

Nov. 22, 1938.

F. A. FOWLER
MOUNTING

2,137,669

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Fig. 1.

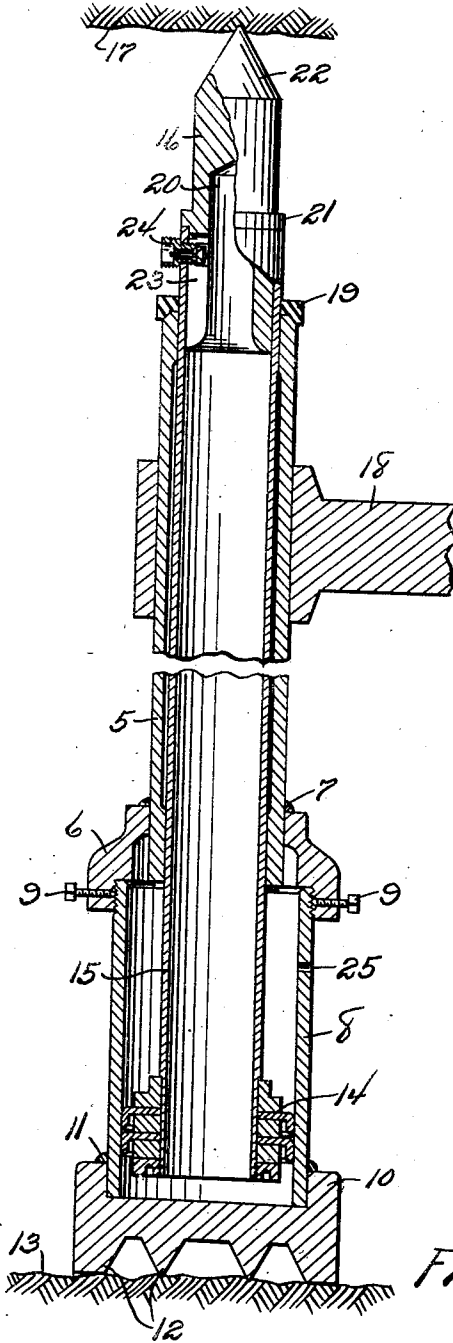


Fig. 2.

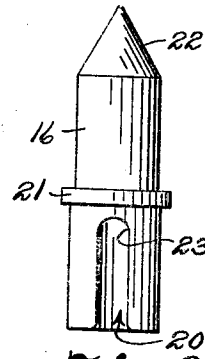
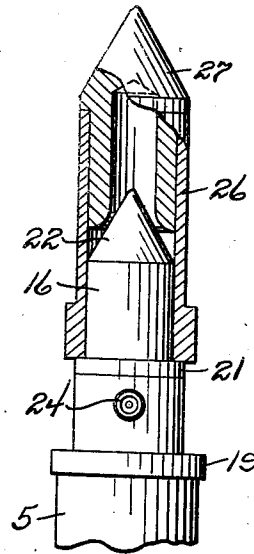


Fig. 3.



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UNITED STATES PATENT OFFICE

2,137,669

MOUNTING

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4 Claims. (Cl. 255-53)

My invention relates to mountings and more particularly to pneumatic drill mountings.

Pneumatic drills, particularly rock drills, are usually supported within the drift between the floor and ceiling thereof by means of a mounting. The mounting usually comprises a column or cylinder equipped with a piston having a piston and piston rod. One end of the piston rod is fashioned with means for holding one end of the mounting in engagement with the ceiling of the drift, while the oppositely disposed end of the cylinder is fashioned for engagement with the floor of the drift. Compressed air is usually introduced into the cylinder to cause relative movement of the piston and cylinder to effect a clamping of the mounting between the floor and ceiling. Mounted on the cylinder, intermediate of the ends thereof, is a work arm adapted to support a drill in operating position. In the operation of the drill, the same is moved on the work arm and away from the cylinder thereby greatly increasing the torque on the cylinder. This increase in the torque results in a twisting or turning of the cylinder and as a consequence the drill is moved away from the work and rendered useless. When this undesirable result occurs considerable time and labor is required to reposition the mounting and drill for further operation. Examples of drill structures of the aforementioned character are disclosed in the United States Patents Nos. 1,418,336 and 1,954,957.

