April 30, 1957 R. W. MAGNUSON 2,790,174

MAGNETIC FASTENER POSITIONING MEANS FOR EXPLOSIVELY ACTUATED FASTENER DRIVING TOOLS

Filed Oct. 4, 1954

FIG. 1.

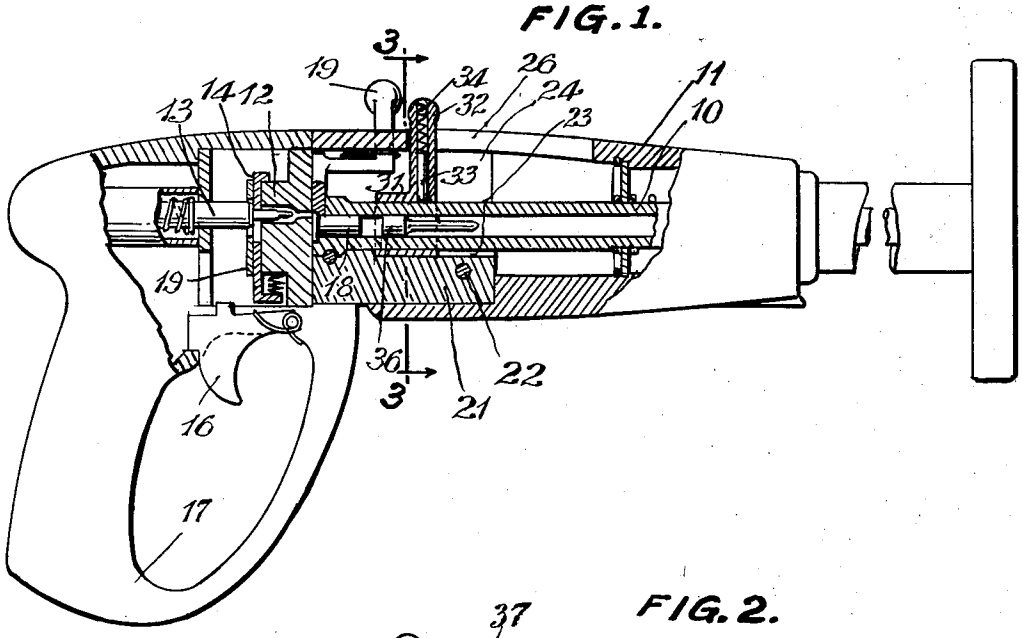


FIG. 2.

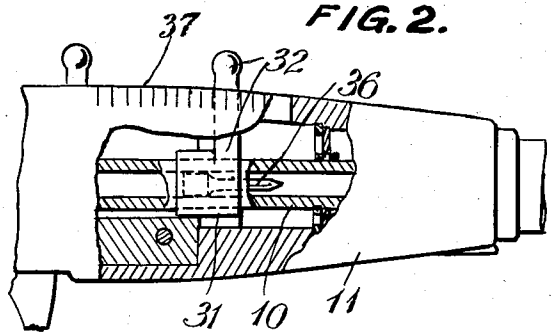
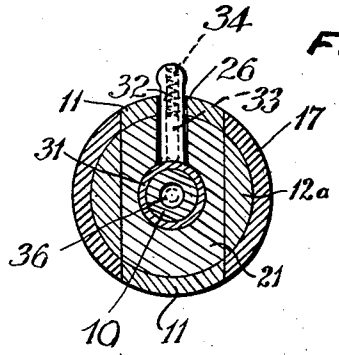


FIG. 3.



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MAGNETIC FASTENER POSITIONING MEANS FOR EXPLOSIVELY ACTUATED FASTENER DRIVING TOOLS

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Application October 4, 1954, Serial No. 459,993

5 Claims. (Cl. 1—44.5)

The present invention relates to stud driving tools for installing a stud in a concrete or metal wall or 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 Broughton and Erickson, Serial No. 430, 288, 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 positioner 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 positioner 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, means forming an annular space around the barrel, a magnetic stud-positioning cylinder mounted in said space about said barrel and slidable 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 a space adjacent the barrel, and a magnetic element slidably mounted in said space, said element providing a stud holding field within said bore.

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