, conveniently of the pistol grip configuration, a breech housing 2, and a barrel housing 3. As shown, the breech housing and barrel housing are of cylindrical shape, although any suitable configuration may be used. A safety shield 4 is provided at the muzzle end of the tool.

Within the barrel housing 3 there is a barrel 5 having a bore 5a therein for discharging a stud or other fastener while the breech housing 2 encloses a breech block 6, which is of generally cylindrical configuration. A collar member 7 is rigidly fastened about the breech or rearward end of the barrel 5 and this collar is arranged in the manner described below to be releasably locked to the breech block 6. In the breech end of barrel 5 there is a breech plug 8 for receiving a powder charge which may be a blank cartridge (not shown). The breech plug 8 may be slidably withdrawn from the breech end of the barrel 5 when the tool is in its opened or broken position with the barrel and breech block disconnected.

The interlock arrangement between the breech block 6 and the collar member 7 may be of any suitable type, but preferably, it is of the interrupted-thread type known in the prior art. In this arrangement, segments of mating threads, indicated at 7a in FIG. 1, are formed in the breech block 6 and the collar member 7 so that rotation of one with respect to the other is required to bring the thread segments into interlocking relationship. In the present embodiment, the barrel and its collar are rotated while the breech block is held fixed, to provide the interlock.

Also mounted within the breech housing 2 is a generally cylindrical firing pin guide block 15 while, outside the breech housing, a trigger support block 16 is fastened to the housing 2 by means of two screws 17 and 18. The screw 17 threadedly engages the firing pin guide block 15 whereby both the guide block and the trigger support block are held fixed with respect to the breech housing, the screw 18 being received in a threaded hole in a projection 18a on the breech housing 2. The projection 18a fits closely in a corresponding hole in the trigger block 16 and serves to locate the trigger block and, consequently, the firing pin guide block 15, accurately with respect to the breech housing 2.

A trigger 9 is supported in a longitudinal slot in the support block 16 by a pivot pin 10 extending transversely through the block and it is formed with an inwardly extending projection 9a, adapted to extend into the breech assembly as will be hereinafter described. A plunger and spring assembly 11 normally urges the trigger 9 toward a forward position with the projection 9a withdrawn from the housing and returns the trigger to this position after it is released.

Slidably received in aligned bores in the breech block 6 and firing pin guide block 15 is a firing pin 12. A compression spring 14 supported on a guide pin 13 extending into an axial bore in the firing pin urges the pin forwardly towards the barrel assembly but the forward motion of the firing pin is limited by a flange 12b at the rear of the firing pin which abuts the guide block 15 in the forward pin position. Within the breech block 6 a sear lever 20 is pivotally supported by a pivot pin 22 and is normally urged in a counter-clockwise direction as viewed in the drawings by a torsion spring 21. In this condition, the inner end of the sear lever is aligned with a shoulder 12a on the firing pin so that rearward motion of the breech block 6 and the sear lever 20 will

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move the firing pin rearwardly to a cocked position, compressing the firing pin spring 14.

An opening 23 in the breech housing 2 adjacent to the trigger support block 16 permits the trigger projection 9a to communicate with the breech block 6. When the breech block is in its normal, forward position with respect to the breech housing, a portion 24 of the breech block, formed with a recess 24a, is located next to the opening 23 so that operation of the trigger with the tool in this condition causes the projection 9a to enter the recess 24a, inhibiting rearward motion of the breech block in the breech housing. As a result, the tool cannot be cocked while the trigger is held in the actuated position. If desired, the portion 24 may comprise a removable cover plate for the cavity in which the sear lever 20 is mounted. To the rear of the recess 24a, the breech block has a forwardly-facing shoulder 25 which abuts a projection 26 extending inwardly from the trigger support block 16. This arrangement retains the breech block 6 in the breech housing 2 while the trigger support block is in place, but permits easy removal of the breech block when the support block is removed.

