Jan. 19, 1932. E. J. NEWBAKER 1,841,907

APPARATUS FOR MINING

Filed Nov. 21, 1929 2 Sheets-Sheet 1

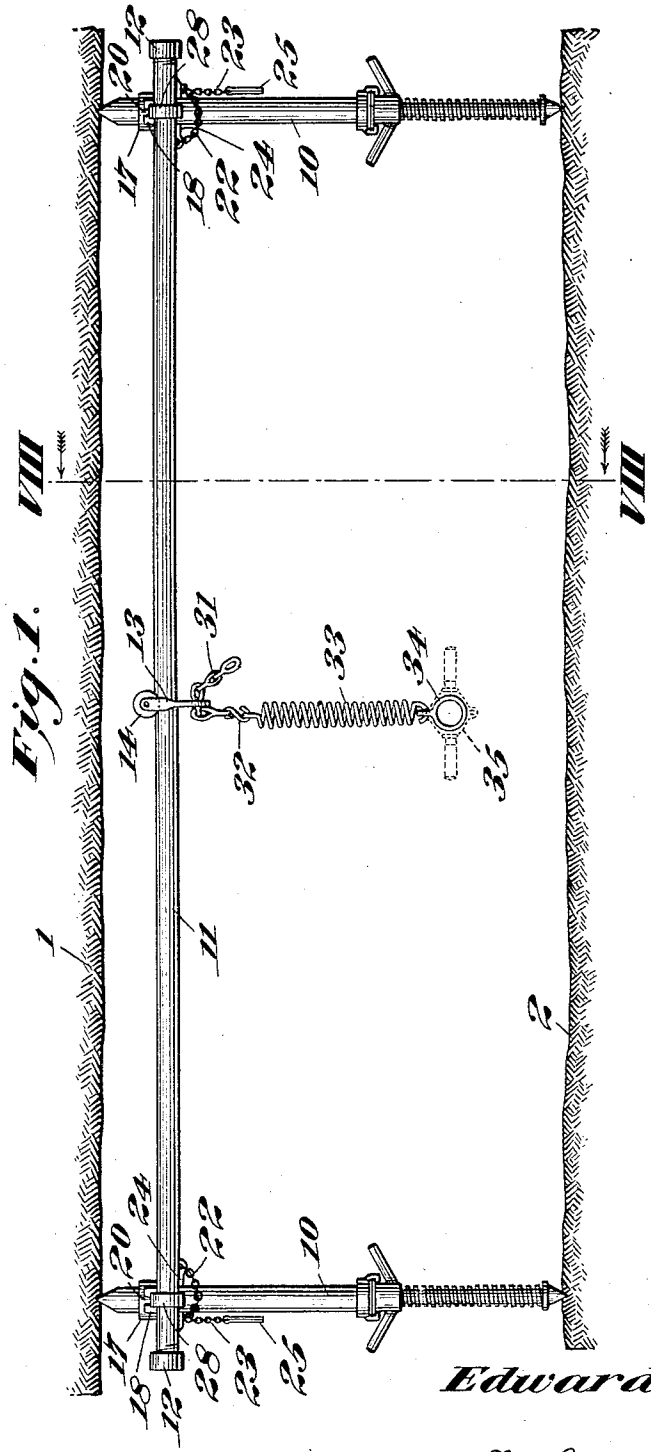


Fig. 1.

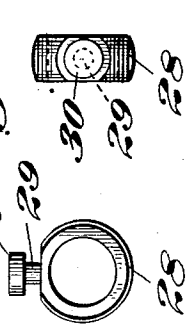


Fig. 6. Fig. 7.

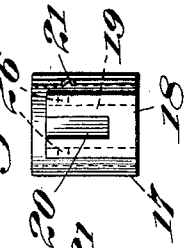


Fig. 5.

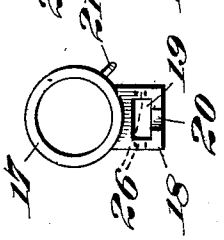


Fig. 4.



Fig. 3.

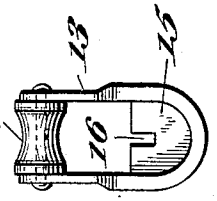


Fig. 2.

Inventor

Edward J. Newbaker.

