Oct. 7, 1952 A. O. BRUESTLE 2,613,069

MINING MACHINE BIT AND BLOCK

Filed Oct. 15, 1948 2 SHEETS—SHEET 1

FIG. 1.

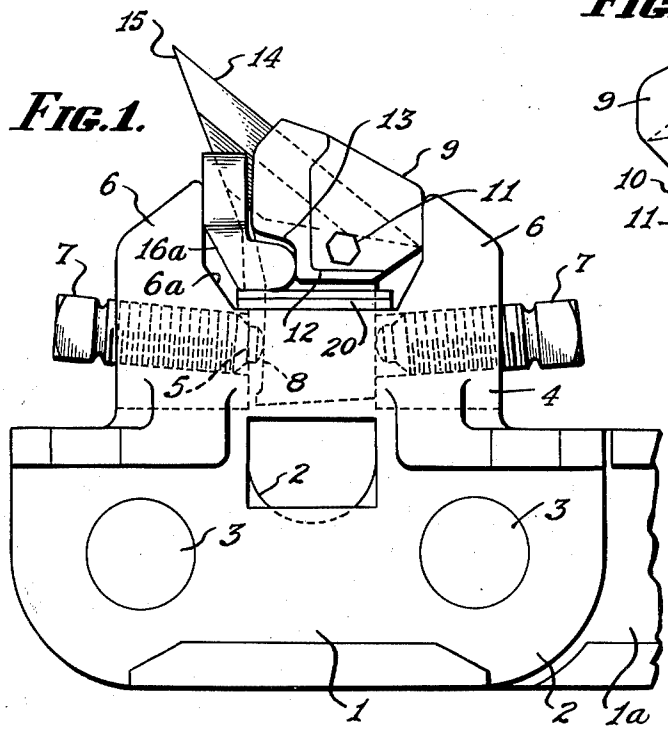
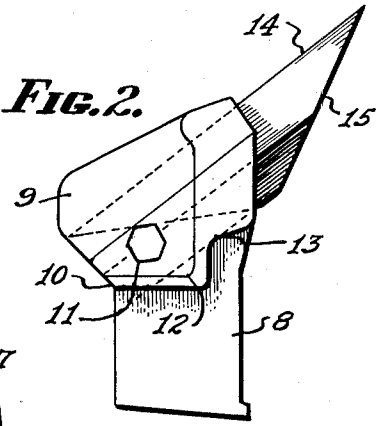


FIG. 2.



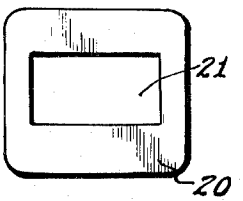


FIG. 7.

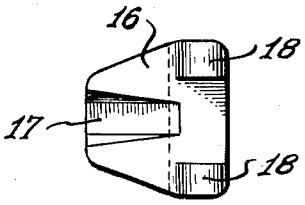


FIG. 3.

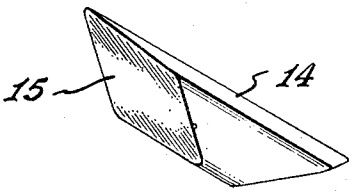


FIG. 6.

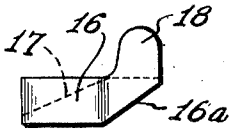


FIG. 4.

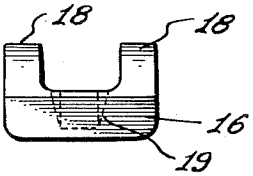


FIG. 5.

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FIG. 8.

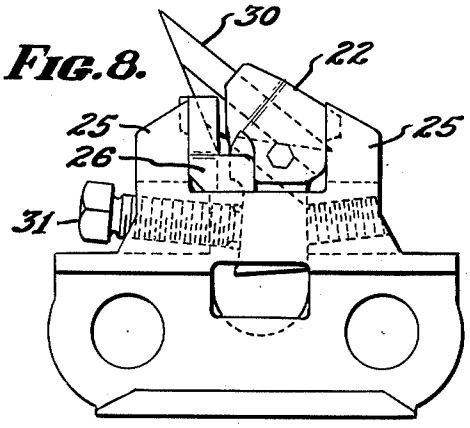


FIG. 9.

