O. GUSTAFSON.

TOOL HOLDER.

APPLICATION FILED MAY 12, 1920.

1,380,317.

Patented May 31, 1921.

4 SHEETS—SHEET 1.

FIG 1

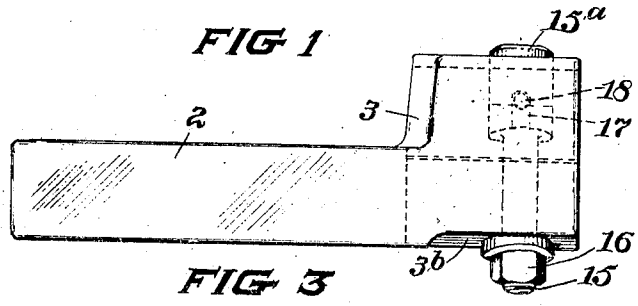


FIG 2

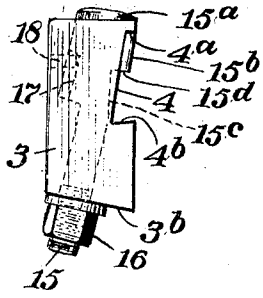


FIG 3

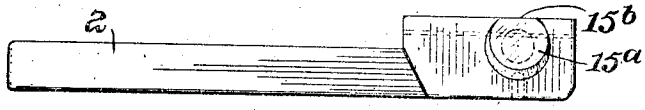


FIG 5

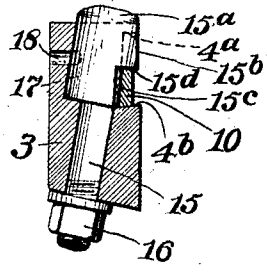


FIG 4

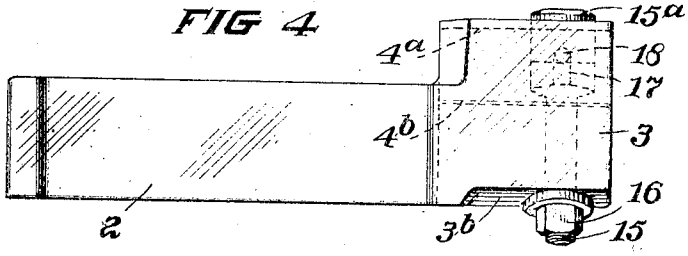


FIG 6

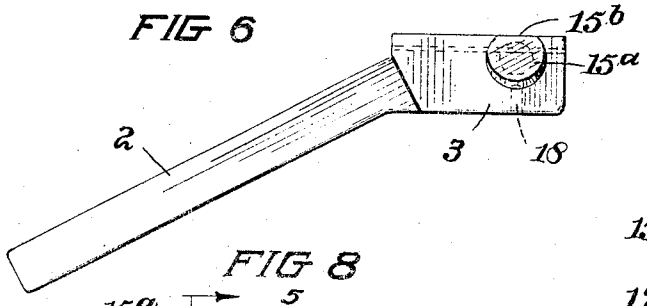


FIG 7

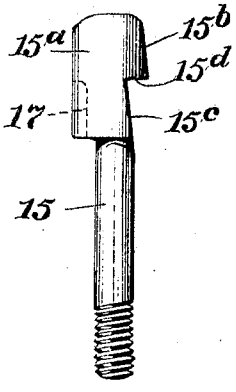
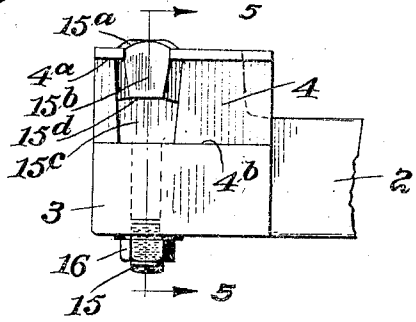


FIG 8



Oscar Gustafson
INVENTOR

Eugene C. Brown
Atty.

O. GUSTAFSON.

TOOL HOLDER.

APPLICATION FILED MAY 12, 1920.

1,380,317.

Patented May 31, 1921.

4 SHEETS—SHEET 2.

Fig. 9.

