

W. F. STRAUB.
 INTERCHANGEABLE TOOL HOLDER.
 APPLICATION FILED JUNE 16, 1917.

1,307,937.

Patented June 24, 1919.

Fig. 1.

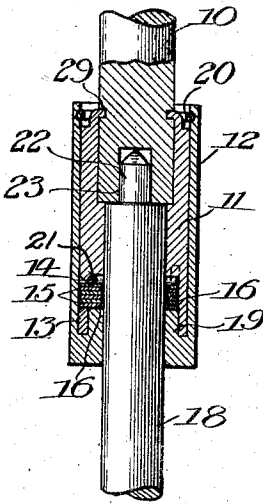


Fig. 2.

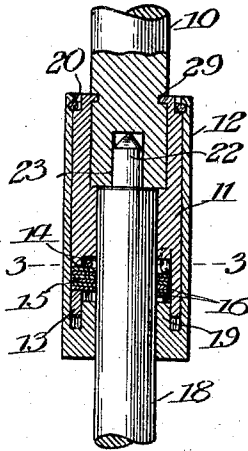


Fig. 3.

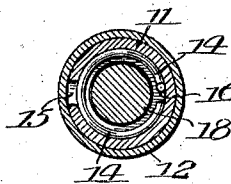


Fig. 5.

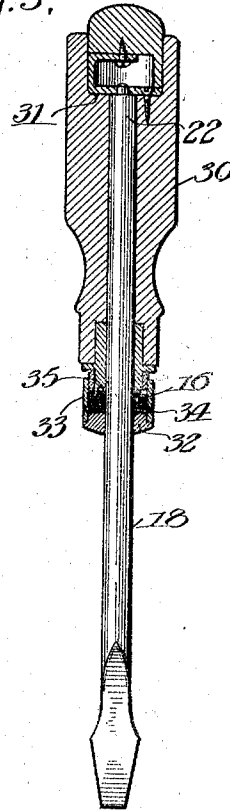


Fig. 4.

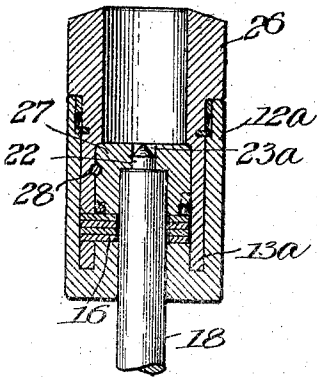


Fig. 6.

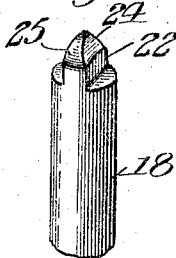
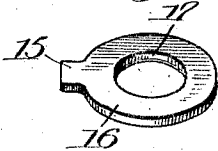


Fig. 7.



Inventor
 William F. Straub
 by May W. Fabel atty.

UNITED STATES PATENT OFFICE.

WILLIAM F. STRAUB, OF CHICAGO, ILLINOIS.

INTERCHANGEABLE-TOOL HOLDER.

1,307,937.

Specification of Letters Patent.

Patented June 24, 1919.

Application filed June 16, 1917. Serial No. 175,050.

To all whom it may concern:

Be it known that I, WILLIAM F. STRAUB, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Interchangeable-Tool Holders, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to interchangeable tool sockets, and has for its object the provision of an improved socket of this nature which is adapted to receive different kinds of tools and to lock them in position. The locking means is more or less automatic in its nature and one of the desirable features due to the use of my invention resides in the fact that the socket may be rapidly rotating as, for instance, upon a drill spindle, and still be capable of receiving the drill or other tool which it is desired to introduce into position so that the machine need not be stopped in its operation to insert the desired tool. This introduction of the tool while the socket or spindle is revolving can be done without endangering in any manner the operator who is introducing the tool.

My invention is furthermore of great value in that tool handles may be provided with my improved socket structure so that they are adapted interchangeably to receive different kinds of tools.

I will explain my invention more in detail by referring to the accompanying drawing, in which—

Figure 1 is a longitudinal sectional view of a socket structure constructed in accordance with my invention, the tool being shown in position, the socket being in such condition as to permit removal of the tool;

Fig. 2 is a similar view showing the socket in its locked condition;

Fig. 3 is a sectional view on line 3—3 of Fig. 2;

Fig. 4 is a view somewhat similar to Fig. 1 showing a different style of socket structure;

Fig. 5 is a view similar to that of Fig. 1 showing the device as applied to a tool handle;

Fig. 6 is a perspective view of the socket engaging extremity of a tool,

Fig. 7 is a perspective view of one of the locking rings, and

Fig. 8 is a sectional view of one of the locking rings.

