J. C. GLENZER.

DRILL AND TAP DRIVER.

APPLICATION FILED JUNE 20, 1917.

1,304,473.

Patented May 20, 1919.

Fig. 1.

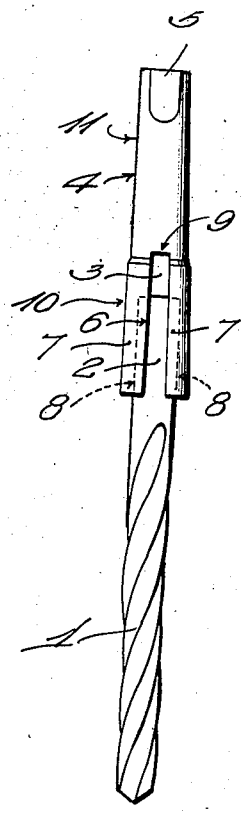


Fig. 2.

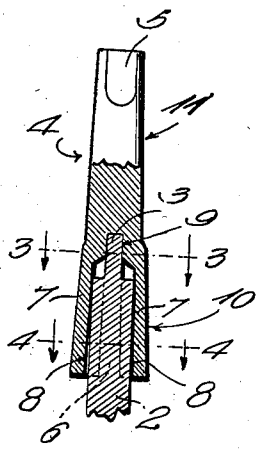


Fig. 3.

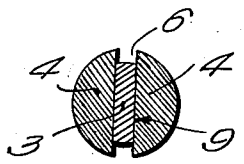


Fig. 4.

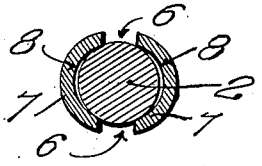
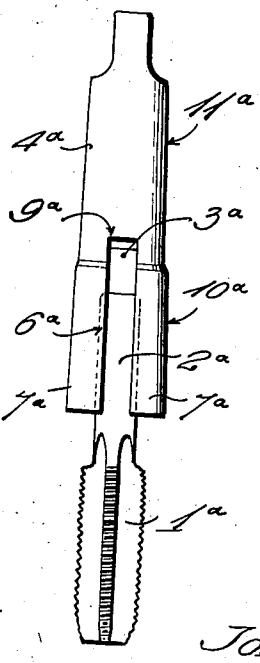


Fig. 5.

Fig. 6.



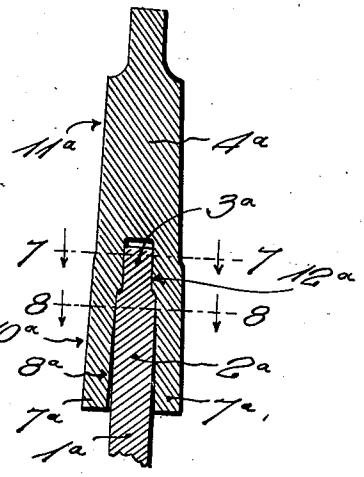


Fig. 7.

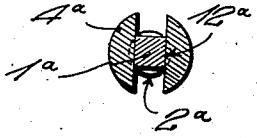
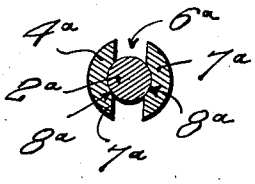


Fig. 8.



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UNITED STATES PATENT OFFICE.

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DRILL AND TAP DRIVER.

1,304,473. Specification of Letters Patent. Patented May 20, 1919.

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To all whom it may concern:

Be it known that I, JOHN C. GLENZER, a citizen of the United States, residing at Highland Park, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Drill and Tap Drivers, of which the following is a specification.

This invention relates to improvements in drill and tap drivers, and more particularly to improvements in drills, taps and similar tools of this character and drivers therefor, whereby the tool may be firmly and securely held for working action in its driver while the construction is such as to permit it to be applied and removed with facility.

The object of the invention is to provide a driver which is adapted to hold a tool against any possibility of independent rotation and displacement without the use of auxiliary fastenings of any kind, whereby simplicity of construction is secured, expense of manufacture reduced, and complication and liability of loss and derangement of extra fastening parts avoided, and further to provide a fastening connection which permits the tool to be applied and removed without the use of an auxiliary tool.

With these and other objects in view, the invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawing, in which:—

Figure 1 is a view of a drill and driver therefor, showing the drill inserted for use.

Fig. 2 is a longitudinal section of the same.

Figs. 3 and 4 are transverse sections on lines 3—3 and 4—4 of Fig. 2.

Figs. 5 to 8, inclusive, are views similar to Figs. 1 to 4, inclusive, showing the embodiment of the invention in a tap and tap driver.

In the embodiment of my invention shown in Figs. 1 to 4, inclusive, in which I have illustrated its application in particular to a drill bit and its driver, 1 designates the drill bit provided, as usual, with a circular shank 2 terminating in a reduced, flat angular tang 3, said shank and tang being adapted to fit within the driver 4.

