April 24, 1956 H. E. SMITH 2,743,096

BIT HOLDER ASSEMBLY

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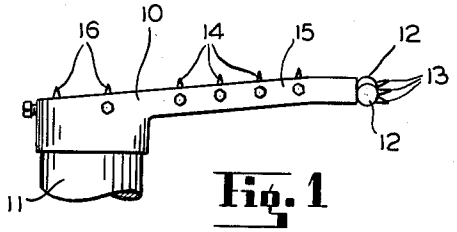


Fig. 1

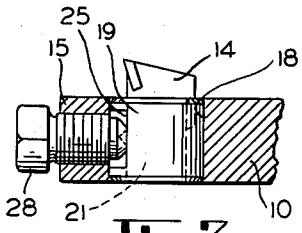


Fig. 3

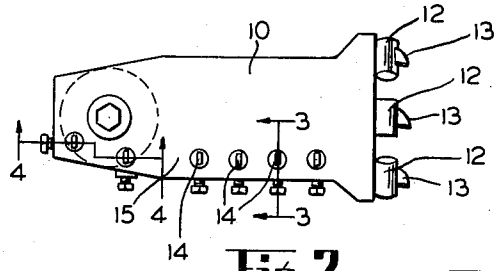


Fig. 2

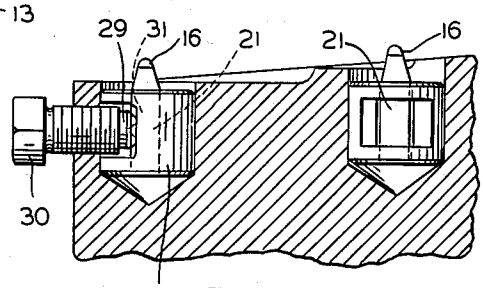


Fig. 4

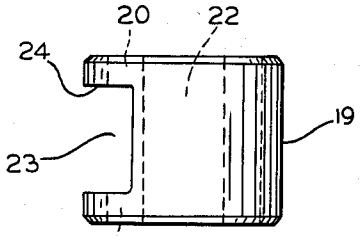


Fig. 5

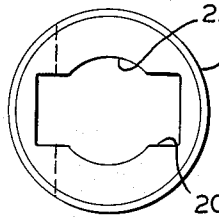


Fig. 6

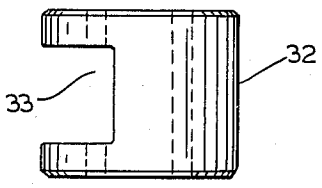


Fig. 7

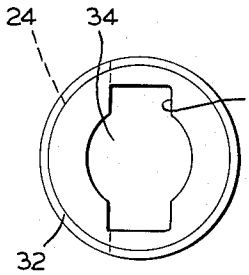


Fig. 8

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BIT HOLDER ASSEMBLY

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2 Claims. (Cl. 262—33)

This invention relates to bit holders for mining machines, and method of assembling the same. The principal object of the invention is to provide a simple, compact and efficient form of bit holder and method of assembly thereof, especially adapted for use along the edges of a relatively massive cutter support, in places where there is insufficient room for a bit holder of the conventional form used in kerf cutting machines.

The invention may best be understood by reference to the accompanying drawing, in which:

Figure 1 is a fragmentary side view of the outer end of a radial cutter arm of the kind used in mining machines of the boring type, to which several bit holders made in accordance with the invention are applied.

Figure 2 is a top view of the radial cutter arm shown in Figure 1.

Figure 3 is an enlarged detail section taken on line 3—3 of Figure 2.

Figure 4 is a detail section taken on line 4—4 of Figure 2.

Figure 5 is an enlarged detail side view of one form of holder plug removed from its socket in the cutter bracket.

Figure 6 is a plan view of the holder plug shown in Figure 5.

Figure 7 is a side view of a variant form of holder plug.

Figure 8 is a plan view of the plug shown in Figure 7.

Referring now to details of the invention shown in the drawings, the same is illustrated as applied to a cutter bracket **10** of the kind used at the outer end of a radial arm **11** forming part of a boring head of a mining machine. As usual, the cutter bracket projects forwardly from the arm **11** as the boring head is advanced toward the working face in a mine, so as to cut a circular kerf in said working face. A plurality of conventional cutter bit holders **12, 12** may be mounted as usual along the front edge of the cutter bracket, said conventional bit holders each consisting of a bit block with the usual form of elongated bit-receiving aperture in which a bit **13** is detachably secured by a set screw, further details of which need not be shown herein, as such bit blocks are well known in the art. The bits **13, 13** of said conventional bit stocks **12** project as usual at varying angles from their respective bit blocks, so as to cut a relatively wide circular kerf in advance of the cutter bracket **10**.