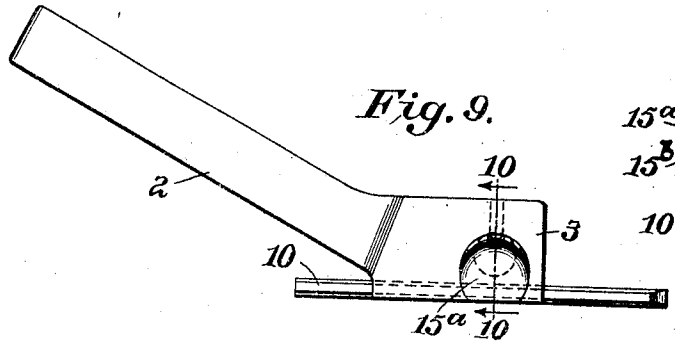


Fig. 10.

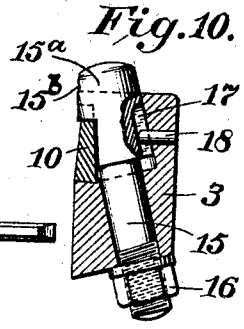


Fig. 11.

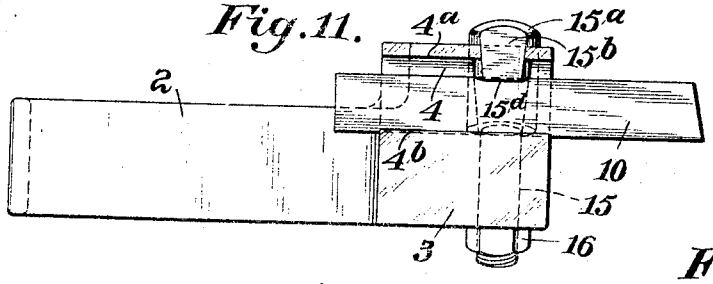


Fig. 12.

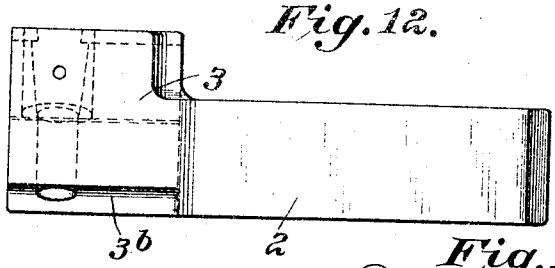


Fig. 13.

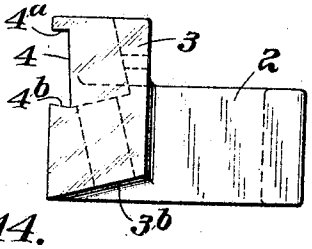
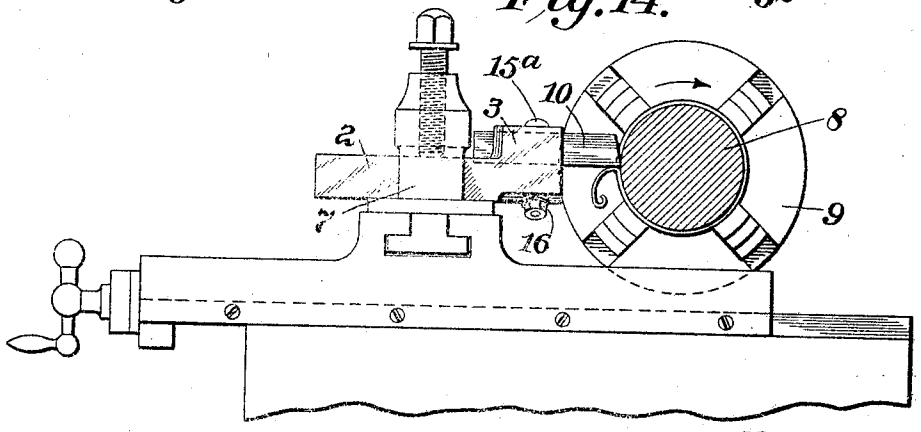


Fig. 14.



Inventor:

Oscar Gustafson,

by Eugene C. Brown

Atty.

O. GUSTAFSON.

TOOL HOLDER.

APPLICATION FILED MAY 12, 1920.

1,380,317.

Patented May 31, 1921.

