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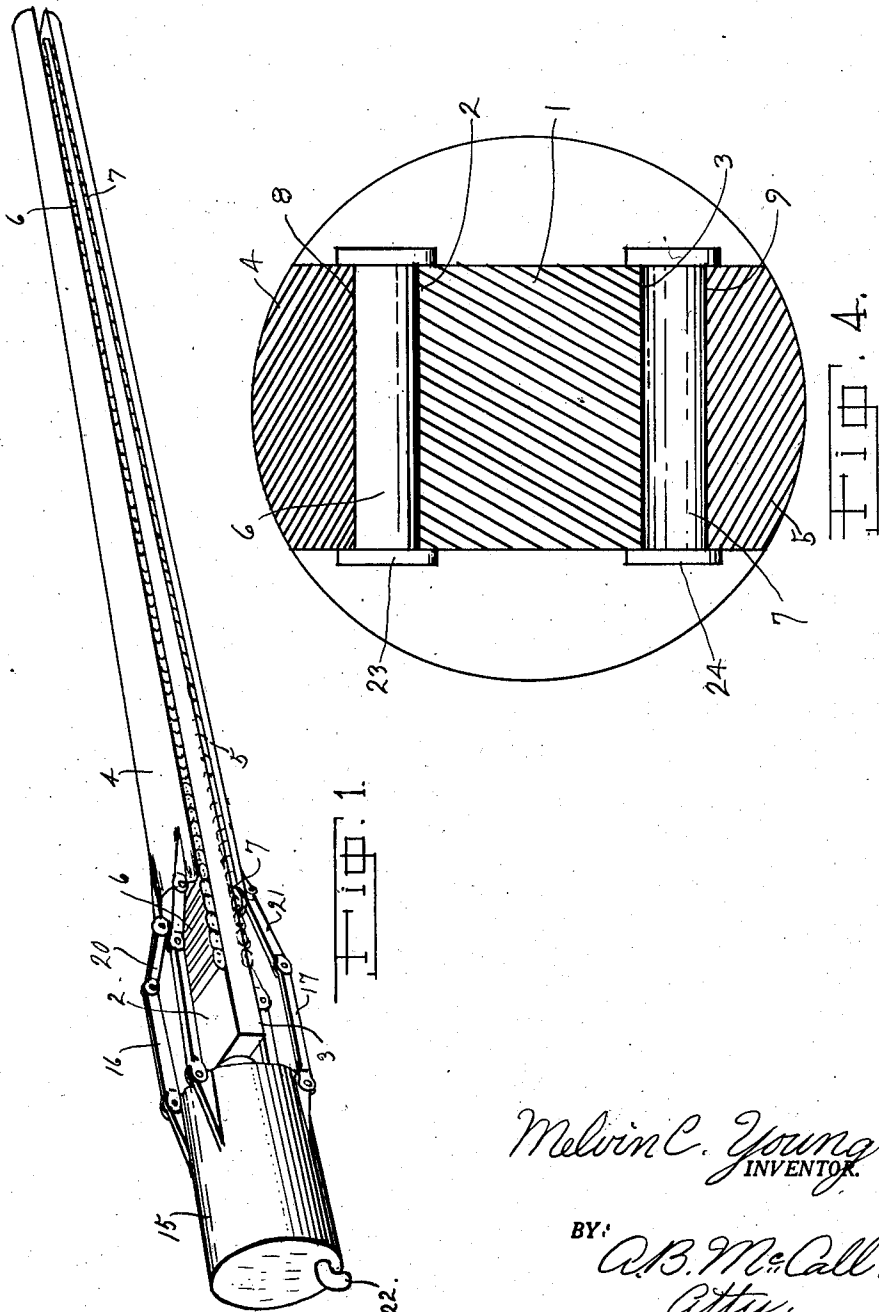
M. C. YOUNG

