(No Model.)

G. BETTCHER.

SAFETY SOCKET FOR TAPS OR DRILLS.

No. 572,099. Patented Dec. 1, 1896.

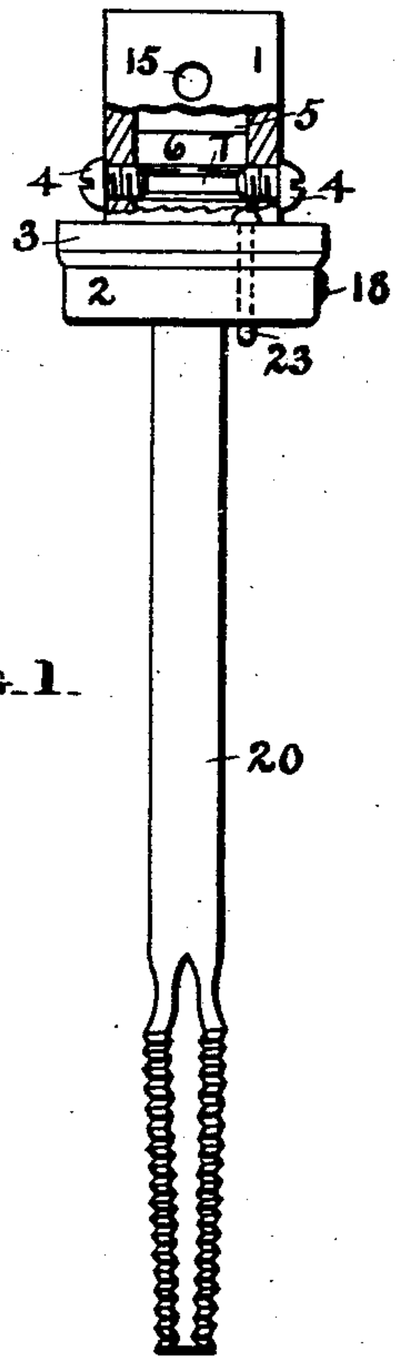

FIG. 1.

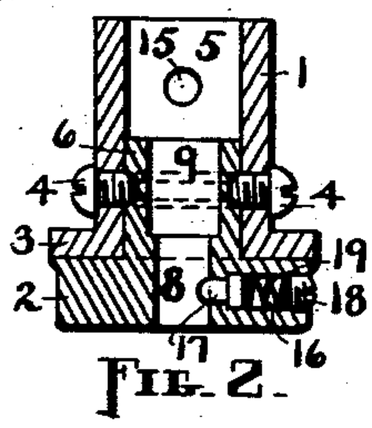

FIG. 2.

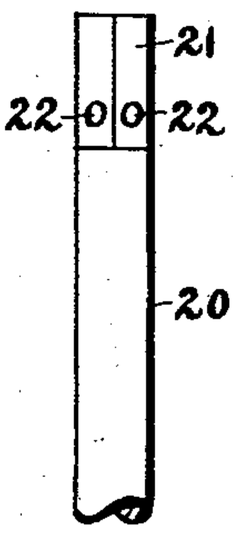

FIG. 3.

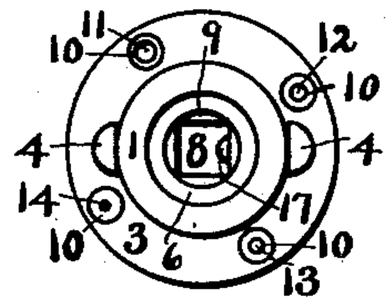

FIG. 4.

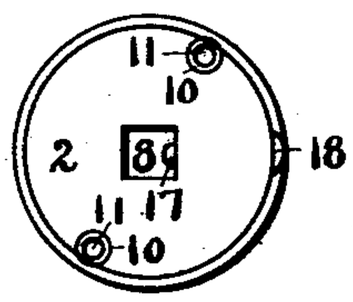

FIG. 5.