4 SHEETS—SHEET 3.

Fig. 15.

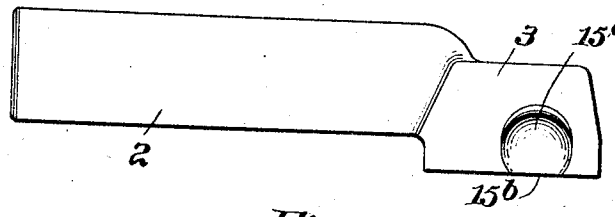


Fig. 16.

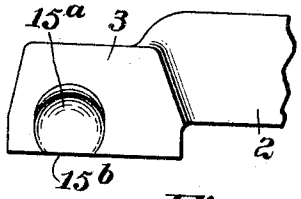


Fig. 17.

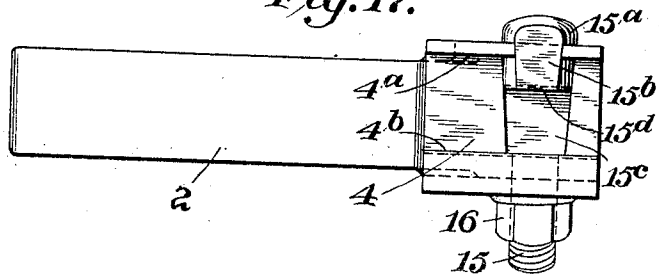


Fig. 18.

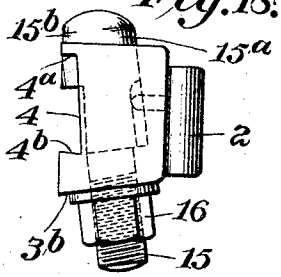


Fig. 19.

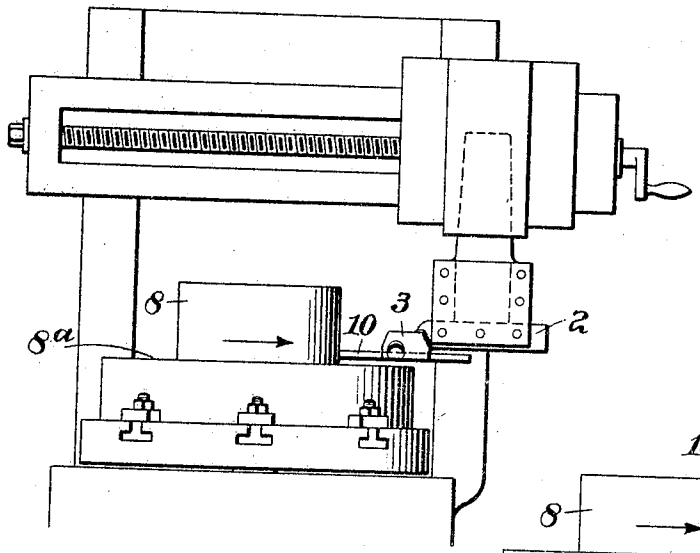
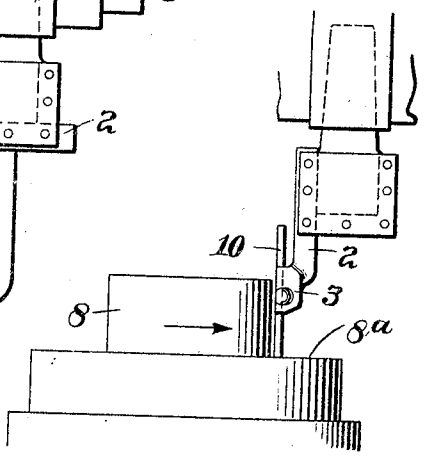


Fig. 20.



Inventor:

Oscar Gustafson,

by Eugene C. Brown

Atty.

O. GUSTAFSON.

TOOL HOLDER.

APPLICATION FILED MAY 12, 1920.

1,380,317. Patented May 31, 1921.

4 SHEETS—SHEET 4.

Fig. 21.