Affixed to the barrel housing 3 is a slotted block 27 having a longitudinal slot 27a formed therein. A transverse pin 28 is rigidly mounted in the forward end of the handle 1 and is arranged to slide freely within the slot 27a, the handle portion 1 being rigidly affixed to the trigger support block 16 by means of a single screw 28', which is recessed in the grip portion of the handle. In addition, this screw also retains a hanger member 29 having a hole near one end to permit the tool to be hung on a hook or the like. From the foregoing, it will be seen that with the breech block interlocking arrangement in the unlocked position, the handle portion and the breech housing may be moved rearwardly of the barrel housing a distance equal to the length of slot 27a, which is made sufficient to enable complete separation of the breech block from the barrel. The handle may then be rotated downwardly with respect to the barrel portion, or "broken," to facilitate insertion of projectiles and powder charges and removal of spent cartridges.

It will also be noted that the handle portion 1 is connected to the trigger support block 16 by means of a single screw 28', removal of which completely frees the handle from trigger support block 16. The firing action assembly may then be completely disassembled merely by removal of the two screws 17 and 18 which anchor the support block to the assembly, since the projection 26 engaging the recess 25 on the breech block 6 is the only means for retaining the breech block within the breech housing 2.

As shown in FIG. 3, which is a horizontal section through the breech assembly, a pair of springs 30, mounted on spring guides 31 and extending from the firing pin guide block 15 into recesses in the breech block 6, urge the breech block forwardly within the breech housing 2, the forward motion being limited as described above by the projection 26 and the shoulder 25.

It will be readily apparent that the breech assembly can be completely disassembled by first removing the screw 28', which disconnects the breech housing and the trigger support block from the handle 1, and then removing the two screws 17 and 18 and disengaging the trigger support block from the housing.

Inasmuch as the projection 26 on the support block no longer engages the shoulder 25, the breech block 6 is then free to slide out of its housing 2. This permits the springs 30 and spring guides 31 to be withdrawn from the housing. Also since the screw 17 has been removed, the guide block 15 is likewise free to slide out, as are the firing pin 12, the spring 14 and spring guide 13 for the firing pin. Upon reassembly, with all of the components in their prescribed places, it is necessary only to move the projection 26 into abutting relation with the forwardly-facing shoulder 25 on the breech block to insure that the

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hole in the housing 2 for the screw 17 is properly aligned with the threaded hole in the guide block 15. Accordingly, the breech assembly may be completely disassembled and reassembled with a minimum of manual dexterity and effort. It will also be noted that a minimum number of parts is used in the breech assembly which thus contributes to ease of manufacture and freedom from breakdown problems.

The shield, indicated generally at 4, comprises a chamber defining portion 4a and a sleeve portion 4b rigidly fastened thereto by welding or the like. The chamber defining portion 4a preferably is a metal shell of rectangular cross-section in the plane perpendicular to the barrel axis, but if desired, the shield can have other suitable shapes. In the assembled condition, the sleeve 4b slidably engages the outer surface of the barrel 5 and is rotatable thereon to permit the shield to be turned to any angular orientation with respect to the tool handle 1. A cartridge ejector pin 30a may be fastened, such as by riveting, to the chamber defining portion 4a of the shield to facilitate removal of spent cartridges from the breech plug 8.

The shield sleeve 4b extends inwardly into the volume encompassed by the chamber-defining portion 4a and terminates therein in an annular rim 31' radially displaced from the barrel 5. A cap nut 32 threadedly engages the muzzle end of barrel 5 and includes an annular recess 32a for receiving the rim 31' of the sleeve 4b. In this way a labyrinth is formed between the shield chamber and the space between the barrel 5 and the shield sleeve 4b, inhibiting the passage of dust and fragments from the shield into the tool. The nut 32 is provided with a central bore in register with the bore 5a of the barrel. With the cap nut 32 in place, it can be seen that the shield 4 is free to rotate about the barrel 5 or to move towards the breech end of the tool. The shield cannot, however, be removed from the tool without first removing the nut 32.

On the outer surface of the sleeve 4b there are a plurality of angularly disposed longitudinal grooves 33 which cooperate with a spring biased ball detent 34 mounted in the projection on the barrel housing 3. The shield structure 4 may then be rotated about the barrel axis and releasably retained by the groove and detent arrangement 33, 34, in any one of a number of desired positions. The particular position of the shield structure desired may be dictated by the shape of the chamber defining portion 4a and the contour of the work against which the tool is used. There is thus provided a more versatile shield assembly which reduces the operator hazard by adapting itself to varying contours of the work surface and adjacent objects.

