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STUD DRIVING TOOL

Original Filed Dec. 29, 1949

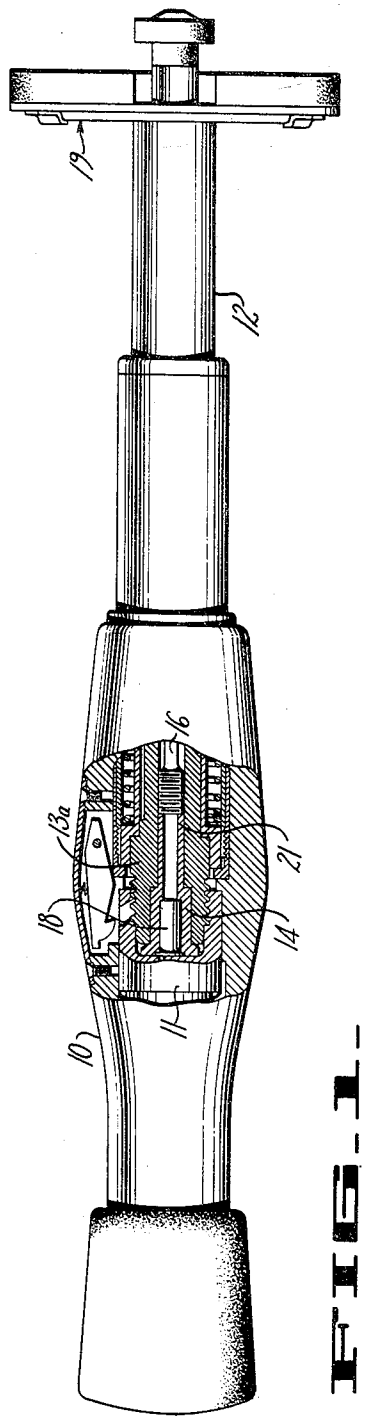


FIG. 1.

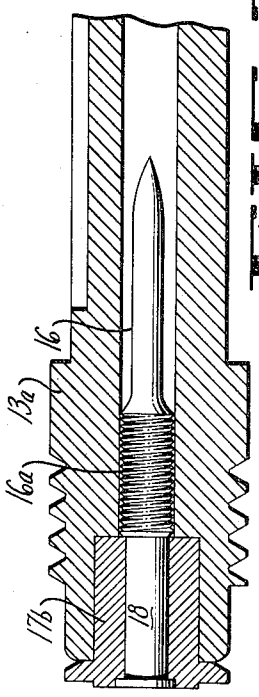


FIG. 2.

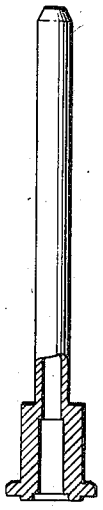


FIG. 4.

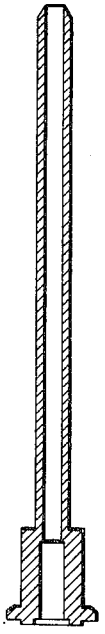


FIG. 3.

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STUD DRIVING TOOL

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Original application December 29, 1949, Serial No. 135,744, now Patent No. 2,722,003, dated November 1, 1955. Divided and this application July 18, 1955, Serial No. 522,746

1 Claim. (Cl. 1—44.5)

This application is a division of our co-pending application, Ser. No. 135,744, filed December 29, 1949, and issued as U. S. Letters Patent No. 2,722,003, on November 1, 1955.

The present invention relates to stud driving tools of the type employed for the explosive installation of studs in various types of concrete and steel structures, and is concerned particularly with methods and apparatus for employing a standard explosive charge by varying the effective force of such charge as applied to the stud to obtain a desired selected force for successful installation of a particular stud in a particular wall surface.

The present invention provides apparatus for varying of the combustion space or chamber in which the explosive charge is exploded and for also varying the spacing of the stud from the muzzle end of the barrel to influence further the energy imparted to the stud by controlling the time during which the stud is subjected to the driving force before emerging from the muzzle end of the barrel.