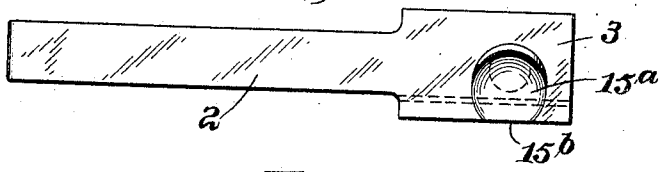


Fig. 23.

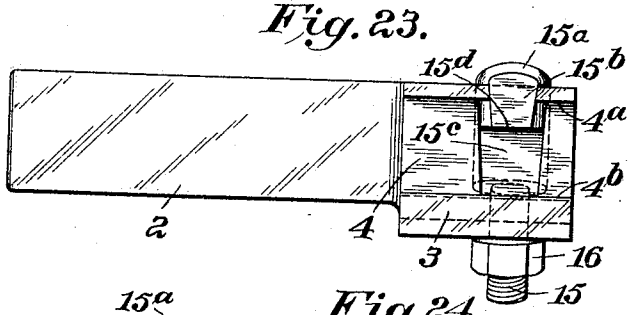


Fig. 22.

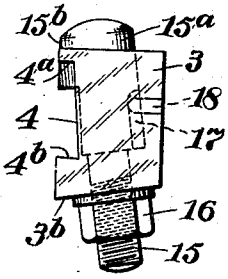


Fig. 24.

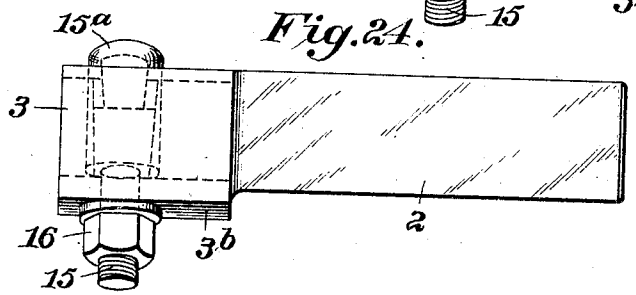
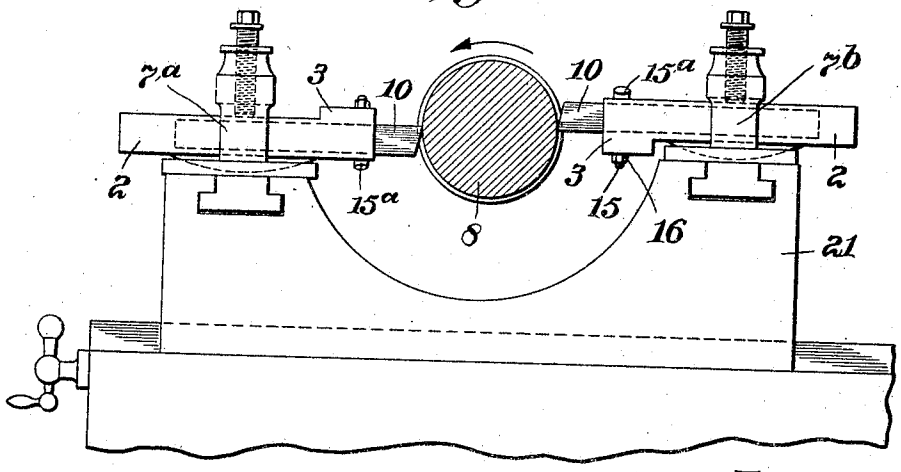


Fig. 25.



Inventor:

Oscar Gustafson,

by Eugene C. Brown

Atty.

UNITED STATES PATENT OFFICE.

OSCAR GUSTAFSON, OF SEATTLE, WASHINGTON.

TOOL-HOLDER.

1,380,317. Specification of Letters Patent. **Patented May 31, 1921.**

Application filed May 12, 1920. Serial No. 380,837.

To all whom it may concern:

Be it known that I, OSCAR GUSTAFSON, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Tool-Holders, of which the following is a specification.

My invention relates to that class of tool holders employed in lathes, planers, screw machines, boring machines, etc.

One object of my invention is to provide a holder which will firmly grip the cutter blade and hold it in the proper position and is adapted to receive blades of different sizes. A further object is to provide a holder which will hold the tool in its natural position with relation to the work so that it will cut evenly without biting into the work or chattering, thus avoiding the danger of breaking the cutter or of spoiling the work.

