Dec. 29, 1936. H. F. DIETZ 2,066,175

MINING JACK

Filed Aug. 19, 1935

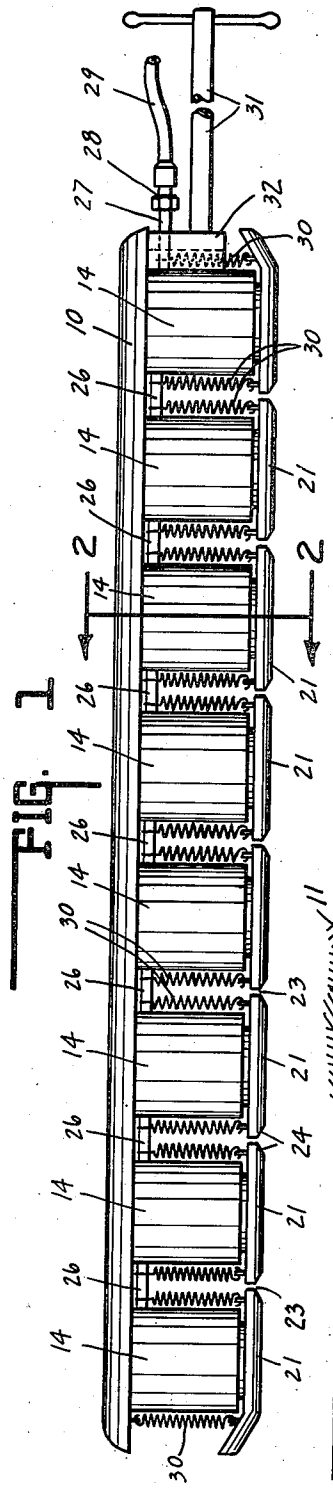


FIG. 1

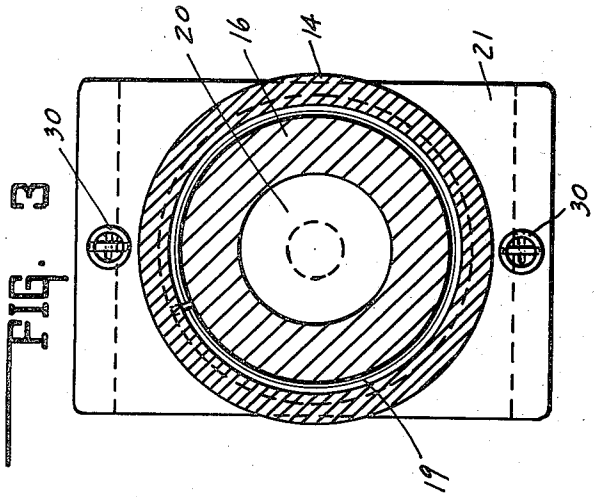


FIG. 3

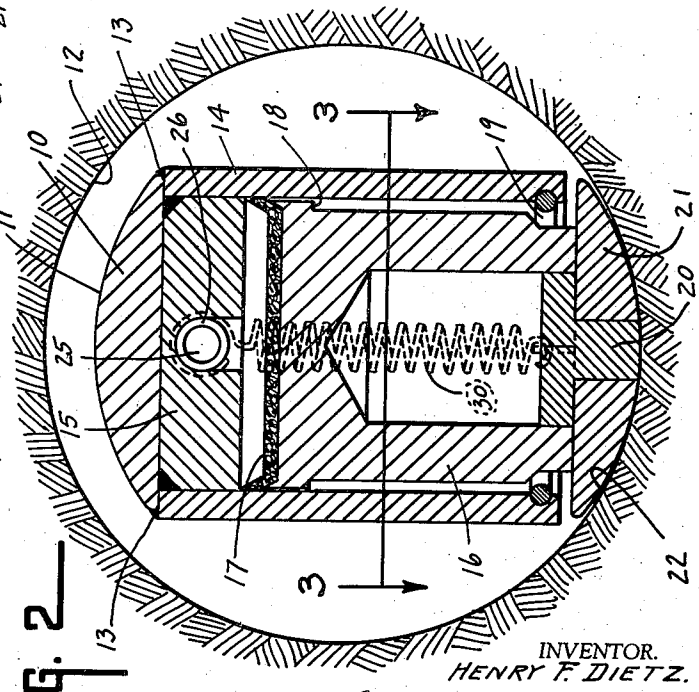


FIG. 2

INVENTOR.
HENRY F. DIETZ.

BY Lockwood Goldsmith & Galt

ATTORNEYS.

Patented Dec. 29, 1936 2,066,175

UNITED STATES PATENT OFFICE

2,066,175

MINING JACK

Henry F. Dietz, Indianapolis, Ind., assignor to Morton L. Gould, Indianapolis, Ind.

Application August 19, 1935, Serial No. 36,776

2 Claims. (Cl. 262—12)

This invention relates to a mining jack which is particularly useful in coal mining, but may be used equally well in mining or quarrying other minerals.

One object of the invention is to replace the dangerous use of explosives with a safe and sane apparatus which accomplishes the same result with no danger to the workers from premature or delayed explosions or from the mishandling of the explosive.

Another object of the invention is to provide a hydraulic device for the purpose which may be easily and cheaply constructed and which is simple and convenient to operate.

Another object of the invention is to provide a device in which the pressure for breaking out the coal or other mineral is applied evenly over the full length of the drill hole in which the device is inserted, and in which the pressure may be applied in any desired direction.

