Aug. 26, 1952 K. O. FELLROTH 2,608,121

MULTIMICRO CUT BAR TURNER

Filed Aug. 19, 1948 3 Sheets-Sheet 1

Fig. 1

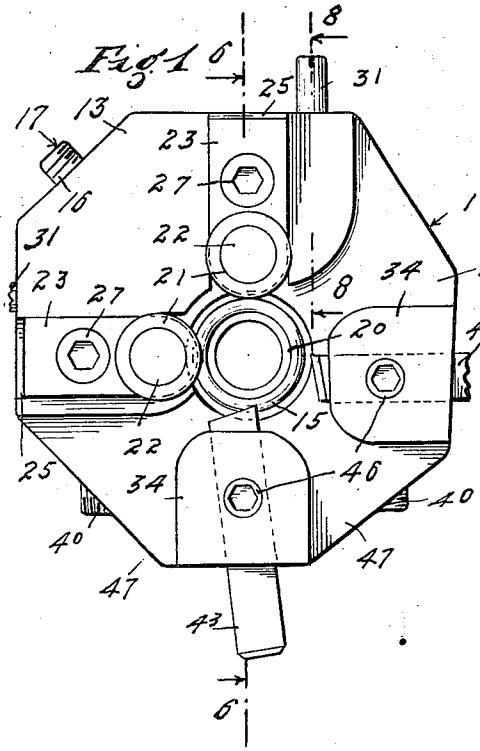


Fig. 2

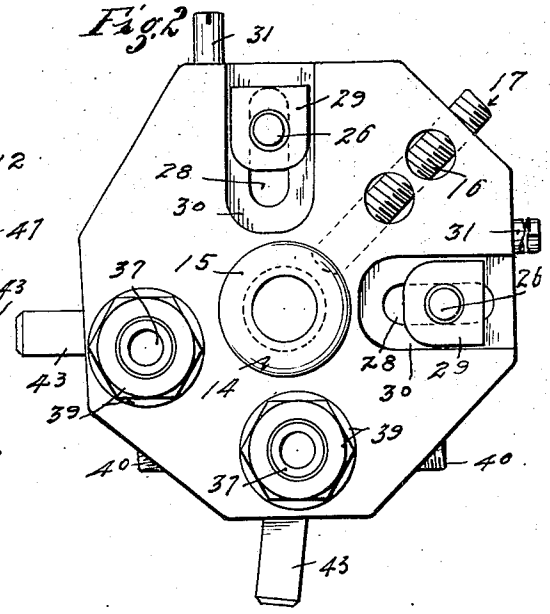
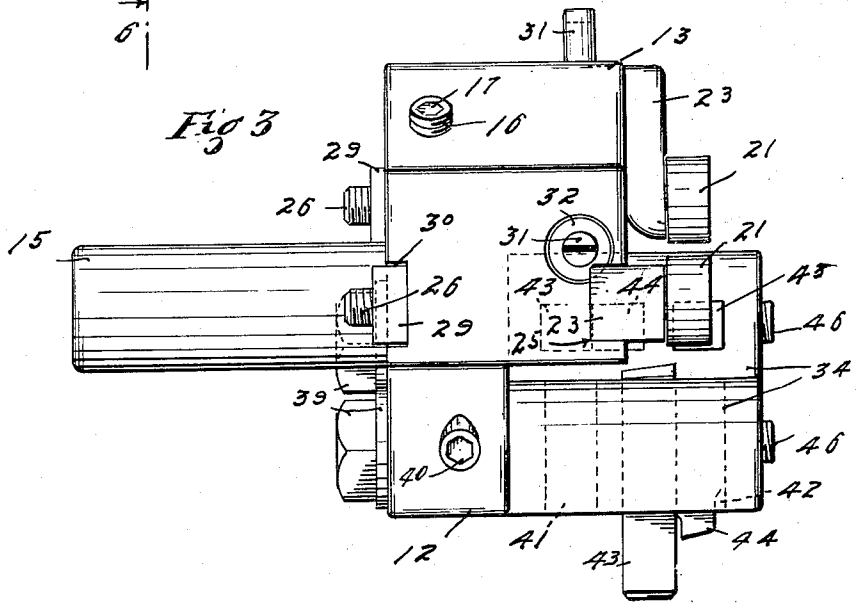