The shield 4 is normally maintained in its forward position as illustrated in FIG. 1 by a spring 35 surrounding the barrel 5 and retained under compression between the end of the sleeve 4b and a washer 36 which bears against an internal shoulder 3a formed in the barrel housing 3. As will be obvious from this construction, the shield assembly is urged toward the muzzle end of the tool so that the annular rim 31' normally bottoms in the recess 32a, and it can be moved rearwardly against the action of spring 35 independently of other elements of the tool until the chamber defining portion 4a meets the front end of the barrel housing 3.

The shield assembly 4 is intended to safeguard the operator and others in the vicinity of the tool, and in order to prevent operation with the shield removed, a lock arrangement is provided. This lock arrangement comprises a Z-shaped detent lever 38 mounted on a pin 39 fixed in the slotted block 27 which is mounted in the barrel housing 3. On one arm this lever includes a detent portion 38a and a chamfered portion 38b, the detent portion being adapted to engage an annular shoulder 5b formed on the exterior surface of the barrel 5. The chamfered portion 38b is normally in contact with the conical surface of an annular ring 37 mounted in the barrel housing 3. A

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spring-biased plunger 40 urges the detent portion of the lever toward the barrel adjacent to the shoulder 5b.

With the shield in place as required, the washer 36, under the compressive force furnished by the spring 35, forces the ring 37 to the right, as viewed in FIG. 1 so that the conical surface engages the chamfered portion 38b of the lever 38, forcing the detent away from the barrel 5 against the force of the spring and plunger 40. As long as the shield is in place, engagement of the detent 38a and the shoulder 5b is prevented and the barrel 5 is free to move rearwardly in the housing to permit cocking of the tool. Upon removal of the shield, however, the compressing force of spring 35 no longer is applied against the annular ring 37 and the spring biased plunger 40 enables the lever 38 to push the ring out of the way and engage the shoulder 5b. In this condition, the barrel 5 cannot be moved into cocking position, and therefore the tool cannot be fired by the operator. Upon reinsertion of the shield, the compressive force of spring 35 is re-applied and the lever 38 is forced out of engagement with the barrel so that the tool can be cocked for firing.

As illustrated in FIG. 1, when the tool is in its uncocked or normal condition, the breech block 6 and the barrel 5 are urged by the combined action of springs 30 and 35 to a forward position with respect to the housing members 2 and 3 so that the forwardly-facing shoulder 25 of the breech block abuts the projection 26 on the trigger support block 16. In this position, the projection 9a on the trigger 9 is aligned with the recess 24a and the trigger is unable to engage the sear lever 20. It will also be noted that the shield 4 is in its most forward position with respect to the barrel housing 3 when the tool is in the uncocked condition, the rim 31' being seated in the annular recess 32a of the cap nut 32.

As illustrated in FIG. 2 which shows the tool in the cocked condition, cocking is accomplished by pressing the muzzle end of the tool against a work surface 45 and displacing the barrel housing 3 and the breech housing 2 forwardly with respect to the barrel and breech block against the force of springs 30 and 35 until the firing pin guide block 15 abuts the rear face of the breech block 6. During this motion the sear lever 20 engages the shoulder 12a and prevents the firing pin from moving forwardly with the guide block 15, thereby compressing the firing pin spring 14. At the same time the trigger projection 9a is moved into alignment with the outer end of the sear lever 20 so that actuation of the trigger 9 can pivot the lever 20 so as to release the firing pin. When this is done the spring 14 drives the firing pin forwardly into a corresponding opening provided in the breech block and into contact with a cartridge located in the breech plug to detonate the cartridge and drive a projectile into the work surface.