Referring now to the novel form of bit holder of the present invention, it will be understood that in some instances it is also desirable to provide one or more cutter bits **14, 14** along the leading edge **15** of a cutter bracket **10** and projecting radially outwardly from the latter, so as to insure ample clearance for the cutter bracket in the circular kerf which is initially produced by the cutter bits **13** at the front end of said bracket. Such auxiliary bits are also advantageous in case a change in axial direction of advance of the boring may be effected in the head during cutting.

In addition, it is also advantageous to provide one or more cutter bits **16, 16** projecting from the extreme end of the radial arm, as shown in Figures 1 and 2, so as

to prevent "heeling" of the arm when the axial direction of advance of the boring head is changed. The present invention is especially directed to a simple, compact and efficient form of cutter bit holder which is capable of being readily applied in any desired location in an exposed face of any moving cutter member, adjacent one edge thereof.

Figures 3, 5 and 6 show the construction and assembly of a cutter bit holder for the auxiliary bits **14, 14**, when arranged along the leading edge **15** of the cutter bracket **10**. Each of said bit holders is formed by drilling a circular bore or hole **18** in the outer face of bracket **10** of proper diameter and depth to receive a cylindrical holder plug **19** in close fitting engagement therein. The holder plug is formed with an aperture **20**, extending axially therethrough, of elongated rectangular shape in transverse section of proper size to receive the shank **21** of a cutter bit **14** in endwise loose fitting engagement therein. The aperture **20** may also have opposed arcuate grooves **22** formed lengthwise along their opposite longer sides, to afford access to the bottom of the bit shank by a suitable tool, for removing the bit when necessary.

Each cylindrical plug **19** has an opening **23** extending through one side wall thereof, and communicating with one end of the bit receiving aperture **20** so as to expose a face **25** of bit shank **21** for engagement by a set screw **28** when the bit is in place in said aperture. In the preferred form shown herein, the opening **23** is formed by milling a transverse slot **24** across the side wall of the plug **19**, as shown in Figures 3 and 5, of sufficient depth to intersect the bit receiving aperture **20**.

The set screw **28** is threaded through the adjacent wall of the cutter bracket on an axis substantially at right angles to the axis of the plug receiving bore **18**. The set screw may have a reduced inner end portion **29**. When said set screw is screwed home with its inner end **29** in locking engagement against bit **14**, as shown in Figure 3, said set screw also forces the cylindrical plug against the rear face of the bore **18**, so as to secure both the bit and plug in place in the bracket. When the set screw is unscrewed from engagement with the bit, the reduced end of the set screw may engage the overhanging shoulder **25** of the transverse slot **24**, to retain the plug loosely in the bore **18**.

Figure 4 shows two variant forms of bit holding plug assemblies, the assembly at the right side of this figure being the same as that shown in Figure 3; the assembly at the left side being modified so that the set screw **30** can be engaged with a side face of a bit shank **31** instead of to the front edge of the shank. In the last mentioned variant form of assembly, the cylindrical holding plug **32**, shown in detail in Figures 7 and 8, is the same form as the plug shown in Figures 5 and 6, excepting that the side aperture **33** in the plug opens into the bit receiving aperture **34** at one side of the latter. In other respects the construction and operation is the same as previously described in connection with the form shown in Figures 3, 5 and 6.

Among the advantages of the bit holding assembly disclosed herein is that it permits a bit to be secured in any desired position adjacent the edge of a cutter bracket, without requiring any conventional conformation of bit holder. All that is necessary is to drill a bore **18** in the desired place for a holder plug, and an intersecting threaded bore for a set screw. The holder plug, bit, and set screw are then assembled in the manner shown and described. A further advantage is the arrangement whereby the set screw can be partially withdrawn to release the bit, but still hold the plug in place in the bore.

Although I have shown and described a preferred form of my invention, it should be understood that the disclosure is only illustrative and should not be understood

to limit or confine my invention except by the appended claims.

I claim:

1. A bit holder assembly for mining machines including an elongated cutter support having a corner edge generally rectangular in cross section, said edge having a bore in one face generally parallel to the adjacent other face, a cylindrical plug adapted for fitting engagement in said bore, said plug having an elongated slot extending axially thereof for receiving the shank of a cutter bit in endwise slidable engagement therein, said cutter support edge having a threaded aperture through the adjacent side wall thereof communicating with said bore substantially at right angles thereto, said plug having an aperture through its side wall adapted to have registering relation with the threaded aperture in said cutter support when the plug is inserted in said bore, to permit the inner end of a set screw to engage a bit in said bit-receiving aperture in said plug to secure both said bit and plug in said bore.

2. The structure of claim 1, wherein the set screw aperture in the plug is formed by a transversely extending slot in the side wall of the plug intersecting the bit receiving aperture, and having an overhanging shoulder for engagement by the end of the set screw to retain the plug in the bore when the screw is removed from engagement with the bit.

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