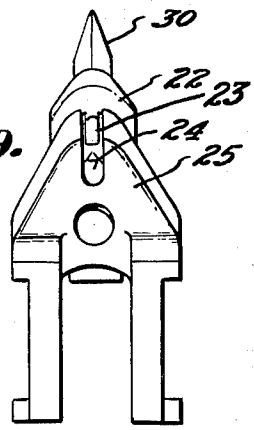


FIG. 10.

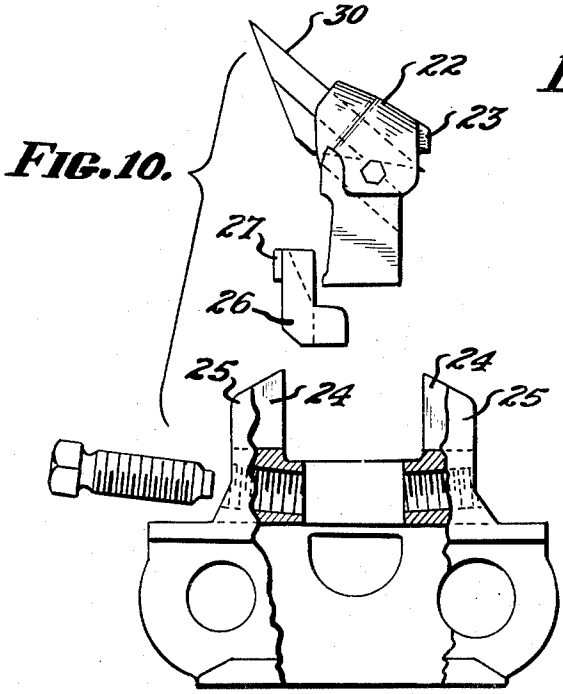
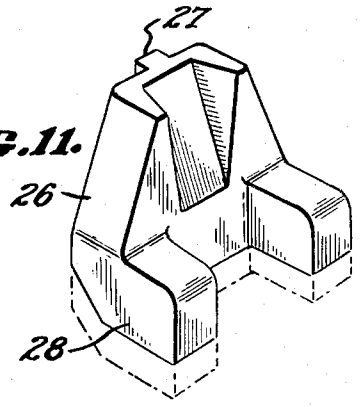


FIG. 11.



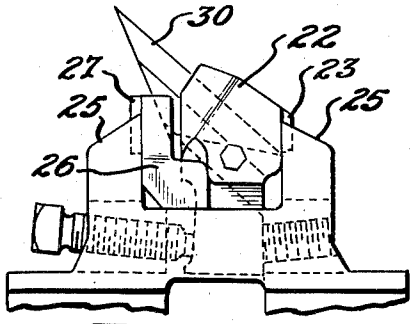
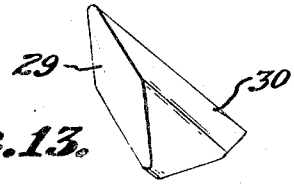


FIG. 12.

FIG. 13.



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UNITED STATES PATENT OFFICE

2,613,069

MINING MACHINE BIT AND BLOCK

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Application October 15, 1948, Serial No. 54,779

4 Claims. (Cl. 262—33)

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This application is a continuation-in-part of my copending application Serial No. 593,045, filed May 10, 1945, and now abandoned for Mining Machine, Bits and Blocks.

In mining machinery for use in cutting into veins of coal or the like, provision is made for supporting and feeding a closed chain formed of hinged-together blocks which serve to mount and support bit holders and bits in such a way that the cutting point or end of the bit enters into cutting relation with the mineral vein.

My present invention is directed to devices of the general type shown and described in United States Patent No. 2,039,747 to Edwin P. Stenger and myself dated May 5, 1936. In this patent there is described a construction having an arrangement of bit block, bit holder, and bit in which the holder has a shank which is thrust into a socket in the bit block and the bit block has thereon upwardly projecting lugs forming a bit holder head recess into which the head of the bit holder is positioned when the holder shank is thrust into the socket. A set screw is arranged in the bit block to engage the side of the shank, which is the same side as that wherefrom the bit projects, and there is at least normal working clearance between the socket and the shank of the bit holdler, so that when the set screw is tightened, the shank of the bit holder will tilt, thus tilting the entire bit holder on the point of bearing of the bit and an abutment retained on one of the upwardly projecting lugs, thus wedging the head of the bit holder tightly against one of the upwardly projecting lugs with the bit itself against the other abutment on the other upwardly projecting lugs. By this arrangement, the bit is held tightly in place by the abutment positioned on one of the upwardly projecting lugs and the bit holder head itself.

