May 9, 1944. F. MILLER 2,348,402

DISPENSING DEVICE

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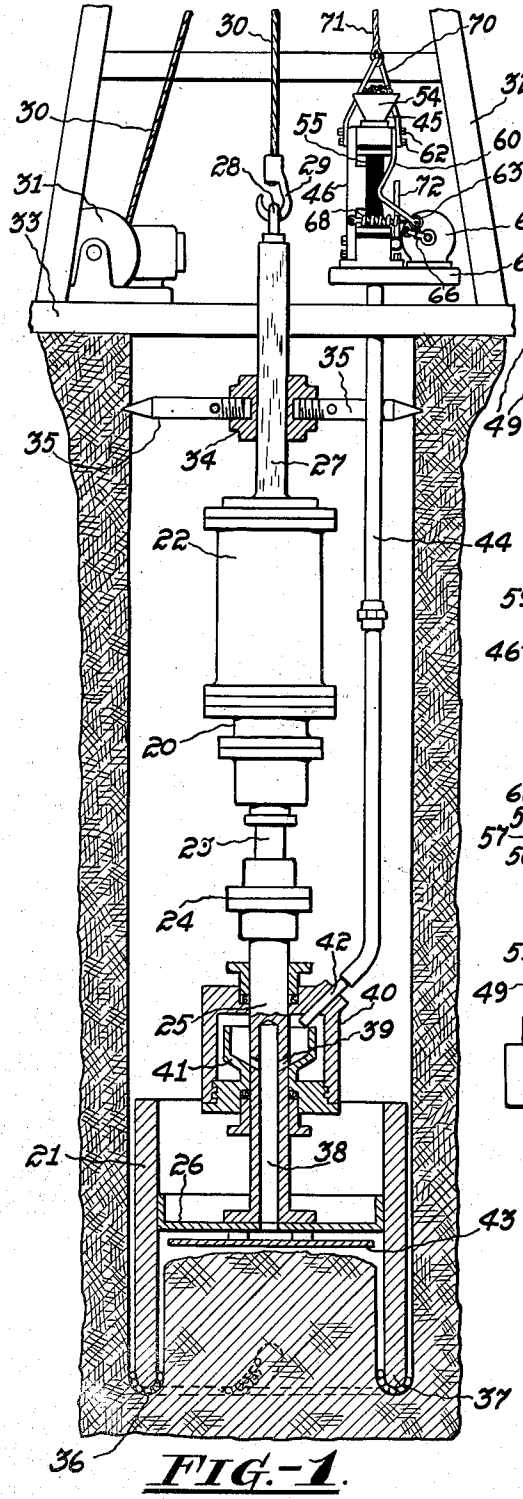


FIG.-1.

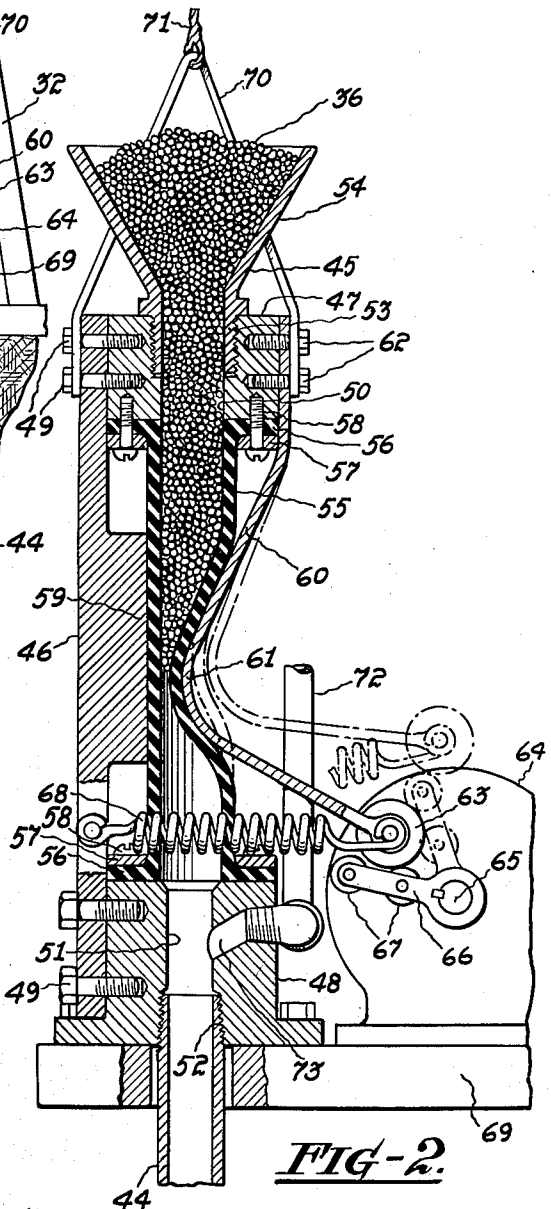


FIG-2.