2,385,753

HYDRAULIC ROLLER BEARING DIRECTIONAL PRESSURE WEDGE

Filed Nov. 3, 1943

2 Sheets-Sheet 1



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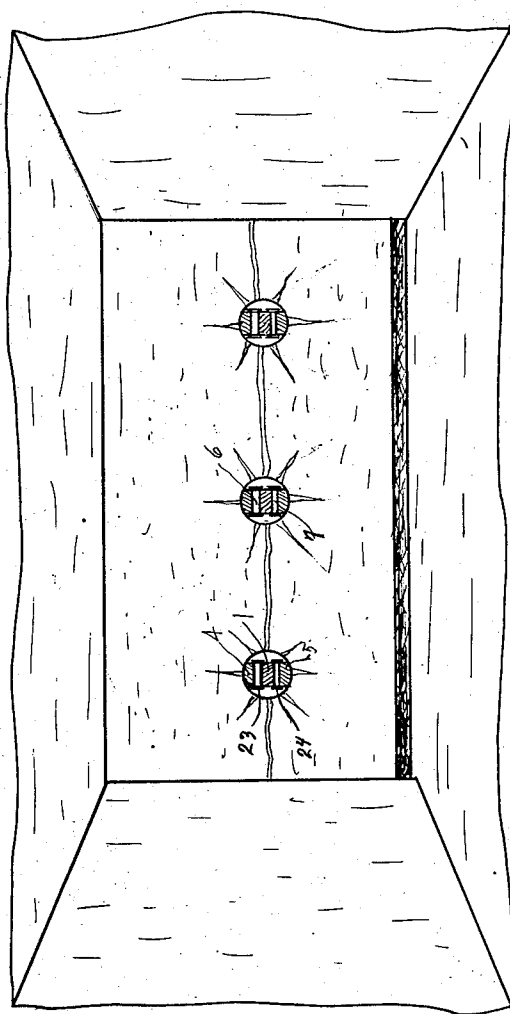
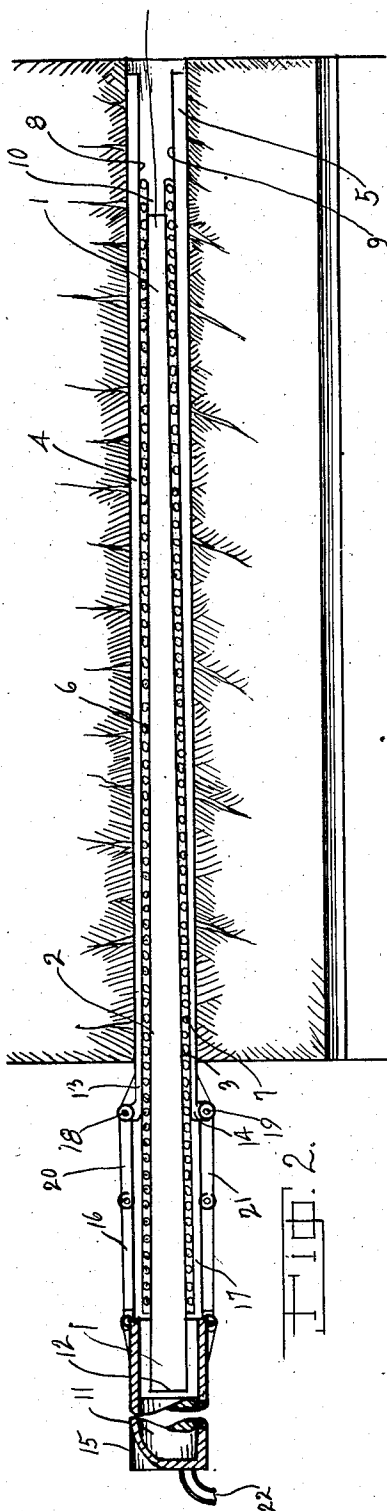
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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HYDRAULIC ROLLER-BEARING DIRECTIONAL PRESSURE WEDGE

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Application November 3, 1943, Serial No. 508,823

1 Claim. (Cl. 262—12)

My invention relates to wedges and more especially to mechanical wedges; an object being to provide in a simple and economical manner a means for exerting such directional stresses as may be needed for forcing coal and the like out of its original bed in a coal vein without the necessity for using dangerous explosives, as happens to be the means by which this work is achieved now.

A further purpose of my invention is to provide a mechanical wedge for mining coal wherein the operation of the same will involve the use of a hydraulic power and an equipment capable of being easily and conveniently carried and manipulated by one man.

A particular purpose of my invention is to provide a hydraulic pressure wedge made to permit selective variations in the directions of its pressure applications and capable of easily and conveniently breaking down coal from its original position of deposit in a coal vein without the need of utilizing the force of any dangerous explosives.