Fig. 3



INVENTOR.
Karl O. Fellroth
BY
Harry D. Kilgore
Attorney

Aug. 26, 1952 K. O. FELLROTH 2,608,121

MULTIMICRO CUT BAR TURNER

Filed Aug. 19, 1948 3 Sheets-Sheet 2

Fig. 4

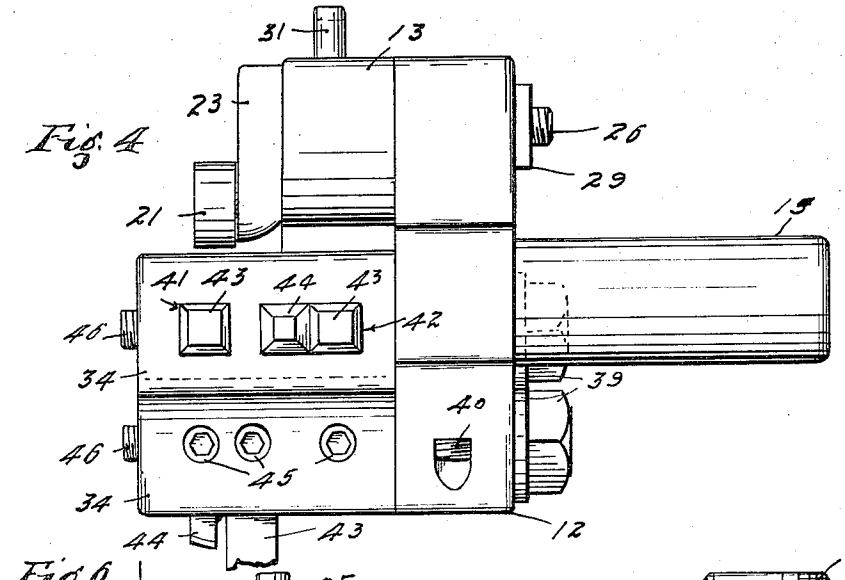


Fig. 6

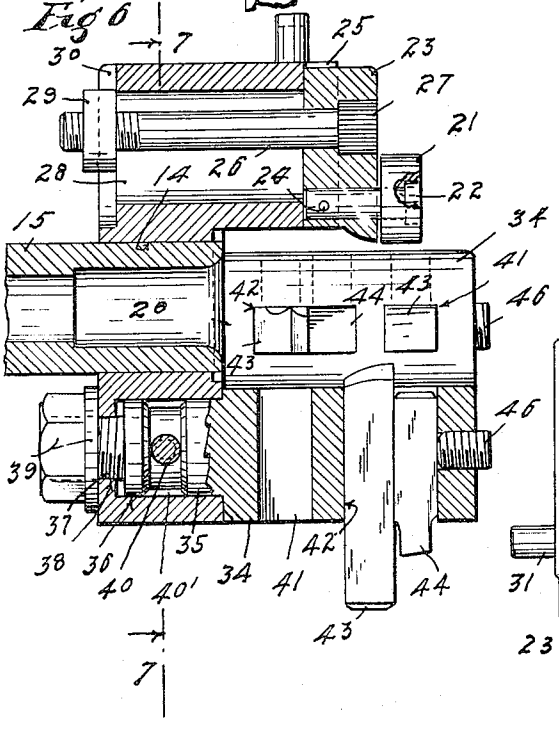
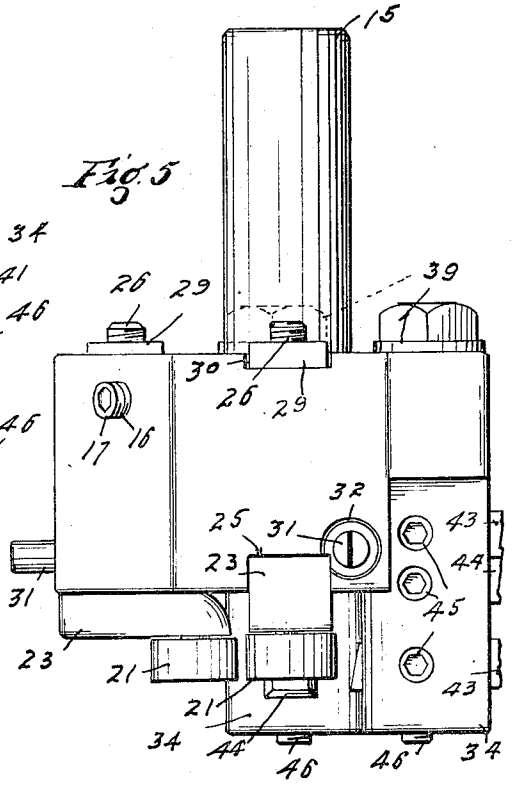


