MAGNETIC FASTENER POSITIONING MEANS FOR EXPLOSIVELY ACTUATED FASTENER DRIVING TOOLS
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5 Claims. (Cl. 1—44.5)

The present invention relates to stud driving tools for installing a stud in a concrete or metal wall surface by explosion of an explosive charge, and is concerned more particularly with a tool employing control of the effective power or force of a standard explosive charge of constant magnitude to obtain different sizes of combustion chamber. In accordance with the instant invention, the stud construction is simplified by employing a magnetic positioning means which can be moved along the barrel of the tool to effect a magnetic propelling and holding effect on the stud and to vary its spacing from the cartridge at the breech end of the barrel and thereby vary the force of the explosive charge.

The above and other objects of the invention are obtained as described in connection with a preferred embodiment thereof as illustrated in the accompanying drawings, in which:

Figure 1 is a side elevational view partly in section of a stud driving tool employing the invention.

Figure 2 is a fragmentary side elevational view of the tool partially in section showing further features of the tool.

Figure 3 is a fragmentary sectional view taken in a plane indicated by the line 3—3 in Figure 1.

Tools of the general character employed in the instant invention are shown in the copending application of Bronzington and Erickson, Serial No. 430, 283, filed May 17, 1954, and issued as U. S. Letters Patent No. 2,773,259, on December 11, 1956, and reference is made to this disclosure for portions of the tool not specifically described herein.

In general the tool comprises a barrel 10 housed telescopically within a housing or body 11 and having its breech end terminating adjacent a firing pin block 12 slidably mounted in a handle portion 17 of the tool. A firing pin 13 is mounted in the block 12 and is restrained by a firing pin latch 14. The latch 14 is released under control of a trigger 16 suitably mounted in the handle portion 17 of the tool. At the breech end of the barrel 10 a conventional blank cartridge 18 may be mounted in the bore of the barrel and a conventional type cartridge ejector 19 is provided.

Preferably the barrel 10 is made of non-magnetic material, such as stainless steel, and about the barrel 10 and secured thereto there is provided a breech block 21 slidably mounted in the housing 11 and is pivotally connected by pin 22 to suitable forward extensions 12a of the block 12. This breech block 21 has an annular recess 23 surrounding the barrel adjacent its breech end, and is slotted at 24 to provide a vertical slot communicating with this annular recess 23. The housing 11 is suitably slotted at 26 in communicating relation with the slot 24.

Mounted about the non-magnetic barrel 10 is a magnetic sleeve 31 which is positioned to slide freely on the barrel, and has a handle portion 32 extending outwardly beyond the barrel through the slots 24 and 26. This handle portion 32 houses a frictional retaining pin 33 urged by a spring 34 against the barrel 10. The magnetic member or ring 31 may be formed of suitable magnetic material adapted to hold its magnetism permanently, for example the type sold commonly under the trade name "Alnico." The field set up by this magnetic ring or actuator extends within the barrel 11 and will hold the stud 36 at a location, and will also move the stud along the barrel as the magnetic field is moved by translation of the sleeve 31 along the barrel. To gauge the position of the stud within the barrel, graduations 37 (Figure 2) are provided on the housing 11 along one edge of the slot 26 for cooperation with an edge of the handle portion 32.

It will be seen that the stud 36 is of the simplest conventional form having a cylindrical head portion, and a shank of reduced diameter terminating in a tapered sharpened point, this stud being capable of manufacture by economical production methods.

It is believed apparent from the foregoing description, that with the tool broken open, the stud can be inserted into the barrel in proper relation to the field of the magnetic ring or actuator 31, and the blank cartridge 18 can also be inserted. Then by moving the ring 31 employing the handle 32 and the graduations 37 along the barrel 10, the stud will be moved within the barrel to the desired location to obtain the proper combustion chamber size for the desired driving force or effective force of the cartridge 18.

While I have shown and described a preferred embodiment of the invention, it will be apparent that the invention is capable of further variation and modification from the form shown, so that the scope of the invention should be limited only by the scope of the claims appended hereto.

I claim:

1. In a stud driving tool having a body, and a barrel mounted in said body, said barrel being formed of non-magnetic material and having a bore adapted to receive a stud of magnetic material and an explosive charge, the combination with the nonmagnetic barrel of a magnetic positioning member slidably mounted with respect to said barrel and movable therealong to position the stud within the barrel at a desired selected position.

2. A stud driving tool as recited in claim 1 in which the magnetic positioning member has an operating handle extending outside the housing of the tool, and graduations are provided on the housing for cooperation with said handle to indicate the position of a stud.

3. In a stud driving tool having a body, and a barrel mounted in said body, said barrel being formed of non-magnetic material and having a bore adapted to receive a stud of magnetic material and an explosive charge, the combination with the nonmagnetic barrel of a magnetic stud-positioning cylinder mounted in said space above said barrel and sliding thereon, and a handle extending from said cylinder to the exterior of said tool and having means for retaining the cylinder in a selected position along said barrel.

4. A stud driving tool as recited in claim 3 in which the body of the tool is provided with graduations adjacent said handle so as to indicate the desired selected position of the cylinder and a stud held thereby in the barrel.

5. In a stud driving tool having a body, and a barrel mounted in said body, said barrel being formed of non-magnetic material and having a bore adapted to receive a stud of magnetic material and an explosive charge, means forming an annular space around the barrel, a magnetic stud-positioning cylinder mounted in said space above said barrel and slidably mounted in said space, said element providing a stud holding field within said bore.

References Cited in the file of this patent

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