By Geo. E. Thackray

Attorney

Jan. 19, 1932. E. J. NEWBAKER 1,841,907

APPARATUS FOR MINING

Filed Nov. 21, 1929 2 Sheets-Sheet 2

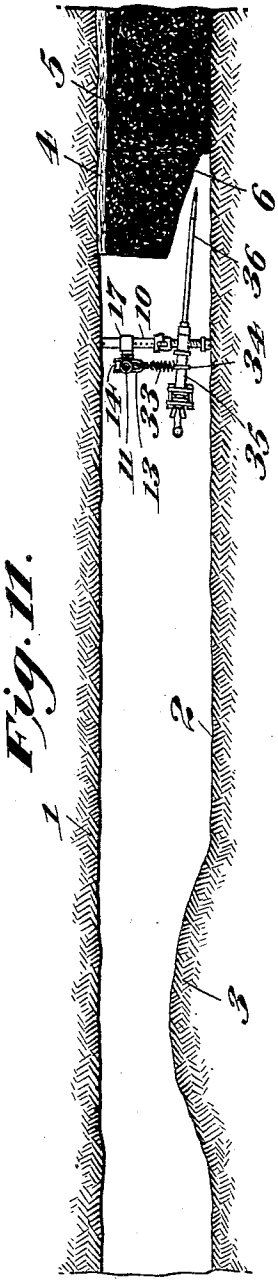


Fig. 11.

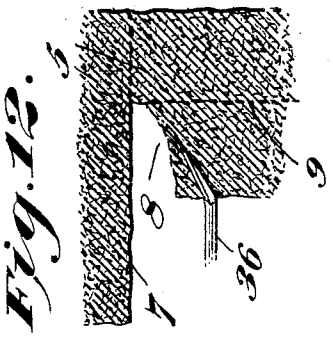


Fig. 12.

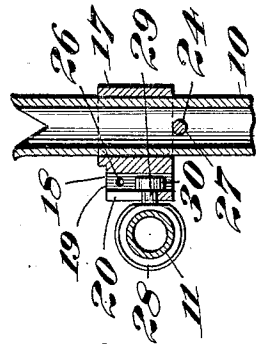


Fig. 9.

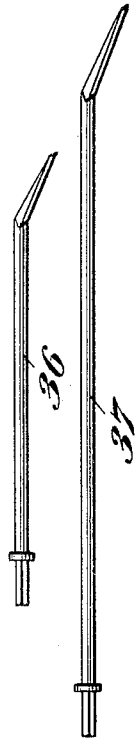


Fig. 10.

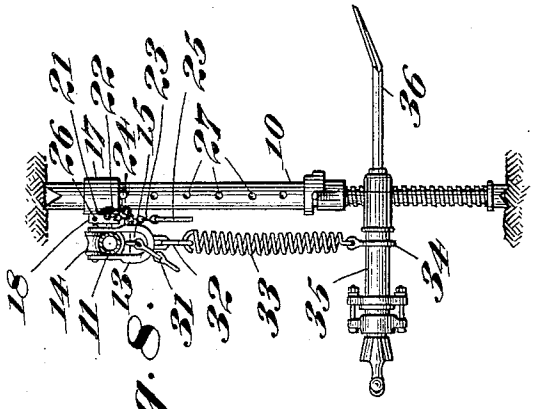


Fig. 8.

Inventor

Edward J. Newbaker.

By Geo. E. Thackray.

Attorney

Patented Jan. 19, 1932

1,841,907

UNITED STATES PATENT OFFICE

EDWARD J. NEWBAKER, OF WINDBER, PENNSYLVANIA, ASSIGNOR TO BERWIND-WHITE COAL MINING COMPANY, A CORPORATION OF PENNSYLVANIA

APPARATUS FOR MINING

Application filed November 21, 1929. Serial No. 408,710.

My invention relates to the mining of mineral substances and particularly those of a somewhat friable nature, or those which have surfaces of cleavage permitting portions to be removed from the mass in situ, although it may be applied to more amorphous and massive materials.

My invention is particularly adapted to mining coal of various kinds whether bituminous, semi-bituminous, anthracitic or anthracite and is also adapted to mining stones, clays of different kinds and massive but preferably cleavable materials, but I can also mine massive and strong minerals as my invention uses powerful apparatus which can accomplish this, as to mine such minerals only requires more time and energy.

In order to simplify the descriptions herein I will however confine these to the mining of coal in order to avoid the use of unnecessary verbiage.