Fig. 5



INVENTOR.
Karl O. Fellroth
BY Harry D. Kilgore
Attorney

Aug. 26, 1952 K. O. FELLROTH 2,608,121

MULTIMICRO CUT BAR TURNER

Filed Aug. 19, 1948 3 Sheets-Sheet 3

Fig 7

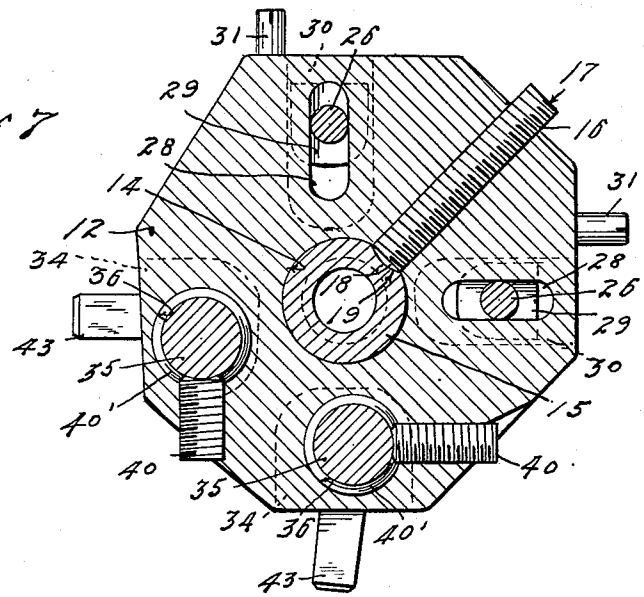


Fig. 8

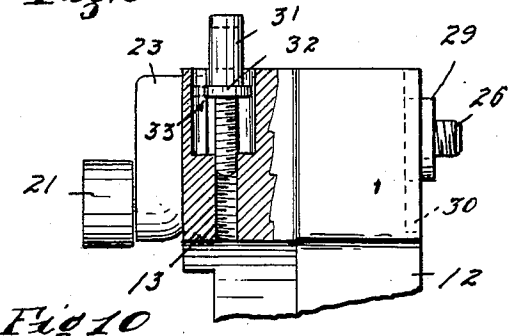


Fig. 9

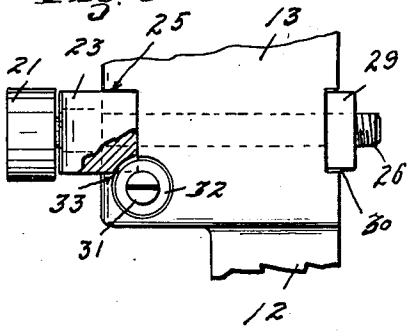


Fig 10

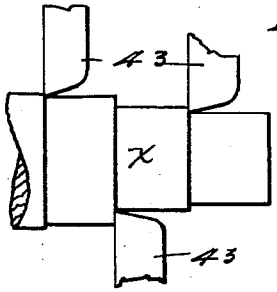
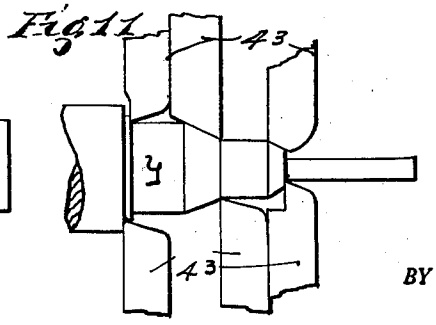


Fig 11



INVENTOR.
Karl O. Fellroth
BY Harry D. Kilgore
Attorney

Patented Aug. 26, 1952 2,608,121

UNITED STATES PATENT OFFICE

2,608,121

MULTIMICRO CUT BAR TURNER

Karl O. Fellroth, Minneapolis, Minn.

Application August 19, 1948, Serial No. 45,141

3 Claims. (Cl. 82—35)

1

My present invention relates to improvements in bar turning tools, commonly called box tools, and, more particularly, to a multimicro cut bar turner.

It is well known that in setting up a machine, such as a screw machine, a turret lathe and the like, for a complex job, such as turning a plurality of small or short length cuts, it has been necessary to load such a machine with a whole series of tool holders and do each cut separately or else grind special form tool cutters in order to cope with the job.

The principal object of this invention is to provide a single tool which will do, simultaneously, all of these operations by a plurality of cuts, thus saving production time, eliminating variables that result in inaccuracies, and being easy to tool up, set up and adjust by a novel arrangement of tool bits, tool bit holders and work-holding pressure rollers, that allow a wide range of all around versatility for different kinds of bar turning.

Another object of this invention is to provide a bar turning tool which is very compact, sturdy and easy to adjust, with all parts exposed for inspection and adjustment and allowing set-up where there will be no breaking of tool bits by striking parts of the machine to which the bar turner is attached.