In the following description, I shall refer to the accompanying drawings in which—Figures 1, 2 and 3 are side elevation, end elevation, and top plan views respectively of a straight tool holder embodying my invention; Figs. 4 and 6 are side elevation and top plan views respectively of a left-hand tool holder; Fig. 5 is a vertical sectional view on the line 5—5 of Fig. 8; Fig. 7 is a longitudinal plan view of the clamping bolt; Fig. 8 is a fragmentary side elevation of the clamping end of the tool upon the side opposite that shown in Fig. 1; Fig. 9 is a top plan view of a right hand holder; Fig. 10 is a vertical sectional view on the line 10—10 of Fig. 9; Figs. 11 and 12 are side elevations of the same taken from opposite sides; Fig. 13 is an end elevation of the same; Fig. 14 is a fragmentary conventional view, partly in section of a lathe showing my tool holder with a cutting tool in operative position, the lathe shaft rotating in opposite direction from the usual; Figs. 15 and 16 are top plan views respectively, of the tool holders adapted for boring-mill machines rotating in the usual direction; Figs. 17 and 18 are side and end elevations of the holder shown in Fig. 15; Figs. 19 and 20 are fragmentary conventional side elevations of a vertical spindle boring mill machine showing my tool holder in operative position; Figs. 21 and 22 are top plan and end elevation of a tool holder which enables the cutting tool to fit snugly against the side of the tool shank, so that the holder and tool may be received by the opening in the tool rest; Figs. 23 and 24 are side elevations taken from opposite sides of the same; and Fig. 25 is a fragmentary conventional end elevation of a turret lathe and screw machine showing my tool holders in the front and rear tool posts.

The tool holder embodying my invention comprises an elongated shank portion 2 and an integral thickened head portion 3 to which the cutting tool is secured. In the forms shown on Sheets 1 and 2 of the drawings, the head is provided with an offset portion so that the tool holding groove 4 may be mainly at one side of the shank. The purpose of this is to enable the cutting edge of the cutter to be placed on the diameter of the work with the tool and the shank upon opposite sides thereof. This is illustrated in Fig. 14 which shows the shank 2 clamped in the tool post 7 below the horizontal diameter of the work 8 which is clamped in the lathe stack 9, while the cutting tool 10 is located above the horizontal diameter of the work. The advantage of this arrangement will be appreciated by machinists and those who have had experience in lathe work. The cutting edge of the tool bears directly upon the horizontal diameter of the work so that there is no tendency of the tool to bite into the work and this arrangement also obviates any tendency of the tool to chatter. I am therefore able to obtain a smooth, even cut and without danger of breaking the tool or of injuring the work on the chuck.

The blade tapers from the cutting edge to the rear edge. The lower flange 4^b of the notch in the head upon which the cutting side of the tool bears is supported by a heavy block of metal while the upper marginal flange 4^a of the notch may be quite shallow as no strain is brought thereon.

The tool is clamped between the head of a clamping bolt 15 and the flange 4^b of the head portion of the holder. The hole through the head 3 is bored through the head obliquely extending from the upper tool face rearwardly and downwardly through the head and passing through the lower side of the holder adjacent the rear edge. The lower side of the head 3^b is beveled rearwardly so that it is perpendicular to the axis of the bolt. In order that the bolt may overhang the tool in the plane thereof, the bolt hole extends through the front wall at the upper flange 4^a and the enlarged head 15^a is beveled or flattened at 15^b so that it will lie in the plane of the tool face of the holder. The

bore of the bolt hole is enlarged at the upper end to conform to the size of the head of the bolt while the lower portion of the bore conforms to the size of the shank of the bolt. This is the advantage of leaving as much metal as possible in the main body of the head which receives the thrust and strains of the cutter.

The notch 15^c which is cut into the inner end of the enlarged head of the bolt slants inwardly from the base at such an angle that the face of the notch will be substantially parallel with the axis of the tool holder head when the bolt is in position. The incline of the bolt causes the upper edge of the notch 15^d to slant slightly downwardly over the tool thereby forcing the tool rearwardly against the side face of the notch as the bolt is tightened by means of the nut 16 so that the cutter is securely held in a vise-like grip between the head of the bolt and the flange 4^b of the holder. In order to prevent any tendency to axial movement of the bolt, a notch 17 is cut in the rear side of the bolt head and receives a pin 18 secured in the head.