Referring more particularly to Fig. 1, I show what might be a drill spindle 10. This drill spindle is not shown in connection with the ordinary drilling machine as such association is not thought necessary for a correct understanding of the structure herein. The spindle 10, of course, is adapted for rotation and is in practice suitably rotated. This spindle carries my improved socket structure having the body portion 11 and the slidable collar 12 which surrounds it. The body portion 11 has a downwardly extending annular ring portion 13 which is partly cut away at 14 to accommodate projections 15 forming parts of locking rings 16. These locking rings are shown more in detail in Fig. 7. The locking rings have central openings 17 slightly larger in diameter than the outer diameter of the tool 18. These locking rings 16 are held in place by the projections 15. The collar 12 has a concentric upwardly extending ring 19 which enters within the ring 13. This slidable collar 12 is normally placed downwardly into the position shown in Fig. 2 by the coiled spring 20. A coiled spring 21 also normally tends to push the locking rings 16 into the position shown in Fig. 2.

Now, when the slidable collar 12 is pulled upwardly, as shown in Fig. 1, then the locking rings 16 are in such shape that their inner periphery will not bind on the tool 18 and it can thus be readily inserted. The construction is also preferably such that the insertion of a tool actually pushes the rings into the position shown in Fig. 1 so as to permit of the ready insertion of the tool. Now, when it is attempted to draw the tool downwardly after it has once been introduced, then the locking rings by reason of their downward tilt bind the tool in position and prevent its withdrawal. The movement of the locking rings from free position to binding position is so small that it is hardly perceptible to the hand when inserting the tool.

I use a plurality of rings in general in that there are thus a great plurality of binding points in view of the restricted diameter

of the tool. The upper extremity of the tool has a lug 22 which enters a recess 23 provided in the drill spindle which prevents the tool from rotating relatively to the 5 socket. The rings 16 prevent withdrawal of the tool and the lug 22 prevents its rotation so that the tool is held in its proper position and will rotate with the spindle 10. The lug 22 likewise has tapered sides as shown at 24 10 and tapered ends as shown at 25 so that the tool can be inserted even though the socket is rotating rapidly.

Now, when it is desired to remove the tool, then the collar 12 is pushed upwardly 15 against the action of the spring 20 into the position shown in Fig. 1, whereupon the tool 18 can be readily withdrawn.

In Fig. 4, I show a structure similar to that of Fig. 1 except that it is a chuck construction, there being provided the shank 26 having the downwardly extending annular ring 13^a. Interiorly of the shank 26 there is provided a socket portion 27 having the opening 23^a to receive the projection 25 22 of the tool, this socket portion 27 being pinned in place by the pin 28. In all other respects this structure is practically the same as that outlined for Fig. 1. In Fig. 1 the body portion 11 is held in place on the 30 spindle 10 by means of projections 29.

In Fig. 5 I show a tool handle 30 having at its upper extremity the metallic portion 31 adapted to receive the extremity 22 of the tool 18, the locking portion being at the 35 front extremity of this handle and including the rings 16 which are again suitably held in position within the body portion 32 provided at the extremity of this handle. A surrounding collar 33 is adapted to receive 40 the projection 34 of at least the lowermost ring 16, thus to move the rings into their upward locking position against the action of the spring 35.

It will thus be seen that I have provided 45 a tool handle which holds a tool against withdrawal at a plurality of engaging points, the rings securely locking the tool in position. The locking of the tool in position is practically automatic in its nature. 50 The structure as explained is also such that

a tool may be inserted into a rapidly rotating drill spindle, chuck or tool holder without endangering the operator.

By referring more particularly to Fig. 1, another advantage of this form of construction will be readily apparent, namely that with the spindle 10 revolving rapidly the collar 12 can be held by hand against rotation so that it is possible for the operator to easily align the tool 18 with the opening 60 in the lower extremity of the collar, thus making it possible to insert the tool properly aligned without danger to the operator. Of course, the minute the projection 22 engages the slot 23 the tool 18 will begin to 65 revolve, but the operator of course at that time has released his grasp of the tool, and automatically the devices 16 have locked the tool against withdrawal.

By referring more particularly to Fig. 3, 70 it will be seen that the locking ring 16 has its lower periphery at the hole 17 rounded as shown at 36, and has a sharp corner 37 at the upper periphery around the hole 17. This rounded portion permits easy entry of 75 the tool, whereas the sharp portion is used for gripping the tool and holding it in its locked position.

From what has been thus described the nature of my invention will be clear to those 80 skilled in the art.

What I claim as my invention is:

An interchangeable tool holder comprising a socket portion having means whereby it is adapted to receive the shank portion of 85 a tool and hold it against rotation, a plurality of tiltable gripping means adapted when in operative position to prevent longitudinal movement of the tool shank, and a collar adapted when actuated to restore said 90 gripping means to permit withdrawal of said tool, said collar having an annular holder-encircling extension whereby it may be effectively manipulated.

In witness whereof, I hereunto subscribe 95 my name this 12th day of June, A. D., 1917.

WILLIAM F. STRAUB.

Witnesses:

MAXE W. ZABEL,
HAZEL A. JONES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."