July 24, 1928.

1,677,950

N. K. BOWMAN

BIT

Filed Aug. 21, 1926

Fig. 1.

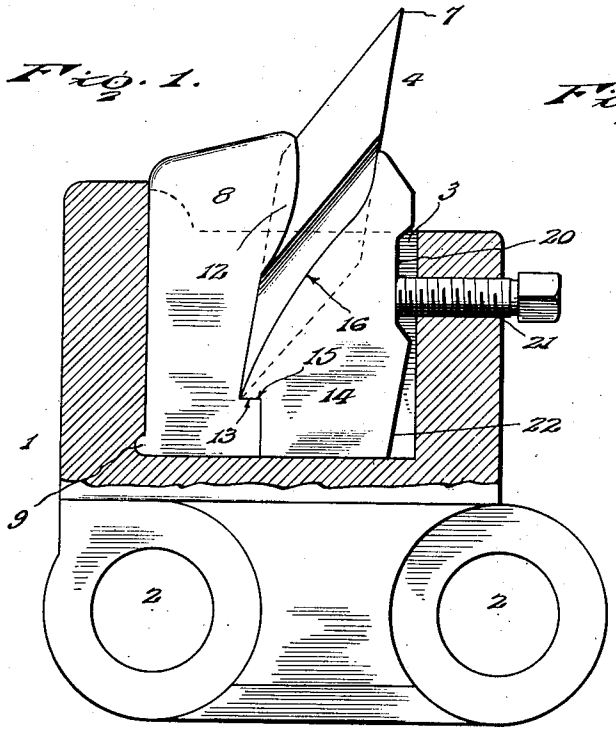


Fig. 3.

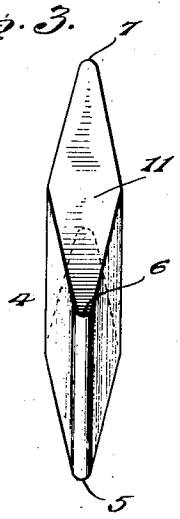


Fig. 2.

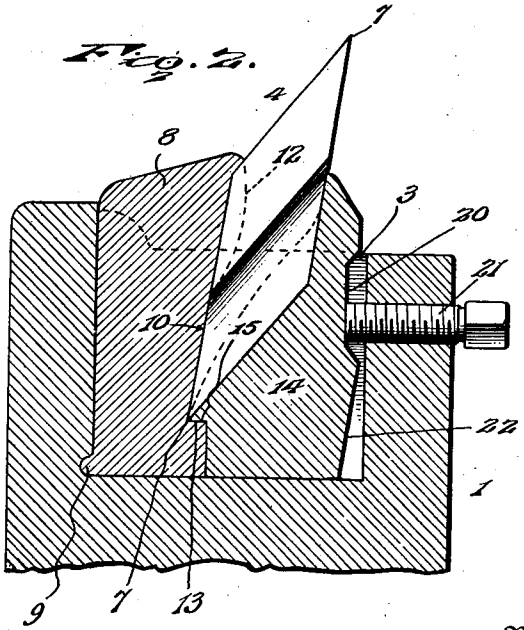


Fig. 4.

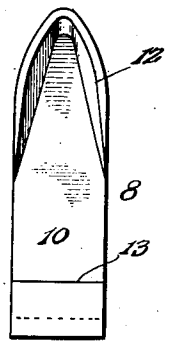
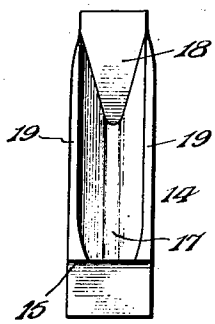


Fig. 5.



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UNITED STATES PATENT OFFICE.

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BIT.

Application filed August 21, 1926. Serial No. 130,636.

This invention relates to coal mining machinery and has special reference to the bits and bit mounting means. The invention has for its object the provision of a bit especially adapted for cutting through rock, and also has for its object the provision of bit-holding means which will firmly hold the bit while in use and may be very easily and quickly manipulated to permit release of a worn out bit or the insertion of a new bit. The invention is illustrated in the accompanying drawing and consists in certain novel features which will be particularly pointed out in the claims appended to the following description.