The above and other objects of the invention are attained in connection with certain preferred embodiments of the invention as disclosed and described in connection with the accompanying drawings, in which:

Figure 1 is an elevational view of a stud driving tool with certain parts broken away and shown in section to illustrate the combustion chamber of the tool.

Figure 2 is an enlarged fragmentary view showing the breech plug unit for obtaining maximum driving force on a stud.

Figures 3 and 4 are views of other sizes of breech plugs for obtaining different effective stud driving forces.

Referring to Figure 1, there is shown a stud driving tool of the character described and claimed in the co-pending applications of Smith and Daugherty, Serial No. 124,078, filed October 28, 1949, for Stud Driving Tool, and Erickson and Bullwinkle, Serial No. 130,818, filed December 2, 1949, now Patent No. 2,679,645, for Stud Driving Tool. In general, stud driving tools of this character are adapted to be separated or broken into two halves including a rear part 10 which contains the various firing control parts including, for example, a firing pin carrier 11, and a front or barrel part 12 of the tool in which the barrel 13 is included. The barrel 13 is provided with an enlarged rear end 13*a* which has a threaded connection within the end of the firing pin carrier 11 to connect the two halves of the tool. The barrel 13 is also provided with an enlarged bore in which a combustion chamber or breech plug insert 14 is provided for positioning the stud 16 to be driven and in which the explosive cartridge 18 is mounted for impact by the firing pin of the firing mechanism. The tool is broken in two halves by unthreading the front part 12 at the threaded connection of the barrel

13 with the firing pin carrier 11 and sliding this part from within the housing of the rear part 10. With the parts disassembled, the breech plug or insert 14 is removed and the selected stud 16 is installed in the barrel, the cartridge 18 is placed in the breech plug 14, and the parts are reassembled as shown in Figure 1 for a firing operation. Firing is accomplished by placing the end of the barrel 13 against the surface into which the stud is to be driven and pressing or telescoping the barrel assembly 12 and the firing pin carrier 11 back into the other part of the tool until a firing position is reached, as disclosed in said applications, and then affecting relative turning movement of the central housing and the end grip to fire the tool. At this time the deflector pad structure 19, yieldably mounted about the barrel 13, is engaged with the surface about the area of engagement of the end of the barrel so as to provide protection from flying particles of the wall surface upon explosive installation of the stud.

As previously stated in accordance with the instant invention, the effective force of the standard explosive charge is varied by positioning the stud at different predetermined distances along the barrel in spaced relation with respect to the muzzle end of the barrel and the cartridge. As a result, at the same time that the volume of the combustion chamber is varied, the effective length of the barrel through which the stud is driven by the explotive charge is also changed, and these two factors are combined in varying the power control in driving the stud.

As seen in Figure 1 the breech plug 14 is provided with a cylindrical extension 21 which extends within and fits closely within the bore of the barrel 13 so that by placing the stud in the barrel and then inserting the breech plug 14, the stud is positioned at a predetermined spacing both with respect to the cartridge 18 and with respect to the muzzle end of the barrel 13. Preferably the stud 16 is constructed to frictionally maintain its position within the barrel, and in the present instance, the stud 16 is knurled or dimpled at 16*a* around its head so that its position in the barrel will be maintained and yet the stud can be driven from the barrel by explosive force of the cartridge 18.

Figure 2 shows the highest power or breech plug 17*b* which has no cylindrical extension so that the stud is positioned immediately adjacent the end of the cartridge 18. Figures 3 and 4 illustrate other breech plugs of the set to select the position of the stud in the barrel.

While we have shown and described certain preferred methods and apparatus for carrying out the invention it will be understood that the invention is capable of variation and modification from the form shown so that its scope should be limited only by the scope of the claim appended hereto.

We claim:

In a stud driving tool, a breech plug insert for transitional mounting in the barrel of the tool, said barrel having a bore, said insert including a portion of larger diameter at one end having a seat for a cartridge and a stud positioning extension of reduced diameter at the other end for insertion into said bore and having a passage communicating with the opening of said seat.

References Cited in the file of this patent

UNITED STATES PATENTS

2,395,354	Temple	Feb. 19, 1946
2,533,851	Temple	Dec. 12, 1950
2,549,993	Temple	Apr. 24, 1951