

April 22, 1952

F. M. MARSHALL
SAFETY FRICTION TOOLHOLDER

2,593,907

Filed May 31, 1949

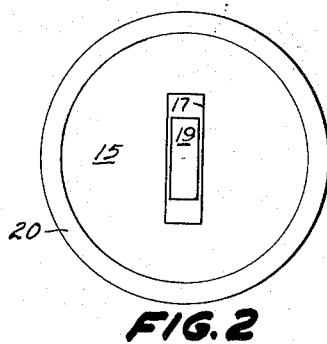


FIG. 2

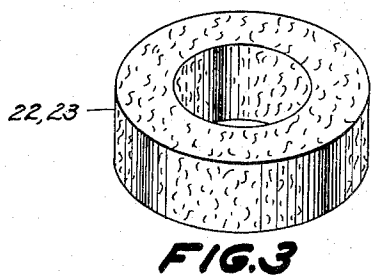


FIG. 3

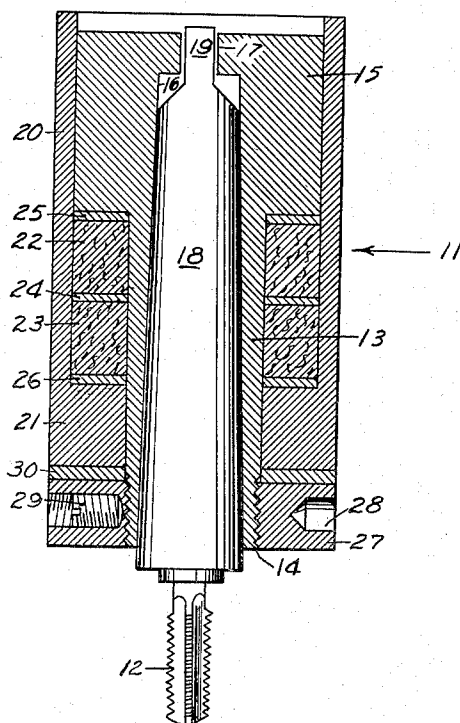


FIG. 1

INVENTOR.
FRANK M. MARSHALL
BY
Stanley C. Binick
ATTORNEY

UNITED STATES PATENT OFFICE

2,593,907

SAFETY FRICTION TOOLHOLDER

Frank M. Marshall, Green Bay, Wis.

Application May 31, 1949, Serial No. 96,361

6 Claims. (Cl. 279-1)

1

This invention relates to improvements in tool holders, and in particular to a safety friction type of tool holder that embodies friction elements that slip when the tool is subjected to damaging torsional forces.

This particular type of tool holder is adapted to be secured in the turret of lathe and functions to hold tools for tapping through holes and bottom bores, drilling, reaming, stud setting, nut setting, spot facing, counter-boring and the like, but will yield its grasp to permit said tools to slip when the tool encounters any obstruction to its movement which would cause it to break, such as a tap when it reaches the bottom of a bore, or when a drill reaches a hardened portion in a piece of stock.

The purpose of this invention is to provide an improved type of safety friction tool holder that is of a very simplified construction, is more compact and of less dimensions than such tool holders heretofore customarily employed for this purpose. It allows the turret and the material worked on to be associated in close quarters thereby providing a rigidity of set-up not heretofore realized.

Devices of this general type known to the art comprise a multiplicity of parts, require expensive and time consuming machining, and are of relatively elongated construction increasing the span between the turret and the material worked on resulting in the introduction of harmful tool deflections.

It is an object of this invention to provide a safety friction tool holder that embodies telescopically related parts.

It is another object of this invention to provide a safety friction tool holder that embodies annular friction elements between interlocking flanges on telescopically related sleeves.

It is still another object of this invention to provide a safety friction tool holder construction that embodies annular fibre elements disposed to surround the shanks of tools held thereby.

It is a further object to provide a safety friction tool holder that is of simple and practical construction, which is efficient and reliable in performance, relatively inexpensive to manufacture, and otherwise well adapted for the purposes for which the same is intended.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accom-

2

panying drawings in which like reference numerals designate like parts throughout the figures thereof and wherein:

Fig. 1 is a longitudinal sectional view of the invention showing the preferred construction;

Fig. 2 is a top view of the invention; and

Fig. 3 is an isometric view of an annular fibre friction element embodied in the preferred construction.

Referring now to the drawings, wherein like reference numerals designate like or corresponding parts throughout the several views, there is shown in Fig. 1 which illustrates a preferred embodiment, a tool holder generally indicated at 11 adapted to be secured in the turret of a lathe (not shown), and a tap tool 12 held by said tool holder.

The tool holder 11 comprises a steel tubular socket member 13 having threads 14 on one end and an enlarged outwardly projecting flange portion 15 on the other end thereof. The inner periphery of tubular socket member 13 is tapered as at 16 for a substantial part of its length, the remaining part of its length being provided with a slotted opening 17, so as to receive the standard tapered shank body 18 and the drivable tang 19, respectively, of a tool such as tap 12. It is to be understood that while the preferred embodiment shows a tapered arrangement, it is obvious that the inner periphery of the tubular socket member 13 can be straight-sided, that is untapered, to receive a straight diameter shank tool. Furthermore, it is to be understood that the term shank encompasses shanks integral with the cutting portion of the tool, and adapter shanks and sleeves intended to be used with said tools.