In using a mining machine of this type, it is advantageous to be able to change the gauge or projection of the bit either in relation to other bits, or in relation to the bit block. This is desirable when cutting certain kinds of formations of coal and it is also desirable to be able to advance the cutting point of the bit when it has been shortened by sharpening.

It is also an advantage to be able to easily and quickly reverse the cutting direction of the bit so the drive of the chain may be reversed. All of this must be done under ground in a confining space in a coal mine and often in total darkness by the sense of feel alone.

It is an object of the present invention to retain all of the features shown in the above referred to Patent No. 2,039,747, but to supply an

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improved reversible arrangement over the structure of that patent in that the abutment which rests on the upwardly projecting lugs is a single piece in itself which is held in place by the bit and the bit holder head.

The construction of my present invention permits, since the abutment does not have a definite position in connection with the bit block and the upwardly projecting lug thereof, the use of washers or shims under the abutment, thus changing the projection or gauge of the bit in the holder. It also permits me to supply abutments of different relative heights so that by interchanging them, the point of contact between the bit and the abutment is varied as to the bit block, and thus the gauge of the bit is adjustable.

It is a further object of my invention to provide a bit holder and block which may be quickly and easily reversed in total darkness by the sense of feel alone and where different sized abutments may be inserted and removed quickly and easily by the fingers.

These and other objects of my invention which will be set forth hereinafter or which will be apparent to one skilled in the art upon reading these specifications, I accomplish by that construction and arrangement of parts of which I shall now describe an exemplary embodiment.

Reference is made to the drawings which form a part hereof and in which:

Figure 1 is a side elevation of a chain block, bit holder and bit assembled with the abutment piece shimmed up in accordance with my invention.

Figure 2 is a side elevation of the bit holder and bit.

Figure 3 is a face view of an abutment.

Figure 4 is a side elevation of the abutment piece shown in Figure 3.

Figure 5 is an end view of the abutment piece shown in Figure 3.

Figure 6 is a perspective view of the bit.

Figure 7 is a plan view of one of the washers or shims.

Figure 8 is a side elevation of a modified form of chain block bit holder and bit assembly with an abutment piece in place.

Figure 9 is an end elevation of the bit block shown in Figure 8, taken from the right side of Figure 8.

Figure 10 is an exploded view of Figure 8 showing the relative position of the different parts making up Figure 8.

Figure 11 is a perspective view of the abutment shown in Figures 8 and 10.

Figure 12 is a side elevation of a bit holder head

and bit in place similar to that shown in Figure 8 but with an abutment which spaces the cutting edge of the bit further from the bit block.

Figure 13 is a perspective view of the cutting end of the bit.

Briefly, in the practice of my invention, I provide an abutment which is held against the upwardly projecting lug of a bit block by the cutting edge of the bit and also held in position by the head of the bit holder which is positioned between two legs of the abutment. When the head and bit is tilted by the set screw contacting the shank of the bit holder, the surface of the abutment acts as a pivot point or fulcrum and the bit and bit head are thus wedged between the abutment and the opposite upstanding lug to the rear of the bit holder head. When it is desirable to lengthen the gauge of the bit, I use an abutment having a fulcrum point spaced further away from the bit block by providing thicker legs on the abutment. Since the wedging action which holds the bit in place is between the abutment and the opposite upstanding lug, the movement of the fulcrum or pivot point in relation to the bit block does not affect this wedging action.

In some instances it may be desirable to place shims under the abutment piece instead of using an abutment piece with thicker legs.

In the following description, I will first describe the form shown in Figures 1 to 7, inclusive, and then describe the modification shown in Figures 8 to 13, inclusive.