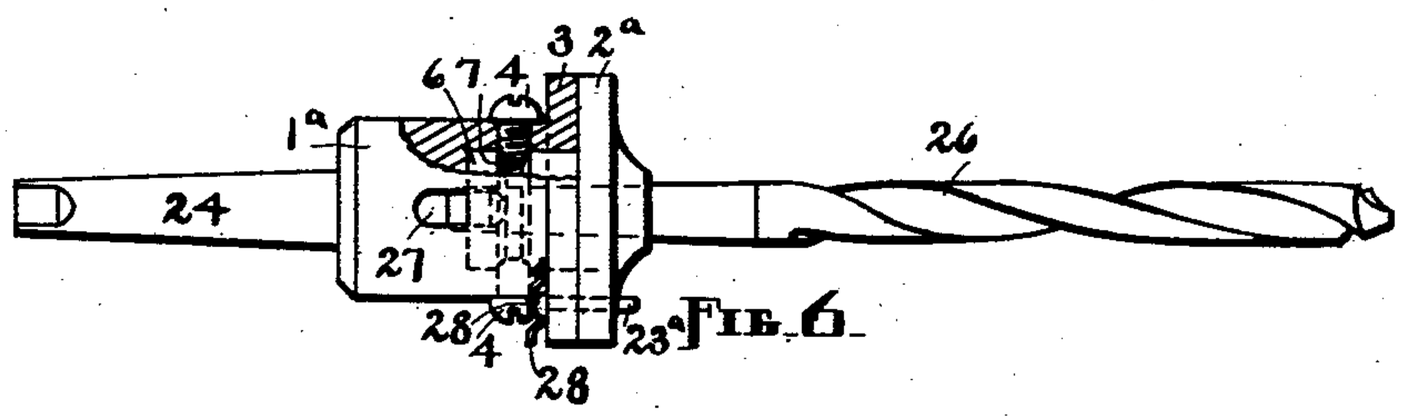

FIG. 6.

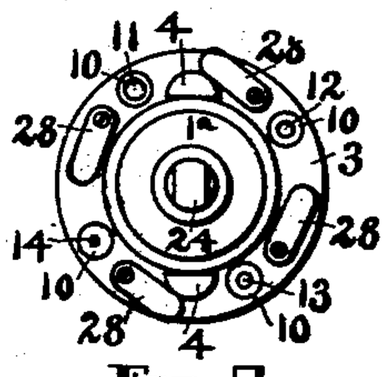

FIG. 7.

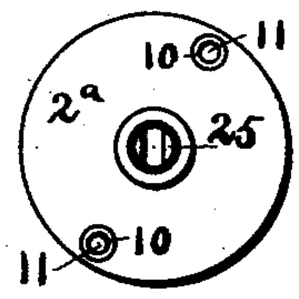

FIG. 8.

WITNESSES:

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UNITED STATES PATENT OFFICE.

GOTTLIEB BETTCHER, OF CLEVELAND, OHIO.

SAFETY-SOCKET FOR TAPS OR DRILLS.

SPECIFICATION forming part of Letters Patent No. 572,099, dated December 1, 1896.

Application filed June 5, 1896. Serial No. 594,451. (No model.)

To all whom it may concern:

Be it known that I, GOTTLIEB BETTCHER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Safety-Sockets for Taps or Drills, of which the following is a full, clear, and exact description.

My invention relates to sockets for holding taps or drills in a lathe or other machine; and it consists of the several parts and combinations of parts hereinafter fully described and especially claimed.

The object of my improvement is to provide a socket or sockets of the class designated above which prevent the breaking of taps and drills. Many taps and drills are twisted apart and rendered useless in the operation of tapping and boring, but my invention overcomes this trouble and consequently saves much time, money, and vexation. The tools are quickly and easily attached to or detached from the sockets, which are themselves readily connected to the machine or disconnected therefrom. The peculiar construction of the tap-socket enables the tap to be automatically detached from said socket when the string of nuts exceeds in length that of said tap, as will be explained in full hereinafter. A further saving in expense results from the fact that a part of the socket is universal, it being necessary to change only the other part for the accommodation of different sizes of tool-heads, as will appear more fully in the following description.

That my invention may be seen and fully understood by others, reference will be had to the following specification and annexed drawings, forming a part thereof, in which—

Figure 1 is a side view, in partial section, of the tap-socket having a tap attached thereto; Fig. 2, a central vertical section of said socket; Fig. 3, a view of the upper part of said tap; Fig. 4, a top view of said socket; Fig. 5, a bottom view of the same; Fig. 6, a side view, in partial section, of the drill-socket having a drill attached thereto; Fig. 7, a rear end view of said socket, and Fig. 8 a front end view of the same.

Similar figures of reference designate like parts in the drawings and specification.

Since there is some difference in construction between the socket employed for holding taps and that used for drills, it will be necessary to describe the two separately, and I will begin with the tap-socket and tap illustrated in the first five figures of the accompanying drawings.

The tap-socket consists principally of the sleeve 1 and the holder 2. The sleeve 1 has the flange 3 at its lower end and is provided with the screws 4 4, which are located opposite each other above said flange. The ends of the screws 4 project into the passage 5, which extends through the sleeve 1. More or less than two screws 4 may be employed, if desired. The holder 2 has the spindle 6, in the periphery of which is the annular groove 7. The spindle 6 is inserted in the passage 5 and the holder 2 is revolubly held against the base of the sleeve 1 by the screws 4, which enter the groove 7. The rectangular passage 8 appears in the center of the holder 2 and opens into the annular passage 9 in the spindle 6.

Four steel bushings 10 are set into the flange 3 and have therein the holes 11, 12, 13, and 14, each smaller than the preceding, beginning with 11. Two steel bushings 10 are set into the holder 2, in which are the holes 11 of the same size as the largest hole in the flange 3. The centers of all of the holes just described are equidistant from the center of the sleeve 1. In the upper end of the sleeve 1 are two holes 15 to receive an instrument for driving said sleeve off of the power-spindle of the lathe or other machine.