The driver 4 is provided with a body portion of circular form in cross section and terminating at one end in a reduced tang or extension 5, the opposite end of the driver being provided with a slot 6 extending diametrically through the same from side to side and through the outer end thereof. The formation of the slot 6 bifurcates the bit receiving end of the driver to form a pair of spring clamping jaws 7, which are coextensive in length with the length of the slot, but are provided upon their inner faces with longitudinally extending receiving grooves 8, of less length than the slot. The grooves 8 are of segmental form in cross section, and curved on arcs to fit opposite sides of the shank 2 of the bit 1, the slot and grooves thus forming a socket to receive the shank and tang of the bit. By reason of the fact that the grooves 8 are of less length than the slot and terminate some distance in advance of the rear wall thereof, a contracted portion 9 is formed in rear of the bit receiving socket to receive the angular flattened tang 3 of the bit, the walls of said contracted portion 9 being flat for engagement with the flattened sides of the tang 3, whereby when the bit is fitted in position in the driver the co-acting flattened surfaces of the tang and side walls of the rear portion of the slot will hold the bit firmly and securely fixed against rotation in the driver.

The outer surface of the driver is provided with a Morse taper as usual to fit the tool holder of the machine, but this taper in accordance with my invention, is graduated, the driver being provided with an outer tapered portion 10 and an inner tapered portion 11 of different degrees. The outer tapered portion 10, which may be of the usual degree taper, extends from the outer ends of the jaws 7 to a point short and in advance of the rear end of the slot 6, while the tapered portion 11, which is reduced with respect to the portion 10 and of a less degree of taper, extends from the rear end of the body of the driver to a point in advance of the rear wall of the slot 6 and preferably intersecting the rear or inner end of the tapered portion 10. By this construction, while the usual taper of the driver is preserved, the jaws 7 are attenuated or reduced at their inner or rear ends to increase their resiliency and thus adapt them to be closed with facility into gripping engagement with the shank of the bit when inserted into the socket.

In practice, the curved faces of the jaws are preferably formed on arcs of a circle of

a diameter slightly less than that of the shank 2 of the bit, whereby in the operation of inserting the bit the jaws must be spread or forced to a slight degree apart, thus adapting them to exert a spring gripping action to hold the bit in place. This gripping action, supplemented by the increased gripping action, due to the pressure on the jaws when the driver is inserted in the tool holder, will serve to clamp the bit with a degree of force sufficient to hold it firmly in place against any possibility of longitudinal movement. The gripping action of the jaws on the bit is further supplemented by the bearing action of the flattened rear or angular walls 12 of the portion 9 of the slot against the flat surfaces of the tang 3 to effectually hold the bit from any tendency to turn or rotate in the driver.

It will thus be seen that the invention provides a construction of driver and bit whereby provision is made for holding the bit in the driver against both longitudinal and axial movements in a simple, reliable and efficient manner, and without the necessity of employing auxiliary clamping members or fastenings or in any way adding extra parts to the driver. Simplicity and inexpensiveness of construction is thus obtained and the use of parts liable to get out of working order entirely obviated.

In Figs. 5 to 8, inclusive, I have shown the adaptation of the invention to a tap and its driver, the principle of construction being the same and the construction differing only in slight respects according to variations in the form of the tools. As shown, 1^a designates the tap having a circular shank 2^a terminating in the tang 3^a which is square in cross section, while 4^a designates the driver which is provided with the same general features of construction as the driver 4, said driver 4^a having the slot 6^a, jaws 7^a, grooves 8^a, slot portion 9^a, tapered surfaces 10^a and 11^a, and bearing walls 12^a, which are the same as those disclosed in Figs. 1 to 4, inclusive, with the exception that the grooves 8^a are comparatively narrow and shallow and the portion 9^a of the slot is deeper to suit the conformation of the portions 2^a and 3^a of the tap. In each form of the invention the mode of operation is essentially the same.

While I have particularly set forth the use of the invention in connection with drill bits and taps and drivers therefor, it is to be understood that I do not limit the invention thereto, as the same principle of construction may be employed in connection with tools and drivers adapted for other kinds of work but having the same general features of construction.

Having thus fully described my invention, I claim:

1. A tool driver comprising a body having a slot extending diametrically therethrough at one end thereof and bifurcating such end portion, forming jaws having opposing faces to clamp the tool between them, said body being longitudinally tapered to a coarse degree from the outer ends of the jaws to a point in advance of the inner ends of the jaws, and thence tapered to a finer degree toward the opposite end of the body.

2. A tool driver comprising a body having a slot extending diametrically therethrough at one end thereof and bifurcating such end portion, forming jaws having opposing faces, the outer portions of the inner faces of the jaws being provided with grooves and the inner portions of said faces of the jaws having flattened stop surfaces, said body being longitudinally tapered to a coarse degree from the outer ends of the jaws to a point in advance of the inner ends of the jaws, and thence tapered to a finer degree toward the opposite end of the body.

In testimony whereof I affix my signature.

JOHN C. GLENZER.