Referring first to Figure 1, the chain block or bit block 1 is formed with a pair of depending webs 2 in which are hinge pins 3, 3 which hold the connecting links 1A together in the usual manner. The block is open between the webs, and has a body portion 4 connecting the webs which has a central socket portion 5. Projecting upwardly from the portion 4 at the two ends thereof are the lugs 6, 6, the inner faces whereof are spaced a distance which will embrace fairly closely the bit holder plus the bit and abutment piece, when assembled into position.

There are two threaded holes in the main body portion 4 for reception alternatively of bit holder engaging screws 7. The bit holder has a shank 8 which is of a dimension which will fit somewhat loosely in the socket of the bit block (this is exaggerated in the drawings). It has a head 9 which is provided with a socket 10 arranged at a slant into which the bit will fit snugly, engaging with one of its faces on a cross pin 11, thus restraining the inward movement of the bit.

The head 9 is thicker than the shank 8 forming a shoulder 12, and this shoulder is cut up into the head in curved recesses 13, 13 at each side for engaging with or receiving the abutment piece and holding it in position, as will be described. The shoulder 12 is normally spaced from the portion 4 of the block when the shank is inserted into the socket of the bit block, since the part of the abutment which engages the bit alone regulates the position of the head.

The bit 14 is shown and to which the particular head of the bit holder is arranged to conform is one which is diamond shaped in cross section and shaped as a truncated triangle. Such a bit is reversible in the head of the bit holder. The faces 15 of the bit are flat, as would result from cutting the bits from a piece of diamond shaped bar stock.

The abutment piece is in the form of a body portion 16, having a groove 17 in its inner face which will accommodate the flat face 15 of the bit at a point near the truncated apex of the triangular formation. The width of the portion 16 is about that of the bit holder head. The abutment piece has two ears or legs 18, 18, shaped so as to lie within the recessed portions 13, 13 of the bit holder head. The ears are preferably flat on the bottom so as to rest on the body portion 4 of the bit block between the lugs. As illustrated, the lugs 6 may have a sloping face 6a where they connect to the body portion and the abutment is given a like shape at 16a.

Referring to the assembly view of Figure 1, it will be noted that the abutment piece is arranged so that when it rests on the block portion 4 its ears underlie the shoulder portions 13, and its face engages the face of the bit which lies in the groove 17. Since the abutment piece rests on the top of the body portion 4, the result of the construction is that the holder is essentially pivoted at the point of engagement of the bit with the abutment. This tends to cause the holder shank to lie at an angle against the bit block socket wall which is on the same side as the bit.

With the parts so located, when the bit holder screw 7 which enters the block at the same side that the bit is located is turned in, it will engage the shank and push it against the opposite wall of the block socket. Even with a fairly close (commercial fit) of the holder shank in the socket, this action takes place. The result is that the bit holder rocks slightly on the pivot of the bit on the abutment. The butt of the bit holder away from the bit rides up slightly on the lug of the block away from the bit side and this jams the bit and holder into place very tightly, resisting looseness and dislodgement to a very high degree. As already noted, this objective formed one of the features of the Stenger and Bruestle patent.

To reverse the position of parts now described the screw which is in engagement is released whereupon the bit holder will come out readily. It can then be turned around and dropped into place this time with the abutment in like position but simply turned around also. When so reversed in position the screw on the opposite side of the block will be turned down, again holding and wedging tightly the bit holder and bit.

If it is desired to elevate the bit holder in the block, a washer or washers 20 may be employed. These washers have an opening 21 which will receive the bit holder shank and rest on the top of the bit block body. As a result, the abutment will now rest on the washers or shims rather than on the top face of the bit block between the two lugs.

In the Stenger and Bruestle patent above identified, the reversible form illustrated required two abutments which were provided with pins for holding them in place against the bit block lug faces. In the present construction the same end is accomplished with but a single abutment piece, and also there is no need for fitting of pins and sockets for location of the abutments, since the clamping action holds the otherwise free abutment, which cannot ride up because of the ears underlying the recessed shoulder on the face of the bit holder.

Figures 8 to 13, inclusive, show a modification of my invention wherein the gauge of the bit may be changed without the necessity of inserting washers or shims.

