Jan. 2, 1962 I. KONWAL 3,015,241

BORING BARS

Filed Nov. 17, 1958

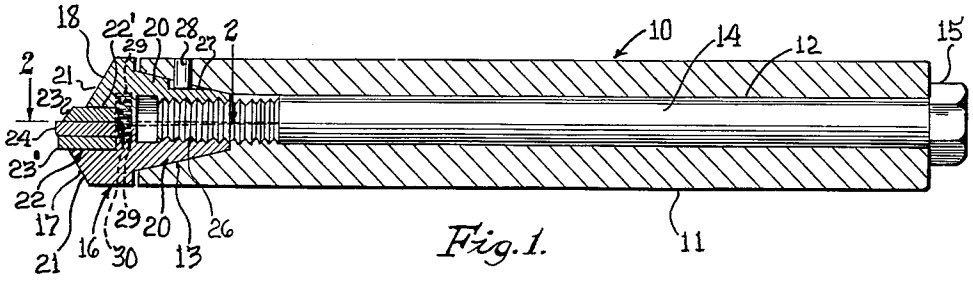


Fig. 1.

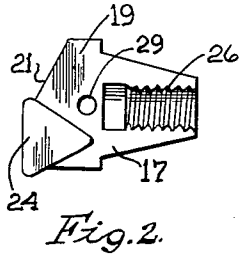


Fig. 2.

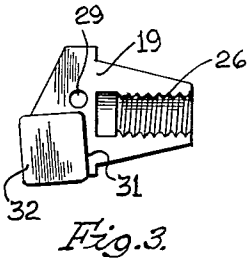


Fig. 3.

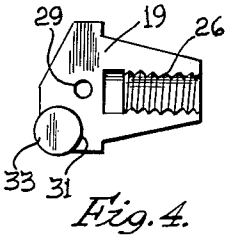


Fig. 4.

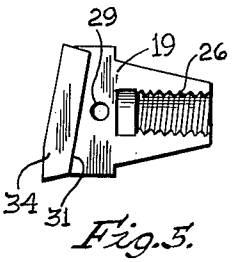


Fig. 5.

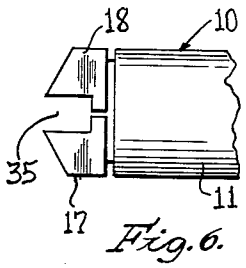


Fig. 6.

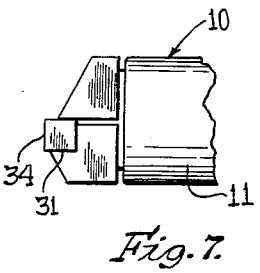


Fig. 7.

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BORING BARS

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This invention relates to new and useful improvements in boring bars and more particularly to a novel and useful construction of the bit holder thereof.

An object of this invention is to provide in a boring bar a bit holder constructed in a manner such that it will be firmly held at one end of the boring bar so that the cutter bit will be held in the holder with the maximum stability, prevented from chattering or other movement which would result in defective operation.

Another and equally important object of the invention is the provision of a bit holder made up of separable parts to afford speedy mounting of the cutter bit in the holder, the parts being cooperatively related with respect to each other and with respect to the boring bar such that as the clamping relationship between the cutter bit and the boring bar increases, the clamping of the separable parts of the bit holder will equally increase, thereby to hold the cutter bit and the holder with the maximum of stability.

Yet another and equally important object of the invention is the provision of a bit holder comprising separable parts, thereby affording forming in the confronting faces of the parts, cutter bit recesses of different shapes and contours, with the minimum amount of labor and machining.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

FIG. 1 is a longitudinal sectional detail view of the invention;

FIG. 2 is a plan view taken substantially on line 2—2 of FIG. 1;

FIGS. 3 to 5 are views similar to FIG. 2 but each showing a slightly modified form of construction;

FIG. 6 is a fragmentary side elevational view of the invention, showing a further modified form of construction of the bit holder;

FIG. 7 is a side elevational view of the bit holder shown in FIG. 5.

The drawings show the preferred form of construction of my invention. It is by such construction that the accomplishment of the several objects of the invention are contemplated.

Referring particularly to FIG. 1, a boring bar is indicated generally at **10** and includes a tubular shaft **11** having a longitudinal opening **12** formed therein. The opening **12** at one end terminates into a frusto-conically shaped socket **13**.