A steel sleeve member 20, having an inwardly projecting flange portion 21 on one end thereof, surrounds and slidably engages the outer periphery of tubular socket member 13, the inwardly projecting flange 21 being interlockably related to the outwardly projecting flange 15 on tubular socket member 13.

Between the spaced flanges are inserted annular friction elements 22 and 23, made of fibre, Formica, or the like, that are separated from each other by a brass washer 24, and from flanges 15 and 21 by brass washers 25 and 26, respectively.

Annular adjusting nut 27 is threadedly engaged with threads 14 on inner tubular socket member 13. Brass washer 30 is interposed between said adjusting nut and said flange 21. Frictional adjustment of the tool holder assembly is made by loosening or tightening adjusting nut 27 to proper tension. A recess 28 is provided radially of said adjusting nut 27 for

the engagement therein of a spanner wrench for tightening or loosening said nut. Lock screw 29 secures the adjusting nut against displacement once the proper tension has been set.

Operation. Secure the assembled tool in the turret of a lathe (not shown) holding the sleeve 20 stationary therein. Insert the shank 18 of tap 12 into socket member 13 until the drivable tang 19 engages with the slotted opening 17.

Now set the friction so the tap will slip internally before the breaking point of the tap is reached. This is accomplished by tightening the adjusting nut 27 until a substantial twisting strain applied by a wrench is necessary to rotate the tap in the assembly.

Tightening of the adjusting nut 27 builds up the necessary friction in the tool holder assembly so as to hold socket 13 and its tap 12 stationary relative to sleeve 20. As the work revolves about the tap, the tap is caused to thread a hole in the work. When the bottom of the hole is reached, and ensuing increased torsional forces tend to damage or break the tap, the friction elements will yield their grasp and permit the socket and its associated tap to harmlessly rotate with the work.

It is an object of this invention to provide a tool holder of extreme compactness resulting from the telescopic arrangement of parts and the disposition of frictional elements around the shank of a tool held thereby.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practised otherwise than as specifically described.

What is claimed and desired to be protected by Letters Patent of the United States is:

1. A tool holder, comprising: an elongated socket member having an elongated tapered bore terminating in a tang receiving slot whereby to receive a tapered tool shank and its associated drivable tang, said socket being provided with threads on one end thereof and an outstanding flange on the tang receiving end; an elongated sleeve, adapted to be held in a turret, slidably mounted on said socket member, said sleeve having an inwardly projecting flange on the end remote from said outstanding flange interlockably related to said outstanding flange; a plurality of annular friction elements interposed between said flanges, said frictional elements being disposed to surround said shank; and an annular nut threadedly engaged with the threads on said socket and in abutting relation to said sleeve, operative to adjust the frictional engagement between said parts.

2. A tool holder, comprising: an elongated socket member having an elongated bore terminating in tang receiving means whereby to receive a tool shank and its associated tang, said socket being provided with threads on one end thereof and an outstanding flange on the tang receiving end; a sleeve, adapted to be held in

a turret, slidably mounted on said socket member, said sleeve having an inwardly projecting flange interlockably related in opposite directions to said outstanding flange; a plurality of annular friction elements interposed between said flanges, said frictional elements being disposed to surround said shank; and a nut threadedly engaged with the threads on said socket operative to adjust the frictional engagement between said parts.

3. A tool holder, comprising: a socket member having a bore terminating in tang receiving means whereby to receive a tool shank and its associated tang, said socket being provided with an outstanding flange on the tang receiving end; a sleeve, adapted to be held in a turret, slidably mounted on said socket member, said sleeve having an inwardly projecting flange interlockably related in opposite directions to said outstanding flange; annular friction means interposed between said flanges; and means on the mouth end of said socket, operative to adjust the frictional engagement between said parts.

4. A tool holder, comprising: a socket member adapted to receive the shank of a tool and having an outstanding flange; a sleeve slidably mounted on said socket member, said sleeve having an inwardly projecting flange interlockably related to said outstanding flange; a plurality of annular friction elements interposed between said flanges, said elements being disposed to surround said shank; and means associated with the mouth end of said socket and the flange end of said sleeve operative to adjust the frictional engagement between said parts.

5. A tool holder, comprising: a socket member adapted to receive the shank of a tool, and having an outstanding flange; a sleeve slidably mounted on said socket member, said sleeve having an inwardly projecting flange interlockably related to said outstanding flanges; annular friction means interposed between said flanges; and means operative to adjust the frictional engagement between said parts.

6. The device of claim 4 and washers interposed between the friction elements, between the outstanding flange and its adjacent friction element, and between the inwardly projecting flange and its adjacent friction element.

FRANK M. MARSHALL.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
692,642	Eisenhuth	Feb. 4, 1902
768,359	Eisenhuth	Aug. 23, 1904
1,873,173	Anderson	Aug. 23, 1932

FOREIGN PATENTS

Number	Country	Date
15,711	Australia	Dec. 24, 1934
66 110	Sweden	July 9, 1926