In this modification, the bit holder 22 is similar

to the bit holder 9 and it may have a rearwardly projecting key portion 23 which slides in a slot 24 in the upstanding portions 25 of the bit block.

The abutment 26 may also be provided with a key portion 27 which is insertable in the slot 24 of the upward projection 25 against which the abutment rests.

The legs or ears 28 in this case are of varying thickness as indicated by the broken lines in Figure 11.

Figure 8 shows the bit holder in bit holding position with an abutment having relatively shallow legs or ears 28, while Figure 12 shows the same mechanism with an abutment having thicker legs or ears 28.

Since the abutment 26 is firmly positioned against the inner face of one of the upstanding lugs 25, the difference in thickness of the legs 28 merely raises or lowers the pivot or fulcrum point in reference to the bit block.

While I have shown keys 23 and 27 on the bit holding head and the abutment and while I have shown slots 24 in the upwardly projecting lugs 25, I do not intend to be limited to these features since the abutment 26 is held in place by the legs 28 straddling the shank of the bit holder 22 and is held against the surface of the bit holder by the lower cutting face 29 of the bit 30.

A decided advantage in this construction is the elemination of the shims 20. In some instances where it is necessary to work in a dark, confining place in a mine and a shim is dropped on the floor, it is difficult to find. However, the relatively large abutments 26 are more easy to locate and place in position within the recess between the projecting lugs.

When it is desirable to reverse the bit, it is only necessary to either remove the screw 31 and insert it in the opposite hole, or as is more often done, to provide a screw in both holes at all times. The bit holder carrying the bit is removed from the block and the abutment 26 is moved over against the opposite lug. The bit holder and bit is then turned and reinserted in the bit block and tightened into place.

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

1. In a bit block and bit holder combination in which the bit block has a socketed body portion with two upwardly projecting lugs forming a bit holder head recess and clamping screws to engage the bit holder shank at either side; a bit holder having a head which retains the bit so as to project a cutting edge with a slanted underside, said bit holder having a shank which has some freedom of lateral movement in the socketed body portion, and an abutment piece separate from the bit block, said abutment piece and the bit holder having interengaging elements whereby the head holds down the abutment piece in a position between the two upwardly projecting lugs, said abutment piece being arranged to engage the slanting underside of the cutting edge of the bit, and to engage the upwardly extending face of one of the lugs when the bit holder head is in engagement with the upwardly extending face of the other of the lugs, and in which the abutment presents an abutting surface to the bottom of the bit holder head recess when in engagement with the bit and one of the block lugs and washer means is located about the bit holder shank resting on the bottom of the recess thus elevating the point of abutment and adjusting the position of the bit holder head without altering the relation of the abutment and the bit.

2. In a bit block and bit holder combination in which the bit block has a socketed body portion with two upwardly projecting lugs with parallel opposed faces forming a bit holder head recess and a clamping screw to engage the bit holder shank; a bit holder having a head which retains the bit so as to project a cutting edge with a slanted underside, said bit holder having a shank which has some freedom of lateral movement in the socketed body portion, and an abutment piece separate from the bit block, said abutment piece being arranged to engage the slanting underside of the cutting edge of the bit, and the upwardly extending face of one of the lugs in the bit holder head is in engagement with the upwardly extending face of the other of the lugs, said abutment piece having legs projecting toward the bit holder head and the head having recesses into which said legs project, whereby the head and bit alone hold the abutment piece against a portion of the bit block surrounding the socket and between the two lugs.

3. In a bit block holder combination in which the bit block has a socketed body portion with upwardly projecting lugs with parallel opposed faces forming a bit holder head recess and a clamping screw to engage the bit holder shank; a bit holder having a head which retains the bit so as to project a cutting edge with a slanted underside, said bit holder having a shank which has some freedom of lateral movement in the socketed body portion, and an abutment piece separate from the bit block, said abutment piece having a bifurcated portion straddling the bit holder head, whereby the head and the slanting underside of the cutting edge of the bit holds the abutment piece against a portion of the bit block surrounding the socket and between the two lugs.

4. The combination set forth in claim 3 in which the ends of the bifurcated portion of the abutment piece presents an abutment surface to shoulders on the bit holder head when in engagement with the bit.

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