Mounted in the opening **12** is a draw bolt **14** having a head **15** by means of which the bolt **14** is rotated within the opening **12**. The bit holder embodying my invention is indicated generally at **16**. As shown in FIG. 1, the bit holder comprises two parts **17** and **18** of similar contour except as hereinafter pointed out. The parts are adapted to be arranged in confronting relation with respect to each other, and their confronting faces **19** are lapped or milled to a substantially true flat surface.

Each part **17** and **18** provides a tapered shank **20**, which, when the parts **17** and **18** are arranged in confronting relation with respect to each other, form a substantially truncated cone adapted to be drawn into socket **13**, as hereinafter explained.

The parts **17** and **18** at their head portions **21** are recessed as at **22** and **22'**, respectively, to receive a chip deflector **23** and a shim **23'**, between which the cutter bit **24** is arranged. The chip deflector **23** and shim **23'** are preferably formed of substantially hardened material and are intended and designed to protect the adjacent portions of the head portions **21** of the bit holder. Shim **23'** is designed and so positioned in relation to the bit **24** so that in the event the bit **24** is caused to break during actual use, the shim **23'** will absorb this breaking action and if such action is of such strength that would normally cause the breakage of the bit holder **16**, such action will cause the shim **23'** to break without damage to the bit holder **16**. When the chip deflector **23** and shim **23'** and the bit **24** are arranged within the recesses **22** and **22'**, there will be a slight spacing **25** between the confronting faces **19** of the parts **17** and **18**. By the provision of such space, when the bit holder is drawn into the socket **20**, the parts will be firmly clamped against the chip deflector **23**, shim **23'** and bit **24**, thus holding the parts within the bit holder **16** with the maximum of stability.

The shank **20** is provided with a threaded bore **26** whereby when the draw bolt **14** is rotated, the shank **20** of the bit holder will be drawn into the socket **13** for reasons herein set forth.

On one of the parts of the bit holder, for instance, the part **18**, there is provided a shoulder **27** which engages the pin **28** carried by the tube **11**. This pin **28** cooperates with the shoulder **27** to prevent rotation of the bit holder during the drawing or withdrawing of the same by action of the draw bolt **14**.

In order to maintain the parts **17** and **18** of the bit holder **16** together when removed from the socket **13**, I provide in each of the parts **17** and **18** aligned sockets **29**, and frictionally position in the sockets a coil spring **30**, the outside diameter of which is slightly larger than the diameter of the sockets **29** whereby a press fit results when the end portions of the spring **30** are mounted in the sockets.

The forms shown in FIGS. 3 to 5 inclusive are substantially the same as that shown in FIG. 2, with the exception that the recess **31** of each form is of a different shape to receive a different form of cutter bit **32**, **33** or **34**. The cutter bit **32** is usually used for through bore cutting. The cutter bit **33** is used in cases where fine boring is required. The shape of the cutter bit **33** permits it to be rotated to alternately present a cutting edge to the work. The cutter bit **34** is usually used for edge cutting.

In the form shown in FIG. 6, the shape **35** of the recess of the parts **17** and **18** is intended to receive a cutter bit for use as a spade tool of two cutter bits for roughing.

The cutter bit holder may have its parts formed with the recess of a design such as is capable of meeting any bearing or cutting requirement.

From the foregoing, it will be apparent that I have provided a tool which is simple in construction, easy of operation, and which will function to firmly hold the cutter bit and its holder in position with the maximum degree of stability. The construction affords easy and quick removal of the bit holder for the mounting or replacement of the cutter bit.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claim.

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

A boring tool comprising an elongated bar having a bore formed longitudinally therein, said bore opening at one end into a frusto-conically shaped socket, a bit holder comprising two parts arranged in confronting relation with respect to each other and provided in their confronting surfaces with a recess, said bit holder providing a shank shaped to conform to and fitting into said socket, said shank having a threaded opening formed longitudinally therein in alignment with said bore, a draw bolt having a head at one end portion adapted for bearing engagement with said bar and having an opposite end portion threaded for threaded engagement into an opening of said shank, a cutter bit assembly mounted in said recess and comprising a chip deflector and a shim and a cutter bit disposed between said chip deflector and said shim, said bit holder parts having formed in their confronting faces aligned openings transversely of and offset with respect to said recess, and a coil spring mounted in said aligned openings of said bit holder parts and frictionally engaging said parts to yieldably hold said parts together with the cutter bit assembly in said recess when said bit holder is detached from said bolt and removed from said socket of said bar.

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