Due to the limited space within the drift, it is necessary to construct the drill mounting of the smallest size feasible, particularly the cylinder or supporting column on which the work arm is mounted. As a consequence, so far as I have been able to ascertain and with reference to the above noted patents, the cylinders or columns are of a relatively small diameter whereby only a minimum amount of floor area is engaged by the head of the cylinder and which amount is not sufficient to appreciably counteract a torque transmitted to the cylinder by the drill through the medium of the work arm.

To counteract the effect of the torque I have discovered that it is essential to increase the floor engaging surface of the cylinder without increasing the normal or standard diameter of the column on which the work arm is mounted.

It is therefore one of the principal objects of my invention to provide a mounting equipped with means for engaging the wall of a drift and so constructed and arranged to counteract torque and twist transmitted to the mounting by the action of a drill and thereby maintain the mount-

ing in fixed position between the walls of the drift.

Another object of my invention is to provide a mounting of the above described character capable of adjustment for supporting a drill within narrow as well as relatively wide drifts.

A further object of my invention is to provide a mounting of the above described character which is simple in construction, efficient in operation, easy of attachment, durable in use and economical in manufacture.

Other objects and advantages will be apparent from the following description, appended claims and annexed drawing.

Referring to the drawing wherein like reference characters designate like parts throughout the several views:

Fig. 1 is a vertical section of my invention.

Fig. 2 is a side elevation of the ceiling engaging member.

Fig. 3 is a side elevation, partly in section, illustrating a pair of the ceiling engaging members connected together and adapted for use in connection with wide drifts.

In practicing my invention I provide a casing of hollow construction having secured to the lower end thereof a reducing coupling 6, said coupling being secured to said casing by means of welding as at 7. The enlarged section of said coupling is internally threaded and receives therein the upper end of a cylinder 8. Set screws 9 serve to maintain the cylinder in locked relation with the coupling.

The lower end of the cylinder 8 is secured within a recess of a cylinder head 10 and is welded therein as at 11. The lower face of the head 10 is fastened with a plurality of teeth 12 adapted to engage the floor 13 of a drift.

Within the cylinder 8 there is slidably mounted a piston 14 secured about the lower end of a piston rod 15 fashioned with a longitudinally extending bore throughout the length thereof. The piston rod 15 extends upwardly through the casing 5 and has secured on the upper end thereof a ceiling engaging member 16 adapted to engage the ceiling 17 of the drift.

A work arm 18 is rigidly secured to the casing 5 between the upper end thereof and the coupling 6 and adjustably supports thereon a drill (not shown) for operation within the drift. The upper end of the casing 5 has secured thereon a rubber dirt shield 19 centrally apertured for receiving the end of the piston rod 15.

The ceiling engaging member 16 comprises an elongated sleeve formed with a central aperture

20 communicating with the interior of the piston rod 15. Said sleeve is fashioned on the outer periphery thereof with a circumferentially extending shoulder 21 engaging the upper edge of the rod 15 whereby the lower portion of said sleeve is maintained within the bore of the rod 15. The upper end of the sleeve is tapered as at 22 for engagement with the ceiling 17. The lower portion of the sleeve subjacent the shoulder 21 is formed with a slot 23 communicating with the aperture 20 and which accommodates therein the inner end of a valve 24 threadedly carried by the rod 15 adjacent the upper end thereof. The outer end of the valve is threaded to receive an air connection whereby air may be introduced into the cylinder below the piston 14 through the bore of the rod 15 and aperture 20 of the sleeve. The upper section of the cylinder 8 is provided with an air vent 25 to prevent compression within the cylinder above the piston 14.

Attention is directed to the fact that the cylinder is of a greater diameter than the casing, and likewise the head 10 is of a greater diameter than the diameter of the cylinder. Furthermore, the outside diameter of the rod 15 is of such a diameter relative to the inside diameter of the casing as to provide an operating fit.