Other objects of this invention will be apparent from the following description, reference being had to the drawings.

To the above end, generally stated, the invention consists of devices and combination of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Figs. 1 and 2 are front and rear elevational views, respectively, of the improved tool;

Figs. 3 and 4 are left and right-handed elevational views, respectively;

Fig. 5 is a plan view of the improved tool;

Fig. 6 is a view partly in elevation and partly in section taken on the line 6—6 of Fig. 1;

Fig. 7 is a view principally in transverse section taken on the line 7—7 of Fig. 6;

Fig. 8 is a fragmentary detail view partly in elevation and partly in section taken on the line 8—8 of Fig. 1;

Fig. 9 is a view principally in plan of the parts shown in Fig. 8;

Fig. 10 is a fragmentary view in diagram

2

showing a tool bit set-up as shown in the drawings of the tool; and

Fig. 11 is a fragmentary view in diagram showing a more complex tool bit set-up than that shown in Fig. 10.

The numeral 12 indicates an upright body member formed of a single block of metal that is substantially octagonal in cross-section. Integral with the upper left-hand portion of the body member 12 is a forwardly projecting extension 13. Extending centrally through the body member 12, from front to rear, is a bore 14 in which is removably mounted the inner end portion of a tubular shank 15 for attaching the tool to a turning machine. A long set screw 16 having threaded engagement with the body member 12, is provided for holding the shank 15 in the bore 14. This set screw 16 has a socket head 17 and its rounded inner end 18 extends into a seat 19 in the periphery of the shank 15 and rigidly holds said set-screw relative to the body member 12. The internal diameter of the shank 15, at its inner end portion, is materially enlarged to afford a work passageway 20.

Two work-engaging pressure rollers 21 are journaled each on a headed stud 22, the axis of which is parallel to the projected axis of the shank 15. The heads of the studs 22 are countersunk in the rollers 21 and their outer ends are flush with the faces of said rollers. Each stud 22 is mounted in a transverse bore in the rectangular carrier 23 and is secured thereto by a pin 24. The roller carries 23 are each mounted to slide in a way 25 in the form of a channel in the body member extension 13. The ways 25 extend radially from the projected axis of the shank 15 ninety degrees (90°) apart, and one thereof is vertically disposed above the projected axis of said shank and the other thereof is horizontally disposed relative to said axis and at the left thereof.

The roller carriers 23 are rigidly held where adjusted in the ways 25, by long bolts 26 having enlarged socket heads 27 that are countersunk in the carriers 23. Each bolt 26 extends through a slot 28 in the body member 12 and its extension 13. A nut 29 is applied to the threaded outer end portion of each bolt 26 and extends into a channel 30 in the back of the body member 12. Two sides of the nut 29 are flat, parallel and engage the sides of the channel 30 and are thereby held from turning.

Each roller carrier 23 is positively adjusted in its way 25 to position its roller 21 on a piece of work by a long screw 31 having threaded en-

gagement with the body member 12. An annular collar 32 on each adjusting screw 31 extends into a transverse notch 33 in the adjacent roller carrier 23 and couples said carrier to the respective adjusting screw 31.

A pair of long tool bit holders 34 are detachably and adjustably secured to the body member 12 and project forwardly therefrom parallel to the projected axis of the shank 15. These tool bit holders 34 are diametrically opposite the pressure rollers 21 and each thereof has on its rear end a cylindrical member 35 turnably mounted in a bore 36 that extends into the body member 12 from the face thereof and parallel to the axis of the shank 15. The cross-sectional area of the cylindrical member 35 is materially less than that of the respective tool holder 34 so that said tool holder, at its inner end, impinges the face of the body member 12 as a base of resistance. On the rear end of the cylindrical member 35 is a screw stud 37 of reduced diameter that extends through a bore 38 in the back of the body member 12. A washer and a nut 39 are applied to the outer end portion of the stud 37 and it is important to note that said stud has a left-hand screw thread. By tightening the nut 39 on the stud 37, the tool holder 34 is drawn tightly against the face of the body member 12 and thereby holds the tool holder from turning during operation of the tool.

After the tool holders 34 have been positioned to align the tool bits 43 with a piece of work, and before the nut 39 is tightened on the screw stud 37, the same are positively held by a set screw 40 having threaded engagement with the body member 12. This set screw 40 has a socket head and its inner end portion extends into an annular channel 40' in the cylindrical member 35 and impinges said member. The purpose of the set screw 40 is to positively hold the tool holder 34 from being moved out of adjustment while the nut 39 is being tightened on the screw stud 37. Furthermore, the set screw 40 supplements the nut 39 in holding the tool holder 34 from turning relative to the body member 12. The set screw 40 will also take up any slight lateral play the cylindrical member 35 may have in the bore 36. The left-hand thread on the screw stud 37 tends to tighten the nut 39 thereon when the tool bit holder 34 is subjected to a force by the tool bits when making a cut that tends to turn the same.

