Aug. 24, 1926. 1,596,873

G. H. GILMAN

DRILLING MACHINE

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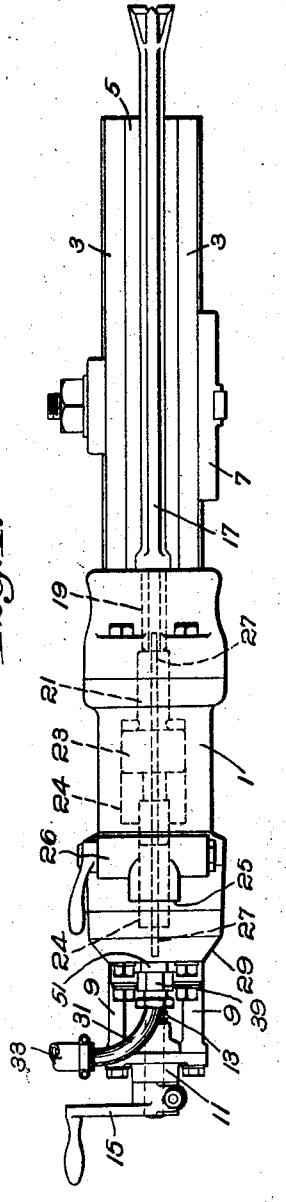


Fig. 1.

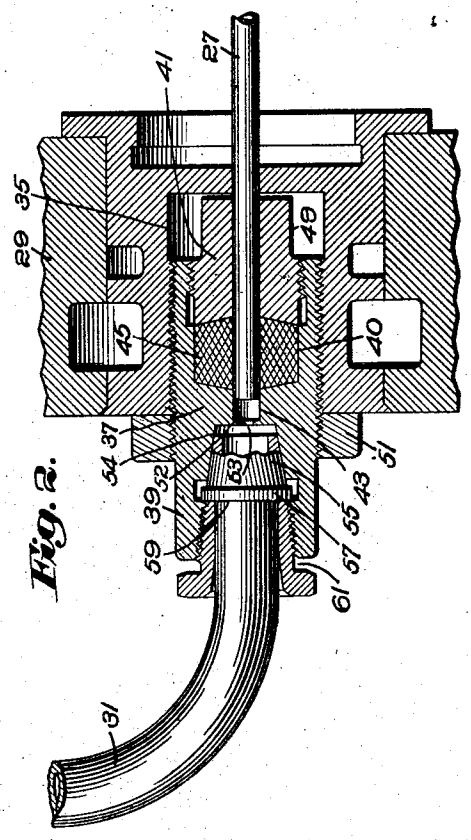


Fig. 2.

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UNITED STATES PATENT OFFICE.

GEORGE H. GILMAN, OF BELMONT, MASSACHUSETTS.

DRILLING MACHINE.

Application filed March 23, 1922. Serial No. 546,008.

My invention relates to impact machines and particularly to rock drills.

My invention will be best understood from the following description when read in the light of the accompanying drawings of one specific embodiment of my invention selected for illustrative purposes, while the scope of my invention will be more particularly pointed out in the appended claims.

In the drawings:—

Fig. 1 is a plan view of a mounted hammer rock drill; and

Fig. 2 is a longitudinal section of the rear end of the machine illustrating a detail on an enlarged scale.

I will now describe the specific embodiment of my invention selected for illustration by reference to the drawing in which the drilling engine is represented at 1 and is mounted to slide on the ways 3 of a suitable cradle 5, which cradle is secured by means of the trunnion mounting indicated at 7 to a mine column or other suitable means of support. Projecting rearwardly from the cradle are a pair of rods 9 which support the thrust bearing 11 for the feed screw 13. As will be understood by those skilled in the art, the feed screw cooperates with a nut on the drilling engine and is turned by means of the handle crank 15 to cause the engine to travel back and forth along the ways.

As the mounting for the drilling engine above indicated represents a common construction and one which does not specifically form part of my present invention, the same will not be further described.

At its forward end the drilling engine carries a hollow drill steel 17, the shank 19 of which is carried in a chuck at the front end of the drilling engine and as illustrated is adapted to be impacted by the hammer bar 21 of the hammer piston 23, which hammer piston is mounted for reciprocation in the piston chamber 24 of the drilling engine. Compressed air is supplied through the connection 25 and is admitted by the throttle 26 to the engine to cause the hammer to reciprocate, all of which will be understood by those skilled in the art without further description.

As is common in devices of this kind I provide a tube 27 for cleansing fluid such as water, which tube herein extends from the rear head 29 of the drilling engine through the piston and terminates within the shank of the drill steel.