In use, due to the greatly increased diameter of the cylinder of the casing 5, the head engages an area of a floor of a greater diameter than would be the case if the cylinder was of a like diameter with the casing, thereby counteracting the torque transmitted to the casing from the arm and maintaining the mounting in fixed position between the ceiling and floor of the drift. In operation, air introduced into the cylinder, through the medium of the bore in the rod 15, aperture 20 in the sleeve and valve 24, causes relative movement of the piston and cylinder and effects a clamping of the mounting between the ceiling and bottom of the drift.

In instances where it is desired to use the mounting in wide drifts, an auxiliary sleeve 26 is employed and inserted over the member 16 and a supplemental member 27 inserted in said sleeve to increase the length of the member 16, as clearly illustrated in Figure 3 of the drawing.

From the foregoing it will be apparent that the enlarged cylinder permits a greater force to be applied to the piston as well as providing a larger base or supporting member. For example, a 3" piston exerts 720 pounds pressure on the piston rod, a 5" piston 1960 pounds, a 6" piston 2800 pounds, an 8" piston 4400 pounds when supplied with a liquid under 100 pounds pressure due to the enlarged area of the face of the piston. Tests seem to prove that a 6" piston member is required to successfully meet and overcome the torque and twisting effect based on the supporting column by the conventional rock drill machines now in use, while being used out at the end of the supporting arm and opposite the supporting column. This being the case, the fact is obvious that a column with an internal diameter of 6 inches would be too heavy and large to be of use in the mining industry. The conventional size drill support has an outside diameter of approximately 3½". Thus by enlarging the cylinder section or member of the column I am enabled to obtain my new and advantageous result.

What I claim is:

1. A drill mounting comprising a piston rod

casing, a drill supporting arm secured on said casing and adapted to adjustably accommodate a drill thereon, a cylinder secured to one end of said casing and provided with a head for engagement with a wall of a drift, a piston rod operable in said casing, a piston operable in said cylinder and connected about one end of said rod, and means carried by the other end of said rod for engaging the opposite wall of the drift, said cylinder of a larger diameter than said casing whereby as a consequence said head engages an area of said first mentioned wall of a greater diameter than said casing to counteract torque and twist transmitted to said casing from said arm to maintain the mounting in fixed position between said walls.

2. A drill mounting comprising a piston rod casing, a drill supporting arm secured on said casing and adapted to adjustably accommodate a drill thereon, a cylinder secured to one end of said casing and provided with a head for engagement with a wall of a drift, a piston rod operable in said casing, a piston operable in said cylinder and connected about one end of said rod, means carried by the other end of said rod for engaging the opposite wall of the drift, said cylinder of a larger diameter than said casing whereby as a consequence said head engages an area of said first mentioned wall of a greater diameter than said casing to counteract torque and twist transmitted to said casing from said arm to maintain the mounting in fixed position between said walls, and teeth carried by said head for engaging said first mentioned wall whereby to prevent relative movement therebetween.

3. A drill mounting comprising a piston rod casing, a drill supporting arm secured on said casing and adapted to adjustably accommodate a drill thereon, a cylinder secured to one end of said casing and provided with a head for engagement with a wall of a drift, a piston rod operable in said casing, a piston operable in said cylinder and connected about one end of said rod, and means carried by the other end of said rod for engaging the opposite wall of the drift, said cylinder of a larger diameter than said casing for increasing pressure on said piston rod whereby as a consequence greatly increased force is applied to said casing to counteract torque and twist transmitted to said casing from said arm to maintain the mounting in a fixed position between said walls.

4. A drill mounting comprising a piston rod casing, a drill supporting arm secured on said casing and adapted to adjustably accommodate a drill thereon, a cylinder secured to one end of said casing and provided with a head for engagement with a wall of a drift, a piston rod operable in said casing, a piston operable in said cylinder and connected about one end of said rod, means carried by the other end of said rod for engaging the opposite wall of the drift, said cylinder of a larger diameter than said casing for increasing pressure on said piston rod whereby as a consequence greatly increased force is applied to said casing to counteract torque and twist transmitted to said casing from said arm to maintain the mounting in a fixed position between said walls, and teeth carried by said head for engaging said first mentioned wall whereby to prevent relative movement therebetween.

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