I attain the objects of my invention by the device described in this specification, recited in the claim and pictured in the drawings.

Fig. 1 is a perspective view of the wedge bar.

Fig. 2 is a side view of the same, shown with the roller bearings between the wedge members and pressure bars exposed to view. This figure also shows a vertical section of a portion of a coal wall that is under-cut ready to be broken down by my wedge.

Figure 3 is a perspective view of the front face of a mine, showing the coal face undercut at the floor level, and drilled to receive the wedge bars before breaking down the coal.

Fig. 4 is a sectional view of my wedge bar as when in place in a drill hole for receiving it.

I shall now set forth the salient features of novelty in my invention as I describe the several details of operating construction to be found in this device; while in connection with this description I shall point out the novel advantages to come from using the same.

First of all it may be said that a machine that will effectively reduce the need for using explosive powder and dynamite in mining coal will very materially cut down the danger to miners as well as the extensive expense involved in the purchase of such explosives.

Thus in my efforts to develop a practical, economical and efficient machine for the above stated purposes I am providing a hydraulic pressure wedge wherein an elongated pressure wedge mem-

ber 1 is made with a comparatively slim taper on opposed sides 2 and 3 thereof and is adapted to be forced into the space between pressure bars 4 and 5 respectively, providing each with a line of wedge rollers 6 and 7 and each respectively carried by the inner faces 8 and 9 of pressure bars 4 and 5; thus to make easier and more effective the wedging movement of wedge 1 back into the space 10 between rollers 6 and 7.

A hydraulic ram 11 which is adapted to exert a driving pressure against end 12 of wedge 1 is carried by the outer ends 13 and 14 of pressure bars 4 and 5 respectively; while the hydraulic pressure cylinder 15 from which pressure is applied to ram 11 is operatively connected with bars 4 and 5 through a pair of opposed pressure arms 16 and 17 pivotally connected with bars 4 and 5 with a hinge pin 18 and 19 respectively.

Arms 16 and 17 establish their connection with pressure cylinder 15 through a pair of connecting arms 20 and 21 adapted to hold and stabilize the operation of applying hydraulic pressure wedge member 1 when forcing a head of coal loose.

The hydraulic pressure fluid is admitted to and released from cylinder 15 through port 22, when my machine is in operation, while the roller bearings 6 and 7 are operatively contacting the inner faces of pressure bars 4 and 5 by a series of connected bearing links 23 and 24.

These bearing links 23 and 24 each flank the sides of pressure bars 4 and 5 respectively as a means of operative support for roller bearings 6 and 7 when the pressure wedge member 1 is being forced into the space between bars 4 and 5.

It is obvious that in the construction of my invention it will be both possible and practical when using this pressure wedge within the drilled hole within the coal wall, to turn the pressure wedge and pressure bars in any desired position to be able to throw exerted hydraulic wedge pressure in any desired direction.

It will also be obvious that where the occasion may require more than one under-cut channel may be formed in the coal wall with the pressure wedge of my invention inserted into the drill hole for applying a wedge pressure by hydraulic force in order to break down the portion of the coal wall below the under-cut channel within which the hydraulic pressure wedge is operating.

In fact there are a number of substantial and practical ways in which my hydraulic pressure wedge may be applied with most favorable, economical and convenient means of operation and

yet with all such purposes achieved without the use of or need of any dangerous and expensive explosives for mining the coal.

Having thus described the nature of my invention what I claim is:

A pressure breaker for coal mines and adapted to be used in the coal face of a mine, with drill holes for receiving the wedge and with undercuts below the holes in such wall, and comprising, a pair of opposed pressure bars, a tapered smooth 10 pressure wedge between said bars, a plurality of flanged roller bearings, operatively spaced along the approximate length of said wedge on opposed sides thereof and between it and the two pressure bars respectively, a hydraulic plunger unit 15

including a cylinder, a hydraulic fluid intake therefor, a plunger piston adapted to operatively exert an abutting pressure contact with the outer end of said pressure wedge, jointed opposed 5 pairs of supporting arms establishing operative connection between said hydraulic plunger cylinder and said pressure bars and wedge, said flanges of said roller bearings adapted to guide said bars and pressure wedge into an efficient 10 operating relation when the pressure wedge receives an application of hydraulic plunger pressure against its outer end for breaking down coal and the like.

MELVIN C. YOUNG.