For supplying the tube 27 with cleansing fluid I have shown mounted on the rearward end of the drilling engine a swivelled angle connection 31 which, as shown, makes a right angle bend and carries at its outer end the hose 33. The hose is supplied with cleansing fluid, for example water under pressure. It will be noticed by this construction that the hose 33 may be placed on either side of the mounting, which is of importance when drilling close to the wall of a drift or in a similar situation, and likewise that said hose will be held by the angle connection from interference with the handle crank 15 and from interference with the cradle and its associated parts. It will be appreciated that the hose 33 and especially when it is supplied with fluid under pressure is stiff and tends to bend on large radii and that heretofore in prior constructions much difficulty has been experienced in readily disposing of the hose to prevent its interference with the operation and positioning of the machine. If desired the connection 25 may carry an angle connection similar to the angle connection 31.

For mounting the tube 27 and the angle connection 31 for supplying the tube I have shown in the rear head a rearwardly opening socket 35, which at its rearward end is screw threaded for engagement with the exterior screw threaded member 37. The member 37 at its rearward end herein is formed to provide a portion 39 for engagement by a wrench and at its forward end is shown as provided with a forwardly opening socket 40. The socket 40 is provided at its forward portion with screw threads, which screw threads receive the exterior threads of a plug 41. The tube 27 as shown extends through the plug into a small diameter portion 43 of the member 37. At the bottom of the socket 40 is shown a bushing 45 of suitable material, preferably rubber, which when the tube is inserted may, by means of the plug 41, be compressed about

the tube and thereby secure the tube to the member 37. The plug 41 shown as provided with a portion 49 for engagement by a wrench and the parts are so proportioned that provision is made for the set in the rubber packing 49, which set takes place after the rubber has been in continued use. Herein the member 37 is securely held from unintentional turning in the socket 35 by means of the lock nut 51.

It will be appreciated that the member 37 as described forms a mounting for the water tube, which mounting together with the tube may be withdrawn rearwardly from the rear head. Also, it will be noticed that the tube is adjustable relatively to the mounting and that the mounting is adjustable relative to the rear head. These adjustments may be availed of to affect the position of the tube 27 relatively to the drill bit. By making the securing means for the tube adjustable the same length of tube may be employed in different machines in which the distance from the rear head to the rearward end of the drill shank or other part receiving the front end of the tube varies. In rock drill operation the tube must frequently be replaced and ordinarily this is a troublesome operation to make underground and one which makes it necessary for the drill runner to keep on hand different lengths of tubes to suit different machines which he may be operating. With the mounting described not only may the replacement be readily effected but it is unnecessary to take underground a supply of tubes of various lengths.

I have shown in the illustrative embodiment of my invention the small diameter portion 43 of the internal conduit of the member 37 as terminating short of the rearward end thereof to form a shoulder 52 and as connected with the angle connection 31 by a smaller passage 53. This shoulder may be included and especially where tubes of such length are employed or other reasons make it advisable to have a gauge for positioning the tube in the member 37 and in which case the end of the tube may abut the shoulder 52. When the shoulder is omitted the rearward end of the tube may, if necessary, project into the conduit of the angle connection.

For supporting the angle connection, the rearward portion of the member 37 is shown as provided with a rearwardly opening socket 39, the inner portion 54 of which is tapered and the outer portion screw threaded. The angle connection 31 is provided with a tapered end 55 which fits the socket 53, and with a flange 57, the latter affording a shoulder 59. The shoulder 59 is engaged by the thimble 61, which is screw threaded into the rearwardly opening socket of the member 37 and by engagement with the shoulder 59 holds the portion 57 of the angle connection in the tapered socket portion 53. As will be appreciated this construction permits swivelling of the angle connection relatively to the rear head.

Although I have described for purposes of illustration one specific embodiment of my invention it is to be understood that within the scope of my invention wide deviations may be made therefrom without departing from the spirit of my invention.

Claims:—

1. In a rock drill, a cylinder having a rear head, a piston in said cylinder, a hollow drill steel axially aligned with said piston, a tube for conducting cleansing fluid from said rear head and through said piston to said steel, a mounting in said rear head for said tube, said mounting and tube as a unit being removable rearwardly from said rear head, and means for adjusting said mounting axially of said cylinder for adjusting the relation of the forward end of said tube relatively to said drill steel.

2. In a rock drill, a cylinder having a rear head, a piston in said cylinder, a hollow drill steel axially aligned with said piston, a tube for conducting cleansing fluid from said rear head and through said piston to said steel, a mounting in said rear head for said tube, said mounting and tube as a unit being removable rearwardly from said rear head, means for securing said tube to said mounting, and means for adjusting said mounting axially of said cylinder for adjusting the relation of the forward end of said tube relatively to said drill steel.

3. In a rock drill, a cylinder having a rear head, a piston in said cylinder, a hollow drill steel axially aligned with said piston, a tube for conducting cleansing fluid from said rear head and through said piston to said steel, a mounting in said rear head for said tube, said mounting and tube as a unit being removable rearwardly from said rear head, means for adjustably securing said tube to said mounting, and means for adjusting said mounting axially of said cylinder.

