

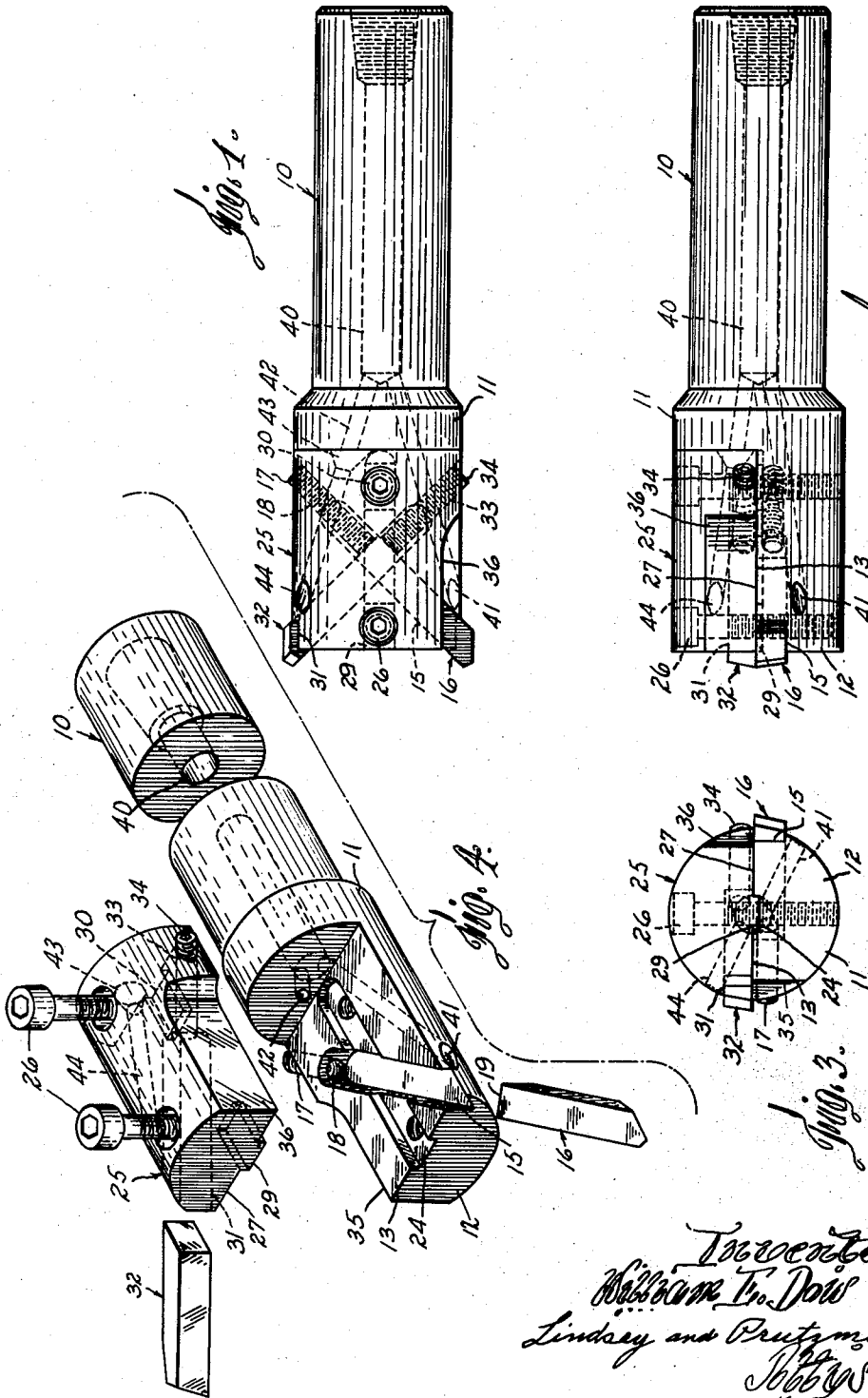
Aug. 12, 1958

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2,846,904

BORING BAR

Filed Feb. 1, 1956



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1

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**BORING BAR**

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Application February 1, 1956, Serial No. 562,759

5 Claims. (Cl. 77—58)

This invention relates to metal cutting tools, and more particularly to a boring bar of novel and improved construction.

It is a general aim of this invention to provide a simple and inexpensive boring bar for use with high speed multi-spindle machines which will provide improved support for the cutting tools used therewith as well as a performance and service life superior to that presently obtainable with existing tools of this type.

It is a more specific aim of this invention to provide a boring bar for the use described which will utilize standard size tool bits as the cutting edges of the tool and which will incorporate a novel and improved means for retaining and supporting the bits in the boring bar.

Other objects will be in part obvious, and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application of which will be indicated in the appended claims.