In the drawing:

Figure 1 is a sectional elevation of a chain lug having my improved bit mounted therein in accordance with the present invention;

Fig. 2 is a view similar to Fig. 1 showing the bit in elevation and the holder and wedge in section;

Fig. 3 is a front elevation of the bit;

Fig. 4 is a front elevation of the holder; and

Fig. 5 is a rear elevation of the wedge.

The lug, indicated as an entirety by the reference numeral 1, is of the usual general formation, having eyes 2 at its inner corners to receive pivot bolts whereby it will be connected to and between chain links. In the outer portion of the body of the lug is a chamber or recess 3 receiving the bit, the bit holder and the wedge.

The bit 4 is rhomboidal in side view and in cross section is of a flat diamond shape having its acute angles rounded off, as indicated at 5 and 6, thereby forming cutting points 7 at the diametrically opposed sharper angles of the rhomboid. In actual practice, the bit is so disposed that one cutting point 7 will be projected forwardly and outwardly and thereby properly positioned to penetrate the material upon which the machine is to act, and it will be obvious that, when one point is worn down so as to be no longer useful, the bit may be reversed and the opposite sharp point utilized as the cutting instrumentality. The time spent in sharpening bits of the ordinary construction is thus saved and a very substantial reduction in the cost of operation and maintenance is effected. The particular form of the bit shown and described also facilitates economical production. In manufacturing the bits, I provide a long blank which is rolled to the flattened diamond cross section shown in Fig. 3, and this long strip or blank is run through a cutting machine which, at regular intervals, cuts through and across the blank in oblique relation to the side edges thereof so that the blank will be rapidly sub-divided into short sections, each section constituting a finished bit. Obviously, the cost of manufacture by this process is so slight as to be negligible.

The holder 8 is a solid block having its greater dimension equal to or slightly greater than the depth of the recess or chamber 3 so that the block may fit closely between the top and bottom walls of the said chamber and against the rear wall thereof, a small lug or teat 9 being formed upon the rear side of the holder at the inner end thereof to engage a corresponding seat in the rear wall of the chamber 3, as will be understood upon reference to Figs. 1 and 2. The front face 10 of the holder 8 is disposed obliquely relative to the longitudinal axis of the lug and is flat so that it will engage firmly against the rear flat face 11 of the bit and thereby furnish a strong abutment to receive the thrust of the bit in operation. At its outer end portion, the holder is provided with a rib or lip 12 which extends along the side portions of the holder and across the end thereof to provide an inwardly diverging seat or socket which fits over the outer portion of the bit at the rear end thereof. This socket-forming rib 12 fits closely about the bit so that it resists any tendency of the bit to rotate or move laterally and the holder is provided at its inner end on its front face with a forwardly projecting shoulder 13 cooperating with the socket element 12 to maintain the bit in its operative position. Within the chamber 3, in advance of the bit and the holder 8, is disposed a wedge 14, the inner end of which is adapted to fit squarely against the inner wall of the said chamber and near its inner extremity, on its rear side, the wedge is provided with an overhanging shoulder 15 adapted to rest against the shoulder 13 of

the holder, the holder and the wedge having a right angular formation at these engaging points so that relative twisting or lateral movement between the wedge and the holder will be prevented. The rear portion of the wedge is cut away, as indicated at 16, from the shoulder 15 to the outer extremity of the wedge, and a groove or recess 17 is formed along this cut-away portion, the forward wall 18 of which is disposed obliquely and parallel with the front face of the holder. The side walls 19 of the groove or seat 17 are properly shaped to converge toward the bottom of the seat so that the inner portion of the bit will be engaged thereby, as shown clearly in Fig. 2, and the bit, consequently, firmly held by and between the holder and the wedge. It will also be noted that there is an open space at the sides of the device which extends from the outer ends of the holder and the wedge to the points of engagement of the shoulders 13 and 15 so that the clearance will be sufficient to permit the insertion or removal of a bit upon slight releasing movement of the wedge. The front face of the wedge is provided between its inner and outer ends with an elongated notch 20 receiving the inner end of a set bolt 21 mounted in a threaded bore in the front wall of the lug 1 in such position that it is adapted to bear against the bottom of the said notch between the ends of the same. Between the notch and the inner end of the wedge, the front face thereof is slightly inclined, as indicated at 22, to facilitate the insertion of the parts in the lug after the holder and the bit have been assembled with the wedge. It will be understood that by this formation the assembled holder, bit and wedge may be inserted endwise into the chamber 3 until the holder and wedge impinge against the inner wall of the chamber, and then a rear movement imparted thereto to engage the lug 9 within the seat provided for the same.