It will be noted in FIG. 2 that a slight gap exists between the barrel housing 3 and the chamber defining portion 4a of the shield in the cocked position. This enables cocking to be accomplished with the tool slightly displaced from perpendicular to the work surface, and thus irregular surfaces may be more readily accommodated. If the tool is tilted more than a selected amount, however, for example five degrees, engagement of the forward end of the housing 3 with the shield 4 permits the barrel and the breech block to move forwardly within the housing a sufficient distance so that the trigger projection 9a no longer is aligned with the sear lever 20 and the tool cannot be fired. Removal of the muzzle end of the tool from the work surface permits the springs 30 and 35 to restore the breech block, barrel and shield to their forward positions with respect to the housings 2 and 3. As this is done the firing pin 12 is withdrawn from the breech block 6 by the guide block 15 and the sear lever 20 returns to its normal position under the influence of the spring 21.

As discussed hereinabove, the breech locking arrangement preferably used with the present invention is of the

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interrupted thread type, requiring relative rotation between the barrel collar 7 and breech block 6 to lock the two parts together. To enable this locking action to be performed simply, as well as to provide a further safety feature which prevents firing of the tool with the breech in the unlocked condition, a pin and slot arrangement is provided. This arrangement comprises an angular slot 41 formed in the barrel housing 3 adjacent to the breech housing 2 and a longitudinal slot 42 in the breech housing extending from one end of the slot 41, the slots 41 and 42 forming an L-shaped cutout in the tool housing when the tool is in its closed condition. Rigidly affixed to barrel collar 7 and extending radially therefrom is a pin 43, adapted to be received within the slots 41 and 42. A friction plate 44 affixed to the outer end of the pin 43 facilitates actuation thereof by the operator.

In the uncocked condition of the tool, the pin 43 is located in the slot 41 and angular motion of the pin therein serves to lock or unlock the barrel and breech block. In the unlocked position, the pin 43 is located in the upper portion of the slot 41 as viewed in FIG. 2, and thus it prevents the barrel and the breech block from being moved rearwardly with respect to the housing so that the tool cannot be cocked. With the pin 43 at the other end of the slot 41, the interrupted thread arrangement is in the locked condition and, since the slot 42 extends longitudinally from that end of the slot 41, the housing can now be displaced forwardly with respect to the barrel and breech block to allow the tool to be cocked. When the pin 43 is in its uppermost position in the slot 41 as viewed in FIG. 2, the breech locking mechanism is unlocked and the handle portion of the tool may be withdrawn from the barrel portion and pivoted about the pin 28 to expose the breech plug 8. This slot and pin arrangement therefore provides a simple device exterior of the tool for opening the tool for loading, as well as providing a safety lock for preventing firing of the tool with the breech in the unlocked condition. Moreover, the pin 43 provides a forward stop for the barrel 5 in its housing 3 by its engagement with the edge of the slot 41.

It is apparent from the preceding disclosure that the barrel and shield can easily be withdrawn from the housing by merely removing the cap nut 32 from the barrel muzzle. When the cap nut 32 is removed from the muzzle of the barrel 5, the shield 4 can of course immediately be withdrawn forwardly from the barrel housing 3. However, inasmuch as the barrel 5 is attached to the collar member 7, whose cross-sectional dimensions are greater than the minimum interior cross-sectional dimensions of the barrel housing 3 forwardly of the collar 7, the barrel 5 can be withdrawn from the housing 3 only rearwardly. Moreover, the barrel 5 cannot be withdrawn from the barrel housing 3 unless the tool is first "broken" and the detent portion 38a of the Z-shaped detent lever 38 made to afford passage for the annular shoulder 5b on the barrel 5. There are two ways of making the portion 38a afford such passage after the cap nut 32 is removed. First, a small sharp tool such as a nail may be engaged with the end of the lever 38 opposite the portion 38a and employed to force the lever 38 counterclockwise as seen in FIG. 1. (The end of the lever 38 opposite the portion 38a is of course accessible from the rear when the tool is "broken.") Alternatively, the annular ring 37 may be held against the chamfered portion 38b of the lever 38 even after the cap nut 32 is removed. A convenient way to retain the annular ring 37 in the desired position after the cap nut 32 is removed is to hold the shield 4 in position manually after the cap nut 32 is removed so that the spring 35 continues to bear against the washer 36.