4. In a rock drill, a cylinder having a rear head, a piston in said cylinder, a hollow drill steel axially aligned with said piston, a tube for conducting cleansing fluid from said rear head and through said piston to said steel, a mounting in said rear head for said tube, said mounting and tube as a unit being removable rearwardly from said rear head, a swivelled hose connection carried by said mounting, and means for independently securing said tube and said hose connection to said mounting.

5. In a rock drill, a cylinder having a rear head, a piston in said cylinder, a hollow drill steel axially aligned with said piston, a tube for conducting cleansing fluid from

said rear head and through said piston to said steel, a mounting in said rear head for said tube, said mounting and tube as a unit being removable rearwardly from said rear head, a swivelled hose connection carried by said mounting, and means for adjusting said mounting axially of said cylinder.

6. In a rock drill, a cylinder having a rear head, a piston in said cylinder, a hollow drill steel axially aligned with said piston, a tube for conducting cleansing fluid from said rear head and through said piston to said steel, a mounting in said rear head for said tube, said mounting and tube as a unit being removable rearwardly from said rear head, said mounting having means for securing said tube thereto, a swivelled hose connection carried by said mounting, and means separate from said tube securing means for securing said hose connection to said mounting.

7. In a rock drill, a cylinder having a rear head, a piston in said cylinder, a hollow drill steel axially aligned with said piston, a tube for conducting cleansing fluid from said rear head through said piston to said steel, a mounting in said rear head for said tube, said mounting and tube as a unit being removable rearwardly from said rear head, said mounting having means for securing said tube thereto, means for adjusting said mounting axially of said cylinder, and a swivelled hose connection carried by said mounting.

8. In a rock drill, a cylinder having a rear head, a piston in said cylinder, a hollow drill steel axially aligned with said piston, a tube for conducting cleansing fluid from said rear head through said piston to said steel, a mounting in said rear head for said tube, said mounting and tube as a unit being removable rearwardly from said rear head, said mounting having means for adjustably securing said tube thereto, means for adjusting said mounting axially of said cylinder, and a swivelled hose connection carried by said mounting.

9. In a rock drill, a cylinder having a rear head, a rearwardly opening socket in said rear head, a mounting for securing a cleansing fluid tube to said rear head and for adjusting said tube axially of said cylinder by rotation of said mounting, said mounting including a member screw threaded into said socket and having a wrench receiving portion projecting rearwardly of said rear head, a forwardly opening socket in said member, a plug screw threaded into said socket of said member, tube extending through said plug into said member and clamped to said member by said plug.

10. In a rock drill, a cylinder having a rear head, a cleansing fluid tube, a rearwardly opening interiorly threaded socket in said head, a mounting for said tube for securing it to said rear head and for adjusting said tube axially of said cylinder by rotating said mounting, said mounting including an exteriorly threaded member for reception by said socket, said member having a wrench receiving portion at its rearward end, a forwardly opening socket in said member, a tube extending into said last named socket, a packing in said last named socket and surrounding said tube, a plug screw threaded into said last named socket for compressing said packing, a rearwardly opening socket in said member in communication with the forwardly opening socket thereof, and a swivel hose connection carried in the last named socket.

11. A rock drill having in combination, a cylinder, a piston in said cylinder, a hollow drill steel, a cleansing fluid tube, a rear cylinder head, a mounting for securing said tube to said rear head, said mounting and tube being removable as a unit rearwardly through said rear head and by rotation thereof relatively to said rear head adjusting said tube axially of said cylinder, said mounting including a member having a wrench engaging portion at its rearward end, said member being exteriorly screw threaded and being received in an interiorly screw threaded rearwardly opening socket in said rear head, an axial passage extending through said member from end to end, a swivelled hose connection received in the rearward end of said passage, the rearward end of said tube being received in the forward end of said passage, a packing in said passage surrounding said tube, and a plug screw threaded into the forward end of said passage for compressing said packing and locking said tube to said member.

12. In a rock drill, the combination with the cylinder and piston thereof, of the tube 27 extending from the rear head through the piston into operative relation with a hollow drill steel, a socket 25 formed in the rear head, the member 37 adjustably screwed into said socket, a swivelled hose connection carried by the member 37, and the plug 41 and washer 45 for adjustably securing the tube to the member 37.

In testimony whereof, I have signed my name to this specification.

GEORGE H. GILMAN.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,596,873, granted August 24, 1926, upon the application of George H. Gilman, of Belmont, Massachusetts, for an improvement in "Drilling Machines," an error appears in the printed specification requiring correction as follows: Page 3, line 59, claim 9, before the word "tube" insert the word *said;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 12th day of October, A. D. 1926.

[SEAL.]

M. J. MOORE,
Acting Commissioner of Patents.