It is also to be noted that the end walls of the notch 20 prevent accidental release and loss of the wedge and bit in the event that the set bolt 21 should not remain as tight as it is set. Obviously, the set bolt is turned home against the wedge so as to clamp the wedge against the bit and the bit against the holder, the holder being, in turn, clamped thereby against the rear wall of the chamber 3 so that the parts are very tightly secured with the front face of the holder, and the shoulder 13 forms a stop and abutment which effectively prevents the bit yielding under the thrust imposed thereon in the operation of the machine. It sometimes happens that, in actual operation, the set bolt 21 is loosened a half turn or possibly a full turn but such loosening of the bolt is not sufficient to permit removal of the bit and the bit cannot be removed unless the wedge is withdrawn. The shoulders at the ends of the notch 20 prevent withdrawal of the wedge unless the set bolt be loosened sufficiently to clear said shoulders or end walls and the possibility of the set bolt being loosened to this extent by the mere operation of the machine is so remote that it may be disregarded.

In many coal deposits, the vein of coal is "thin", in the parlance of the industry, and when this thin vein is cut according to the prevailing practice it is exceedingly apt to be broken into such small particles as to be merely dust and be undesirable commercially. No efficient bit has been provided heretofore for cutting through the strata of rock above or below the vein of coal, but my improved bit is especially adapted for and is intended to permit the tunnelling of the rock below the vein of coal so that the coal may be subsequently broken down in good commercial condition. By tunnelling through the rock before breaking down the coal vein, the operators may clean away all of the broken rock and dust before breaking down the coal so that, when the coal is broken down, it will be clean and of good marketable quality. Inasmuch as this method eliminates the necessity of screening or cleaning the coal, the cost of mine operation is very materially reduced.

Having thus described the invention, I claim:

1. The combination of a mining machine chain lug, a holder seating in the lug and having a forwardly and outwardly inclined straight front face, a wedge seating in the lug in advance of the holder and having its rear face disposed obliquely relative to the front face of the holder, a rhomboidal bit disposed between the holder and the wedge and held by the same, the opposed faces of the holder and the wedge conforming to the bit so as to closely engage the same and the entire area of the rear end face of the bit abutting the front face of the holder, and means mounted in the lug and engaging the wedge to prevent withdrawal from the lug.

2. The combination with a mining machine chain lug, of a holder seating in the lug, a wedge seating in the lug in advance of the holder and provided on its front face with spaced shoulders, a retaining bolt mounted in the lug and engaging the wedge between said shoulders, and a bit disposed between the holder and the wedge and seating in the front face of the holder and the rear face of the wedge.

3. The combination with a mining machine chain lug, of a holder seating in the lug and having its front face formed with an obliquely disposed portion and having a transverse shoulder at the inner end of said obliquely disposed portion, a socket formed around the outer end portion of such ob-

liquely disposed part of the holder, a wedge seating in the lug in advance of the holder and having the inner portion of its rear face obliquely disposed with respect to the holder and constructed with a longitudinally extending seat having its outer end wall parallel with the obliquely disposed face of the holder, a bit disposed between the holder and the wedge and fitting in the socket on the holder and the seat on the wedge, and means mounted in the lug and engaging the wedge to prevent withdrawal.

In testimony whereof I affix my signature.

NEWTON K. BOWMAN.