The advantage of the clamping device above described will now be appreciated by engineers and machinists. It will be evident that the thrusts and strains transmitted through the cutter are received by the clamping bolt in a direction longitudinal of its axis so that there is no shearing strain produced upon the bolt and the grip upon the tool may be made as tight as desired. By reason of the oblique position of the bolt the tool is drawn tightly in a lateral direction against the bolt by the same action which draws it downwardly against the flange 4^b of the head. It will also be observed that by reason of the inclined position of the bolt, there is a small component of the thrust from the cutter blade which is transverse to the bolt head and this has a tendency to maintain the cutter blade tight against the side face of the notch in the bolt. All of these forces, therefore, act in a direction to maintain the blade firmly in the head without any tendency to move away from the side face of the notch 4 against which the blade is drawn when the bolt is tightened.

In Sheets 3 and 4 of the drawings I have shown a form of holder in which the face of the head which carries the cutting tool is substantially in alinement with the shank but is offset laterally a distance sufficient to permit the rear end of the cutter blade to extend alongside of the shank. This makes a very compact construction which is especially adapted for use with boring mill machines, as illustrated conventionally in Figs. 19 and 20. It is also adapted for universal turret lathes and screw machines. By offsetting the head laterally the tool can operate up to a face or offset of the work. Thus in Fig. 19 the cutter is operating along the vertical face of the work which is being rotated on a vertical axis in the machine and the tool can operate down to the horizontal offset or face 8^a of the work; and in Fig. 20 the tool operating back and forth across the horizontal face 8^a of the work, can operate close to the vertical face of the work. The advantage of this offset construction of the holder head will be appreciated by machinists.

In Fig. 25 I have shown cutters operating upon opposite sides of the work, both cutting upon the horizontal diameter thereof, the tool and holder in the rear post 7^b being reversed in position from that in the front post 7^a, these posts being supported in a compound rest 21.

In the accompanying drawings I have illustrated a number of different forms of my holder for the purpose of clearly disclosing embodiments of my invention, but it will be evident to engineers that various other forms and modifications may be made without departing in any manner from the invention. My clamping device is not only as simple in construction as is possible, but requires no auxiliary members. Cutting blades of different sizes may be employed and each will be held with the same firm vise-like grip between the shoulder 15^d of the bolt and the flange 4^b of the head and will be drawn firmly against the rear face of the slot 4 by reason of the inclination of the bolt in the head. As previously pointed out, when the bolt is tightened by means of the nut 16 pressure is simultaneously brought upon the cutting blade to press it firmly against the ledge or flange 4^b and to move it laterally against the rear face of the notch 4 in the head. At the same time the blade is properly positioned in the holder for the cutting operation.

Having now described my invention what I claim as new and desire to protect by Letters Patent is:—

1. A tool holder for the cutters of lathes, boring mill machines, planers, etc., comprising integral shank and head portions, the latter being provided with a groove in its side face extending longitudinally thereof for the reception of a cutter, a bolt extending through a passage in said head and projecting through the face thereof at the top of said groove and extending rearwardly and downwardly oblique to the sides of the head, a notch in the head of the bolt providing an overhanging flange to engage one edge of the cutter and clamp it against the opposite ledge of said groove.

2. A tool holder for the cutters of lathes, boring mill machines, planers, etc., comprising integral shank and head portions, the latter being provided with a groove in

its side face extending longitudinally thereof for the reception of a cutter, a bolt extending through the head from top to bottom thereof oblique to the plane of said groove, said bolt having a notch to receive one edge of the cutter and clamping the opposite edge against the opposite ledge of the groove.

3. A tool holder for the cutters of lathes, boring mill machines, planers, etc., comprising an integral shank and clamping head, the latter being provided with a laterally extending ledge, a bolt extending obliquely through the head and provided with a flange or offset which overhangs said ledge, whereby a cutter may be clamped between said flange and said ledge by tightening a nut on the projecting lower end of said bolt and by reason of the obliquity of the bolt the cutter will be drawn inwardly against the side face of the head.

In testimony whereof I affix my signature.

OSCAR GUSTAFSON.