The invention relates specifically to the means for supporting the cutting tool and for enabling it to be moved from one location to another along the length of the working face and to be swung backward, forward or sidewise, raised or lowered, or tipped in any direction.

A preferred embodiment is shown in the accompanying drawings, in which:—

Fig. 1 is a sectional vertical elevation looking toward the face of a coal seam or other mineral showing a front view of my apparatus in place.

Figs. 2, 3, 4, 5, 6 and 7 are detailed views of various portions of my apparatus. Fig. 8 is a vertical cross sectional elevation taken approximately at right angles to the view of Fig. 1 and presenting a side view of the working portions of my apparatus. Fig. 9 is a detail vertical cross sectional elevation of a portion of the support for my apparatus showing the trunnion which permits various angular positions of the supports where desired or necessary by reason of the conformation of the coal seam or other mineral, or that of the floor or roof.

Fig. 10 are top views of my coal cutting tools showing both the shorter or beginning tool and the longer or finishing tool but it is to be understood that other forms or equivalents may be used.

Fig. 11 is a vertical cross section through a coal seam taken approximately at right angles to the plane of Fig. 1, as indicated by the dot and dash line VIII—VIII, showing the cut of somewhat triangular or taper form produced by my apparatus, parts of which are shown in elevation, and Fig. 12 is a substantially horizontal cross section through the coal showing the cut with a plan view of the working portion of my tool in operative position.

Referring now to the various characters of reference on the drawings: 1 is the roof of the mine which may be of sandstone, slate or other mineral, 2 is the floor which may be of various forms of clay or rock, 3 indicates an irregularity or what is known as a roll in the floor of the mine over which my apparatus can easily operate whereas the heavier and different types of coal cutting machines referred to herein obviously cannot.

4 is a layer of what is known as bone coal on top of the purer coal, this bone coal being an admixture of coal with silicious, argillaceous, or other noncombustible materials which contain much less carbon and hydrocarbons than the coal itself. This bone coal may occur either at the top or elsewhere in the coal seam and in some cases may be absent. 5 is the seam of coal in its original position and 6 indicates the undercut produced therein by the miner using my invention. 7 is the sidewall at the beginning portion of the undercut while 8 is what is known as the sump or beginning portion of the opening or undercut in the coal seam produced by my apparatus.

The line 9 indicates generally the depth of the first cut while the inner line which is substantially parallel thereto indicates the final depth as hereinbefore referred to.

Referring now to the details of my apparatus, 10 are adjustable vertical posts which are adapted to be firmly placed in position having pointed or fishtail ends which are somewhat imbedded in the roof and floors of the mine by adjusting the lower screw ends thus securing them firmly in place. 11 is the

main supporting trolley beam for my apparatus shown as a pipe, this being adjustably supported upon the columns or posts 10 and provided with the collars or closures 12 on the ends thereof. 13 is a trolley mounted on the pipe support 11 adapted to carry the working portions of my apparatus being provided with a wheel 14 which is grooved and adapted to be traversed on the pipe 11. The trolley has a U-formed suspender member 13 provided with a diaphragm 15 in which is the notch 16 adapted to receive any one of the links of the supporting chain 31 so that the height of the cutting apparatus may be varied to suit the work. 17 are sleeves adapted to surround and to be supported by the posts 10 having projecting trunnion sockets 18 provided with recesses 19 and slots 20 to receive the collared ends 30 of the trunnions 29 and the said trunnions respectively. These sleeves 17 may be adjusted in any positions along the posts 10 and are supported thereon by the bolts or pins 24 which are inserted through the holes 27 of the pipe posts 10 as shown. 21 is a staple on the sleeve 17 to receive one end of the chain 22 which is a keeper for the pin 24.

25 is a pin having a chain keeper 23, this pin being inserted through holes 26 in the trunnion socket 18 above the trunnion 29 in order to hold it in operative position.

The lower end of the chain 31 is provided with a hook 32 over which is hooked the upper end of the spring support 33 which again is provided with another hook at its lower end adapted to engage the ring 34 and thereby carry the pick hammer or other tool reciprocating mechanism 35 which is provided with a socket to receive my shorter and longer cutting tools 36 and 37, respectively. Although this support 33 is shown as a spring it may be, if desired, composed of a chain or rod without spring action but under certain conditions the use of a spring provides more flexibility for the positioning and operation of the tools 36 and 37. The pickhammer 35 may be of various forms such as are used for drilling and cutting rock, minerals or other substances, and is preferably operated by air, although it may be actuated electrically or otherwise, and it is also rotatable in the ring 34. It can thus be swung backward, forward or sidewise, can be raised or lowered, and can be tipped in any direction so that its motions are universal.