In operation, an appropriate fastener of a conventional type is inserted in the breech end of the bore 5a, the tool being opened in the manner previously described. A suitable blank cartridge is then inserted in the breech plug and the tool is closed by pivoting the breech portion into

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alignment with the barrel portion and moving it forwardly to engage the locking mechanism. Operation of the pin 43 to the lower position in the slot 41, as viewed in the drawings, locks the two parts of the tool together. As previously mentioned, the tool is fired by pressing the muzzle end of the barrel against the workpiece, moving the housing forwardly with respect to the barrel and breech block, and actuating the trigger. After release of the firing pin, as discussed above, and detonation of the cartridge, the tool is then broken again, and the breech plug is removed and slipped over the pin 30a to remove the spent cartridge. The tool is then ready for reloading and application of another stud to the work surface.

As is apparent from the foregoing, the structure of the present invention provides a fastener driving tool which is extremely simple in construction, providing ease of maintenance and repair. The improved safety features render improper firing of the tool virtually impossible; the tool being incapable of being fired in the uncocked position, with the breech unlocked, with the shield removed, or when tilted appreciably with respect to the work surface.

While a representative embodiment of the present invention has been shown and described for purposes of illustration, various changes and modifications may be made therein by those skilled in the art without departing from the principles of this invention. Therefore, all such changes and modifications are included within the intended scope of the invention as defined by the following claims.

We claim:

1. A powder actuated fastener driving tool comprising housing means, barrel means slidably mounted in the housing means having a breech end adapted to receive a fastener and a powder charge and a muzzle end adapted to be placed against a work surface in which the fastener is to be driven, breech block means slidably mounted in the housing means and engageable with the breech end of the barrel means, spring means urging the breech block means forwardly within the housing means, and abutment means mounted externally of the housing means and having a projection extending into the interior of the housing means operatively associated with the breech block means to limit the forward motion thereof, the abutment means being removable from the housing means to permit the breech block means to be withdrawn from the housing means.

2. A powder actuated fastener driving tool according to claim 1 wherein the abutment means comprises a trigger support block and including trigger means pivotally mounted on the support block having a projecting part movable into operative association with the breech block means.

3. A powder actuated fastener driving tool according to claim 2 including further abutment means mounted within the housing means limiting rearward motion of the breech block means therein, and sear means movable with the breech block means between a rearward position in which it is aligned with the projecting part of the trigger means to permit operation of the sear means by the trigger means and a forward position in which the sear means is out of line with the projecting part of the trigger means.

4. A powder actuated fastener driving tool comprising housing means, barrel means mounted in the housing means having a breech end adapted to receive a fastener and a powder charge and a muzzle end adapted to be placed against a workpiece in which the fastener is to be driven, breech block means mounted within the housing means engageable with the breech end of the barrel means, firing pin means slidably receivable in the breech block means, spring means urging the firing pin means forwardly in the breech block means toward the breech end of the barrel means, cocking means movable within the housing means between a normal forward posi-

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tion and a rearward position and adapted to drive the firing pin means rearwardly to a cocked position in response to rearward motion, trigger means mounted externally of the housing means having a projecting part movable into the housing means upon actuation of the trigger means, and an element movable with the cocking means and formed with a recess positioned to receive the projecting part of the trigger means when the trigger means is actuated with the cocking means in its forward position, thereby preventing rearward motion of the cocking means.

5. A powder actuated fastener driving tool comprising housing means, barrel means mounted in the housing means having a breech end and a muzzle end and normally movable between a forward position and a rearward position with respect to the housing means, rearward motion of the barrel means in the housing means being effective to cock the tool, deflector shield means surrounding the barrel means near the muzzle end for engagement with a surface into which a fastener is to be driven, sleeve means surrounding the barrel means and supporting the shield means for relative longitudinal motion with respect to the barrel means, abutment means within the housing means, washer means surrounding the barrel means and normally abutting the abutment means, spring means extending between the washer means and the shield means urging the shield means forwardly with respect to the housing means and the washer means rearwardly against the abutment means, collar means surrounding the barrel means engaging a rear surface of the washer means and having a rearwardly facing cam surface, the outer surface of the barrel means being formed with a recess, and detent means mounted in the housing means and radially movable with respect to the barrel means having a first portion adapted to project into the recess in the barrel means to prevent rearward motion thereof with respect to the housing means and a second portion engaging the cam surface of the collar means so that the first portion is normally held away from the recess in the barrel means, whereby removal of the force applied by the spring means permits the collar means and the washer means to move forwardly on the barrel means so that the second detent portion is released from the cam surface and the first detent portion is permitted to move into the recess in the barrel means.