At right angles to the axis of the holder 2 is the passage 16, extending from the periphery of said holder to the passage 8. The inner terminal of the passage 16 is constricted to form a shoulder for the reception of the head of the pin 17, and the end of said pin projects into the passage 8. The screw 18 closes the outer terminal of the passage 16, and the spiral spring 19 is interposed between said screw and the head of the pin 17, thereby normally forcing said pin inward with its end extending into the passage 8, as above stated. The tap 20 has the rectangular head 21, in which are one or more depressions 22, arranged to register with the pin 17 when said tap is attached to the socket. The head 21 of the tap 20 is a little smaller than the passage 8, into which it is inserted and forced by

the pin 17 as far as the shoulder formed by said head and the shank of said tap will permit, when said pin enters the corresponding depression 22 and prevents the tap from falling out of the socket. The passage 8 may have more or less than four sides provided it conforms to the tap-head.

The pin 23 passes through the hole 13 in the flange 3 and the corresponding hole 11 in the holder 2 and prevents the turning of one upon the other. Now when motion is imparted to the sleeve 1 the holder 2 and tap 20 are revolved with said sleeve unless a tough place is encountered in the metal in which said tap is working, when said pin breaks instead of the tap and the sleeve continues to revolve without the holder and tap. The sleeve is then stopped, a new pin inserted in place of the broken one, the tap withdrawn from the metal in which it would have otherwise been twisted asunder, and operation resumed. The pins vary in size to fit the holes in the flange 3, thus providing for different strengths to match the different sizes of taps, and the two holes in the holder 2 allow a pair of pins to be used, if necessary, but ordinarily one is sufficient. The pin selected for use with a given size of tap must be of a size which has been found to break under a little less strain than is necessary to break the tap.

When tapping nuts and the tap 20 becomes full, the downward pressure of the nuts will draw the tap out of the holder 2 instead of breaking said tap, as often happens when it is attached to the ordinary chuck. The tap 20 is forcibly withdrawn by hand from the holder 2 in a similar manner to that in which it is inserted therein.

The drill-socket shown in Figs. 6, 7, and 8 consists principally of the sleeve 1^a and the holder 2^a. The sleeve 1^a has the tapering spindle 24 at the rear end for insertion in a chuck on a lathe or other machine and the flange 3 at the front terminal. The holder 2^a is provided with the spindle 6, which enters a suitable passage in the sleeve 1^a, said spindle having the annular groove 7. The holder 2^a is revolubly attached to the sleeve 1^a by the screws 4 4, threaded to openings in said sleeve and entering the groove 7. Both the flange 3 of the sleeve 1^a and the holder 2^a are provided with the steel bushings 10, in which are the holes 11, 12, 13, and 14, as in the tap-sleeve flange and holder. The tapering passage 25 appears in the center of the holder 2^a to receive the tapering shank of the drill 26, and the inner end of said passage is contracted to hold the flattened head of said drill and prevent the tool from turning in said holder. The transverse slot 27 is made in the sleeve 1^a for inserting an instrument to drive out the drill 26. The pin 23^a serves the same purpose in connecting the drill-socket holder 2^a to the flange 3 as the pin 23 in the tap-socket.

Since the drill 26 is operated in a horizontal position, it is necessary to have the spring-clasps 28, corresponding in number to the holes in the flange 3 of the sleeve 1^a, attached to said flange for holding the pins in place. The clasp 28 adjacent to the pin 23^a is turned over the head of said pin and prevents it from working out. When the tap-socket is operated horizontally, it should be equipped with the clasps 28, and said clasps may be omitted from the drill-socket if the latter is intended for vertical use only.

The different sizes of tap-heads require as many holders 2, constructed with passages adapted to accommodate said heads, but only one sleeve 1 is necessary to receive the various holders, and the same is true in regard to the drill-heads, holders 2^a, and sleeve 1^a. By turning the screws 4 in the sleeve 1 (or 1^a) until their ends clear the groove 7 the holder 2 (or 2^a) may be detached from said sleeve to be replaced by another, after which said screws are reseated.

It is obvious that the same means of attaching the drill to the socket may be employed as that for the tap by constructing the drill with an angular head, and by making the tap-head like the present drill-head the tap could be used in the drill-socket, but the forms shown and previously described are considered to be the better.

What I claim as my invention, and desire to secure by Letters Patent, is—

In a safety-socket for taps and drills, the following elements in combination; a sleeve 1 provided with an annular flange 3 at one end, a tool-holder 2 provided with the spindle 6 rotatable within said sleeve 1, an annular groove 7 in the periphery of said spindle, screws 4 engaging said sleeve and spindle, a series of holes 11, 12, 13, and 14 in the flange 3 concentric to the axis thereof, each of said holes being provided with a steel bushing 10, and a breakable pin 23 engaging one of said series of holes and entering a coincident hole in the flange of the holder 2, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GOTTLIEB BETTCHER.

Witnesses:

F. A. CUTTER,

H. H. MUNN.