The construction is such that the tools 36 or 37 do not rotate relatively to the pick hammer 35.

The pickhammer is supplied with air under pressure which is regulated by moving the end portion, to which the handles are attached, in an inward axial direction to supply air, while the air pressure itself will close or tend to close the inlet valve to shut off or regulate the supply. Other means for regulating the air supply may be used as will be readily understood.

Having thus described the apparatus I will now briefly explain its operation:—Although I have shown my mining tool in connection with what is known as a pickhammer, other forms of apparatus capable of producing a powerful reciprocating action may also be used, but I will continue the use of the word "pickhammer" for the sake of simplicity of description.

The apparatus being mounted in position as illustrated in Figs. 1 and 8 and adjacent to the face of the coal as illustrated in Fig. 11, the cross handle, indicated by dotted lines in Fig. 1, are grasped by the operator who is sitting or crouching on the floor of the mine and he begins by placing the apparatus in position, then admitting air to the pickhammer thus reciprocating the tool several hundreds of strokes per minute and so manipulates it as to cut the sump 8 in the face of the coal. He then continues the punching and shearing of the coal as illustrated in Fig. 12 until he has traversed the length of the cut intended and while this is continuing an attendant or helper shovels away the cut coal so that the miner can see and better direct his work. While this is being accomplished the pickhammer is operated so that the inclined point of the tool 36 or 37 penetrates into the massive coal in place and also shears off portions sidewise due to the penerating action of the point and the powerful lateral component of the pressure thereby produced thus forcing the fragments sidewise in a shearing manner into the opening.

The first part of the cut is preferably made with a shorter tool 36 and a second cut is thereafter made with a longer tool 37 and after these cuts are finished, the coal is blasted or otherwise forced down in the usual manner, which is permitted by the cut, after which it is loaded in cars and transported to the coal tipple, whereupon the face of the coal is ready for a repetition of this operation.

Although the cut in the coal seam is illustrated at the bottom thereof, my apparatus will cut it at the top, the sides or elsewhere as will be readily understood. I have made and used many forms of tools as hereinbefore stated but now prefer to use the style illustrated as the combined penetrating and lateral shearing effect of the inclined point portion produces excellent results. The lateral shearing action is due to the inclination of the point portion of the tool which portion also has sufficient side bearing surface so that it does not crush the coal on the side supported by the main body of the seam so that the weaker and unsupported side must yield and be broken from the mass into the opening, with results of efficiently producing the cut desired.

Although I have described and illustrated my invention in considerable detail I do not wish to be limited to the exact and specific details thereof as shown and described, but may use such modifications in, substitutions for, or equivalents thereof, as are embraced within the scope of my invention, or as pointed out in the claims.

I do not herein claim the punching and shearing tool herein described, the same being the subject matter of another application filed July 8, 1930, Serial No. 466,405.

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

1. In a mining apparatus, the combination with a plurality of adjustable posts adapted to be secured between the floor and the roof and a supporting beam extending between the posts, of a sleeve adjustable on each of said posts, a trunnion socket on the sleeve provided with a recess and a slot, a sleeve on said beam, a trunnion on the last named sleeve extending through said slot, and a head on said trunnion extending into said recess.

2. In a mining apparatus, the combination with a plurality of adjustable posts adapted to be secured between the floor and the roof and a supporting beam extending between the posts, of means supporting the beam between said posts, a trolley movable along said beam, a chain supported from said trolley, a spring supported from said chain, and a tool carrier supported from said spring.

3. In a mining apparatus, the combination with a plurality of adjustable posts adapted to be secured between the floor and the roof and a supporting beam extending between the posts, of means supporting the beam between said posts, a trolley movable along said beam, a U-shaped suspension member on said trolley, a notched diaphragm carried by said member, a chain a link of which is supportable in the notch of the diaphragm, a tool carrier, and means to support the tool carrier from said chain.

In witness whereof I hereunto affix my signature.

EDWARD J. NEWBAKER.