The features of the invention by which these and other objects are attained will be apparent from the accompanying specifications and drawing in which a preferred form thereof is described by way of illustration.

The full nature of the invention will be understood from the accompanying drawing and the following description and claims:

Fig. 1 is an elevational view of the complete structure in its present preferred form. Fig. 2 is a sectional view thereof taken on the line 2—2 of Fig. 1 and including the outline of a drill hole in which the apparatus is to be used. Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2.

The device as illustrated includes a base piece 10 elongated in form and having a bearing surface 11 in the form of a portion of a cylinder of substantially the same diameter as the inner surface 12 of the drill hole in which the device is to be used. The bearing surface 11 thus conforms substantially to the shape of the drill hole and distributes the pressure evenly over its inner surface.

Attached to the base piece 10, as by welding 13, there is a plurality of hydraulic cylinders 14, each having a cylinder head 15 secured therein. Each cylinder 14 is provided with a piston 16 having a cup leather 17 or other packing means. The pistons 16 are provided with shoulders 18 adapted to encounter snap rings 19 to limit their outward travel. The snap rings 19 are placed in suitable grooves in the inner surfaces of the cylinders 14 and are easily removed to permit removal of the pistons for cleaning or other purposes.

Each piston has secured in the outer end thereof a centering pin 20 to which there is attached a pressure plate 21. The pressure plates 21 are preferably substantially rectangular in plan and have their bearing surfaces 22 in the form of portions of a cylinder of the same or slightly smaller diameter than that of the drill hole 12. The plates 21 are aligned along the length of the device with only a small space 23 between adjacent plates. They thus bear against the side of the drill hole throughout substantially the entire length of the device and distribute a uniform pressure thereon. The corners of the plates are chamfered as shown at 24 to facilitate entry into the drill hole.

Each of the cylinder heads 15 is provided with an internal passage 25 communicating with the interior of the cylinder and said passages in adjacent heads are connected as by pipe nipples 26 to provide a continuous passage. The inner end of said passage connects to a pipe 27 to which there is connected by means of a fitting 28 a flexible conduit 29 which in turn is connected to a suitable pump, not shown, which may supply oil, water, or other suitable fluid under pressure.

Each pressure plate 21 has secured thereto a pair of tension springs 30 attached at their opposite ends to the pipe nipples 26. These springs serve to draw the pressure plates toward the back piece 10 to facilitate the withdrawal of the apparatus from the drill holes for any reason.

At one end of the apparatus a handle 31 is secured by means of a block 32 preferably welded to the back piece 10 and to the adjacent cylinder. The handle is of sufficient length to extend outside of the drill hole and provides for easy manipulation of the apparatus therein.

In the use of the apparatus, the drill holes are placed in the usual manner as in the use of explosives. Their depth is ordinarily about twice the length of the base piece 10. The apparatus is then inserted in the hole with the pressure plates on the side of the hole toward which the break is to be made. If the break is to be downward, the pressure plates are placed at the bottom as shown in Fig. 2. If the break is to be in an angular direction, the apparatus is turned by the handle 31 until the pressure plates are aimed in the proper direction. Hydraulic pressure is then applied through the conduit 29 forcing the base piece and pressure plates apart against the walls of the drill hole. Because of the proper shaping of the bearing surfaces, the plates and base piece apply a uniform pressure throughout the length of the de-

vice and do not expend energy uselessly in penetrating the coal. This uniform force applied with a high hydraulic pressure is the equal in every way of the force of an explosive in breaking out the coal and is not attended with the dangers inherent in the use of explosives.

If for any reason it is desired to withdraw the device before a complete break has been made, it is only necessary to release the hydraulic pressure. The springs **30** then draw the pressure plates and base piece together, no matter how tightly they have been pressed against the wall of the drill hole. The apparatus may then be easily withdrawn by the handle **31**.

While the foregoing specification describes a preferred form of the invention, the details thereof may be varied between wide limits without departing from the scope of the invention as defined by the appended claims.

The invention claimed is:

1. A mining jack adapted to enter a drill hole and to expand the same by hydraulic pressure, including an elongated base piece adapted to bear against one side of said drill hole, a plurality of spaced cylinders secured to said base piece, a piston in each of said cylinders, a pressure plate secured to each piston and adapted to press against the opposite side of the drill hole, said plates overhanging their respective cylinders in the longitudinal direction, connections by means of which hydraulic pressure may be applied to each of said cylinders, and springs tending to draw the pressure plates toward the base piece, said springs being secured to the overhanging portions of the pressure plates and lying in the spaces between the cylinders.

2. A mining jack adapted to enter a drill hole and to expand the same by hydraulic pressure, including an elongated base piece adapted to bear against one side of said drill hole and having its bearing surface shaped to conform substantially to the inner surface of said hole, a plurality of spaced cylinders secured to said base piece, a piston in each of said cylinders, a pressure plate secured to each piston and adapted to bear against the opposite side of said drill hole, said plates overhanging their respective pistons in the longitudinal direction and being shaped to provide a substantially continuous bearing surface substantially conforming to the inner surface of said drill hole, connections by means of which hydraulic pressure may be applied to each of said cylinders, and springs tending to draw the pressure plates toward the base piece, said springs being secured to the overhanging portions of the pressure plates and lying in the spaces between the cylinders.

HENRY F. DIETZ.