In the drawings:

Fig. 1 is a side elevational view of a boring bar embodying the present invention;

Fig. 2 is a side elevational view of the bar of Fig. 1 with the bar rotated 90° about its longitudinal axis;

Fig. 3 is an end view of the bar of Fig. 2; and

Fig. 4 is an exploded perspective view of the bar of Fig. 2.

With reference to the drawings, and particularly Fig. 4, a boring bar constructed in accordance with this invention is comprised of an elongated cylindrical shank 10 having an enlarged portion 11 preferably in the form of a cylinder from which a semi-cylindrical portion has been removed to form an axially extending semi-cylindrical tool holder base member 12 having an axially extending and diametrically disposed flat surface 13. The base 12 is further provided with a channel or U-shaped tool bit guideway 15 disposed along the flat surface 13 and preferably of a size corresponding to a suitable tool bit 16 of readily available stock size. A setscrew 17 is received in a threaded aperture 18 extending longitudinally of and communicating with the guideway 15 and is thus engageable with the end 19 of the tool bit 16 when the tool bit is received in the guideway. The setscrew 17 may be adjusted longitudinally of the guideway 15 to vary the position of the tool bit longitudinally of the guideway and thus vary the distance the cutting edge of the tool bit 16 extends radially beyond the periphery of the base 12 and further serves to support the tool bit against the endwise force imposed thereon during a boring operation.

In accordance with the invention, a cap member 25 of generally semi-circular cross section is mounted on the base 12 and secured thereto by means such as the screws 26 extending through the cap 25 and threadably received in the base 12. The cap 25 is provided with a diamet-

2

rical flat surface 27 which engages a side of the tool bit 16 and also the flat surface 13 of the base 12 when the cap and base are assembled to retain the tool bit 16 within the guideway 15 of the base portion. A pair of keys 29 and 30 preferably formed integrally with the cap portion 25 extend axially thereof and are receivable within a keyway 24 disposed axially of the base 12 along the flat surface thereof to laterally align the cap 25 with the base.

The cap 25 is further provided with a tool bit guideway 31 disposed along its flat surface 27 and extending in an opposite lateral direction relative to the guideway 15 of the base portion. The guideway 31, like the guideway 15, is preferably dimensioned to receive a tool bit 32 of a suitable stock size, and the cap 25 is further provided with a threaded aperture 33 in which is received a setscrew 34 for adjustably positioning and supporting the tool bit 32 in the same manner as the setscrew 17 supports and positions the tool bit 16. The tool bit 32 is retained in the guideway 31 by the engagement of a side thereof with the flat surface 13 of the base portion 12 when the base and cap are assembled.

As can be seen in the drawings and particularly in Fig. 4, the base 12 and cap 25 are provided with recesses 35 and 36, respectively extending axially thereof for the removal of chips cut by the tool bits 32 and 16, respectively.

The shank 10 is provided with a coaxially disposed fluid passageway 40 extending substantially the full length of the shank. A branch fluid passageway 41 communicates at one end with the passageway 40 and is inclined radially outwardly and axially therefrom to the periphery of the base portion 12 adjacent the open end of the guideway 15. A branch passage 42 in the head 11 communicates at one end with the passageway 40 and extends radially outwardly and axially of the head portion 11 for registry with a funnel-shaped entrance 43 of a passage 44 in the cap 25; the passage 44 extending outwardly of the cap to the periphery thereof adjacent the open end of the guideway 31. As should be apparent, the passageway 40 and branch passages 41, 42 and 44 are provided to carry cutting lubricant to the cutting edges of the tool bits 16 and 32.

As can be seen from the drawings taken in connection with the above description, when the tool bits 16 and 32 are disposed within the guideways 15 and 31, respectively, and the base 12 and cap 25 are assembled, the inward threading of the screws 26 will serve to securely clamp the tool bits 16 and 32 between the base portion and cap portion to securely retain them within their respective guideways, whereby the tool bits will be supported against movement axially and transversely of the shank 10. The setscrews 17 and 34 provide a firm endwise support of the tool bits against the axial thrust imposed thereon during use, and as heretofore mentioned, the setscrews also provide a means to adjust the extension of the cutting end of the tool bits beyond the periphery of the base portion 12 and cap 25, thus providing a means for accurately setting the tool to the desired cutting diameter.