Formed in each tool bit holder 34 is, as shown, a single tool bit seat 41 and a double tool bit seat 42, the latter for holding a single tool bit and a spacer or two tool bits. The tool bit seats 41 and 42 are rectangular in cross-section and extend completely transversely through the tool bit holders 34. All tool bits shown are designated by the numeral 43 and the spacers are designated by the numeral 44. In the drawings, the tool bit seats 41 and 42 in the two tool bit holders 34 are reversely arranged, see Fig. 6. The tool bits 43 and the spacers 44 are individually held where adjusted in the seats 41 and 42 by set screws 45, having socket heads, and their inner ends impinge said tool bits and spacers. These set screws 45 extend transversely of the tool bit holders 34. In addition to the set screws 45, the tool bits 43 or the tool bits 43 and spacers 44 in the outer seats 41 and 42 are further held by set screws 46 that have threaded engagement with the tool bit holders 34 and extend into the outer ends thereof.

In Fig. 10 is shown a piece of work x turned by the tool bit 43 as positioned in the drawings, and Fig. 11 shows a more complex piece of work y from that shown in Fig. 10 by the use of additional tool bits.

From the above description, it is evident that the tool bit holders 34 may be adjusted about their axes to position the tool bits 43 relative to a piece of work. In case of a simple turning job, one of the tool holders 34 may be removed.

Mounting the tool holders 34 so that they project forwardly from the face of the body member 12, positions the tool bits 43 so that they may be easily adjusted and the operation thereof watched. The arrangement of the pressure rollers 21 and the tool bit holders 34 is such as to leave ample chip escape and sight passageways 47 therebetween.

The drawings illustrate a commercial form of the invention, but it will be understood that the same is capable of modifications as to details of construction and arrangement within the scope of the invention herein described and defined in the claims.

What I claim is:

1. In a tool, a body member having a work passageway, a tool bit holder extending outwardly of the body member with its inner end abutting the face of the body member, said tool holder having on its inner end a cylindrical extension mounted in the body member to turn about an axis parallel to the axis of the work passageway, a screw stud on the outer end of the cylindrical extension and extending outwardly of the body member, a nut on the screw stud, impinging the body member and holding the tool holder with its inner end clamped against the face of the body member, a set screw impinging the cylindrical extension and holding the same from turning about its axis, said tool holder having a transverse seat for a tool bit that intersects the axis thereof, said seat being arranged to hold a tool bit with its cutting edge substantially on a radial line extending from the axis of the work passageway, turning movement of the tool holder about the axis of its cylindrical extension moving the cutting edge of the tool bit on the arc of a circle that intersects said radial line.

2. In a tool, a body member having a work passageway, a tool holder extending outwardly of the face of the body member and having on its inner end a cylindrical extension turnably mounted in a seat in the body member, said tool holder and its shank having the same longitudinal axis that is parallel to the axis of the work passageway, said tool holder having a transverse tool bit seat that intersects said longitudinal axis, a tool bit mounted in the last noted seat for endwise adjustment, releasable means holding the tool bit in its seat against endwise movement, and means for locking the tool holder extension in its seat, turning movement of the tool holder extension in its seat swinging the tool bit about said longitudinal axis.

3. In a tool, a body member having a work passageway, a tool holder extending outwardly of the face of the body member and having on its inner end a cylindrical extension turnably mounted in a seat in the body member, said tool holder and its extension having the same longitudinal axis that is parallel to the axis of the work passageway, means for drawing said extension endwise in its seat to clamp the tool holder at its inner end against the face of the tool holder, releasable means holding said extension from turning in its seat, said tool holder having a transverse tool bit seat that intersects said

longitudinal axis, a tool bit mounted in the last noted seat for endwise adjustment, releasable means holding the tool bit in its seat against endwise movement, and means for locking the tool bit in its seat, turning movement of the tool holder extension in its seat swinging the tool bit about said longitudinal axis.

KARL O. FELLROTH.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
805,539	Gylfe	Nov. 28, 1905
1,228,570	Kupp	June 5, 1917
2,389,853	Harris	Nov. 27, 1945
2,404,859	Melling	July 30, 1946
2,473,418	Fellroth	June 14, 1949

FOREIGN PATENTS

Number	Country	Date
2,438	Great Britain	Sept. 20, 1906