6. A powder actuated fastener driving tool according to claim 5 wherein the detent means comprises a lever member pivotally mounted in the housing means having one end formed with said first and second portions and spring-biased toward the barrel means.

7. A powder actuated fastener driving tool comprising housing means, barrel means mounted in the housing means having a muzzle end projecting therefrom, deflector shield means surrounding the muzzle end and adapted to engage a surface into which a fastener is to be driven, an annular lip projecting forwardly from the shield means and surrounding the barrel means, and cap means mounted on the muzzle end of the barrel means having an annular groove normally receiving the annular lip of the shield means, thereby forming a labyrinth between the shield and the outer surface of the tool barrel to inhibit the passage of particles from the shield into the tool.

8. A powder actuated fastener driving tool according to claim 7 wherein the shield means is longitudinally movable with respect to the barrel means and engagement of the annular lip with the cap means provides a forward stop for the shield means and including spring means for urging the shield means forwardly with respect to the barrel means.

9. A powder actuated fastener driving tool comprising housing means, barrel means mounted in the housing means having a muzzle end projecting therefrom, deflector shield means surrounding the muzzle end and adapted

to engage a surface into which a fastener is to be driven, sleeve means affixed to the shield means and surrounding the barrel means supporting the shield means for angular motion with respect thereto and to the housing means, means forming a plurality of angularly disposed recesses in the outer surface of the sleeve means, and detent means affixed to the housing and engageable selectively in any of the recess means to releasably retain the shield means in any of a plurality of selected angular positions with respect to the housing means.

10. A powder actuated fastener driving tool according to claim 9 wherein the sleeve means supports the shield means for longitudinal motion with respect to the housing means and the recesses comprise longitudinal grooves in the outer surface of the sleeve means.

11. A powder actuated fastener driving tool comprising housing means including a generally tubular rear housing member and a generally tubular front housing member adapted to be held in aligned and abutting relation, barrel means supported for limited rotative and longitudinal movement in the front housing member, breech block means supported in the rear housing member for limited longitudinal movement and in fixed angular relation with respect thereto, connecting means associated with the breech block means and the barrel means requiring relative rotation thereof, the end of the front housing member adjacent to the rear housing member having an angular slot formed therein and the rear housing member having a longitudinal slot formed therein extending from one end of the angular slot in the front housing member, and radial pin means affixed to the barrel means and movable in the angular slot between a first position aligned with the longitudinal slot wherein the barrel means and the breech block means are connected together, thereby permitting longitudinal motion thereof within the housing means, and a second position remote from the first position wherein the barrel means and the breech block means are disconnected.

12. A powder actuated fastener driving tool according to claim 11 including spring means urging the breech

block means forwardly in the rear housing member, and abutment means mounted externally of the housing means having a projection extending into the interior of the rear housing member operatively associated with the breech block means to limit the forward motion thereof, the abutment means being removable from the housing means to permit the breech block means to be withdrawn from the rear housing member.

13. A powder actuated fastener driving tool according to claim 12 wherein the breech block means is longitudinally movable between a forward position and a rear position with respect to the housing means and has a longitudinal passage and including firing pin means receivable in the longitudinal passage, spring means urging the firing pin means forwardly with respect to the housing means, sear means mounted on the breech block means having a first portion normally aligned with the firing pin means and a second portion, and trigger means pivotally supported on the housing means having a projecting part movable into the housing means when the trigger means is actuated, the projecting part of the trigger means being aligned with the second portion of the sear means when the breech block means is in its rear position with respect to the housing means, the breech block means being formed with a recess positioned to receive the projecting part of the trigger means when the breech block means is in its forward position in the housing means, thereby preventing rearward motion of the breech block means when the trigger means is actuated.

14. A powder actuated tool according to claim 13 including connecting means between the two housing portions comprising a handle member pivotally joined to the front housing member and removably connected to the abutment means on the rear housing portion.

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