A particular advantage of a boring bar incorporating the novel and improved means for tool bit retention and adjustment of this invention is that even after repeated regrinding of a tool bit, the bar will still accurately and securely support the bit with its cutting edge at the required cutting radius though the length of the bit has been substantially reduced as a result of the regrinding thereof. The fact that the bar is constructed for use with a tool bit of stock size rather than of custom design coupled with the ability of the bar to properly support the bit even after repeated regrindings thereof will, of

course, contribute to a substantial saving in tool cost in a long production run. Further, the boring bar is rugged yet simple and economical to manufacture and is of a construction which is particularly adaptable to the manufacture of boring bars of both large and small diameter.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim:

1. In a boring bar, an elongated shank, a toolholder base member fixed to and extending axially from the shank and having a flat surface extending longitudinally of the longitudinal axis of the shank, a cap member detachably mounted on the base member and having a flat surface generally coextensive with the flat surface of the base member and in engagement therewith, one of said members being provided with a channel-shaped tool bit guideway extending outwardly thereof and communicating with the flat surface of the other of said members, a tool bit having one end portion contained within said guideway and clampingly engaged between said guideway and said flat surface of said other member, means to align the longitudinal axis of said cap member with the longitudinal axis of the shank, and screw means threadably received in said one member in longitudinal alignment with and extendable into said guideway into engagement with the inner end of said tool bit.

2. In a boring bar of the type having an elongated cylindrical shank and means forming a coaxially extending fluid passageway in the shank the combination of a toolholder base member rigid with and extending axially of the shank, the base member being provided with a flat surface extending longitudinally of the longitudinal axis of the shank, a cap member mounted on the base member and having a flat surface generally coextensive with the flat surface of the base member and engaged therewith, the base member being provided with a U-shaped tool bit guideway disposed along the flat surface thereof in communication with the flat surface of the cap member, a tool bit having one end portion contained within said guideway and engaged between said guideway and the flat surface of the cap member, a groove in one of said members disposed along the flat surface thereof, and extending in a direction axially of the shank on both sides of said guideway, a pair of key members integral with the other member and receivable in said groove on opposite sides respectively of the guideway to maintain said members in lateral alignment, and a setscrew threadably received in the base member in longitudinal alignment with the guideway thereon and extendable longitudinally into said guideway.

3. In a boring bar, an elongated cylindrical shank, a tool holder base member rigid with one end and extending axially of the shank, the base member being provided with an axially extending flat surface disposed diametrically of the shank and forming a shoulder extending radially outwardly of the shank and facing in the direction of said flat surface, a cap member detachably mounted in the base member in engagement with said radially extending shoulder and having a flat surface generally coextensive with and engaged with the flat surface

of the base member, the base member being provided with a tool bit guideway having a U-shaped cross section and being disposed along the flat surface thereof in communication with the flat surface of the cap member, a tool bit having one end portion contained within said guideway and clampingly engaged between said guideway and the flat surface of said cap member, and a setscrew threadably received in the base member in longitudinal alignment with the guideway therein and extendable longitudinally into said guideway.

4. In a boring bar a cylindrical shank portion, a toolholder base member rigid with and extending axially outwardly of the shank and having a flat surface disposed along the longitudinal axis of the shank and extending diametrically of the shank, means forming a shoulder on the base member extending from the inner end of said flat surface radially outwardly of the shank and facing axially of the shank in the direction of said flat surface, a cap member having a pair of flat surfaces respectively engageable with the flat surface and shoulder of the base member, a pair of intersecting tool bit guideways disposed along the flat surface of the base member and cap member respectively and extending in opposite lateral directions relative to the shank, a pair of tool bits, each having one end portion respectively contained within one of said guideways, means spaced from said guideways on opposite sides thereof and engageable with both said members to clamp a pair of tool bits respectively received in said guideways between said guideways and the flat surfaces of said members for longitudinal and lateral support relative to the longitudinal axis of the shank, and screw means threadably received in each of said members in longitudinal alignment with its respective guideway and extendable thereinto for endwise supporting engagement with a tool bit.

5. In a boring bar a cylindrical shank, a semi-cylindrical toolholder base member coaxially extending from the shank, a semi-cylindrical cap member detachably mounted on the base member and extending coaxially of the shank, each of said members being provided with a tool bit guideway disposed along the diametrical surface thereof in communication with the diametrical surface of the other member, said guideways extending in the same axial direction and in opposite lateral directions relative to the shank, a portion of each of said guideways being in communication with a portion of the other, a pair of tool bits each having one end portion respectively contained within one of said guideways with one of said tool bits overlying and in engagement with the other tool bit, one of said members being provided with a groove extending axially thereof along its diametrical surface, a pair of axially extending projections on the other member received in said groove on opposite sides respectively of the guideways to laterally align said members, a pair of screws spaced respectively on opposite sides of said guideways and engaged with both side members to retain the flat surfaces thereof in engagement, and a setscrew threadably received in each of said members and extendable longitudinally of the guideway therein for endwise supporting engagement with a tool bit disposed in the guideway.

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