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DISPENSING DEVICE

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Application June 2, 1943, Serial No. 489,375

1 Claim. (Cl. 222—529)

This invention relates to drilling apparatus of the rotary type, and more particularly to a dispensing device for supplying abrading material, such as shot and the like, to the cutting tool of the drilling apparatus.

One object of the invention is to assure the delivery of the abradant to the cutting tool in the quantities and at the intervals of time best suited to assure an efficient cutting or grinding action of the tool.

Other objects will be in part obvious and in part pointed out hereinafter.

In the drawing accompanying this specification and in which similar reference numerals refer to similar parts,

Figure 1 is an elevation, partly in section, of a drilling apparatus equipped with a dispensing device constructed in accordance with the practice of the invention, and

Figure 2 is an enlarged view in elevation, partly broken away, of the dispensing device.

Referring more particularly to the drawing, 20 designates, in general, a drilling apparatus of the rotary type comprising a tubular cutting tool 21 and a motor 22 for rotating it.

The motor 22 is arranged in coaxial relationship with the tool 21 and its shaft 23 is connected, by a coupling 24, to a stem 25 carried by the cutting tool. The stem 25 extends part way into the cutting tool for attachment to a plate 26 extending transversely of the said tool.

On the top of the motor 22 is a rod 27 having a loop 28 for connection with a hook 29 of a cable 30 leading to a hoist 31. The cable 30 may be trained over a sheave (not shown) supported by a derrick 32 spanning the work, and the hoist 31 may, as shown, rest upon the base 33 of the derrick. A spider 34 on the rod 27 is slidably interlocked therewith and carries pointers 35 to engage the wall of the hole being drilled for holding the casing of the motor 22 against rotary movement.

The drilling apparatus, as is customary, is provided with means for introducing water and abrasive material, as for example chilled shot 36, to the cutting teeth 37 of the tool 21. The stem 25 accordingly has a longitudinally extending passage 38 that is continued through the plate 26 and communicates at its upper end through ports 39 in the stem 25 with a box 40 arranged on the stem in such wise as to enable the stem to rotate freely with respect to the box. The ends of the box are suitably sealed to prevent leakage of water along the stem 25, and within the box is a hopper 41 to guide water and shot from a nozzle 42, in the wall of the box to the ports 39. A plate 43 disposed beneath the plate 26 and spaced therefrom deflects the water and shot outwardly into the kerf being cut.

The outer end of the nozzle 42 is connected to a conduit 44 that leads to a shot dispensing device 45, constructed in accordance with the practice of the invention, located at or near the mouth of the hole being drilled.

In the form of the invention shown, the dispensing device 45 comprises a body 46 the upper and lower ends of which are secured to laterally extending blocks 47 and 48, respectively, by bolts 49. The blocks 47 and 48 have bores 50 and 51, respectively, extending therethrough, and the lower end of the bore 51 is threaded to accommodate the threaded end 52 of the conduit 44. The bore 50 is also threaded at its upper end to accommodate the threaded hollow stem 53 of a hopper 54 serving as a supply bin for the shot 36.

Communication between the bores 50 and 51 is afforded by a tube 55 having flanges 56 at its ends to seat against the opposed surfaces of the blocks 47 and 48 to which they are secured by clamp rings 57 and screws 58 extending through the clamp rings and the flanges 56. The tube 55 preferably consists of rubber and an intermediate portion thereof rests against a boss 59 on the body 46.

Means are provided to intermittently depress the portion of the tube 55 adjacent the boss 59 for cutting off the flow of shot to the cutting tool. To this end the dispensing device is provided with a spring-arm 60 that extends downwardly along the side of the tube and has a bowed portion 61 intermediate its ends to bear against the outer surface of the tube 55 in the transverse plane of the boss 59. The upper end of the spring-arm is fixedly secured to the block 47 by screws 62, and the lower free end of said spring-arm carries a roller 63 against which force is applied for flexing the arm 60 to release the tube 55. Such force may be applied to the roller, as indicated, by a rotary motor 64, the shaft 65 of which carries an arm 66 to rotate in the vertical plane of the roller 63. The arm 66 preferably carries a roller, or rollers, 67 for engagement with the roller 63 to prevent localized wear on the peripheral surface of the latter. As a preferred arrangement a tension spring 68 is connected to the free end of the spring-arm 60 and to the body 46 for augmenting the pinching effect of the spring-arm on the tube 55.

The dispensing device 45 and the motor 64 are

mounted upon a platform 69, and in order that these elements may be raised and lowered in accordance with such movements of the drilling apparatus a bail 70 is connected to the block 47 and a cable 71 is attached to the bail for adjustably supporting the dispensing device.

To the end that the conduit 44 may serve to convey water as well as the abrasive material to the hopper 41, a conduit 72 leading from a source of water supply (not shown) is connected to the block 48, and a passage 73 in said block affords communication between the conduit 72 and the bore 51.

In the operation of the device, whenever it is intended to supply shot 36 to the tool 21, the motor 64 is set in operation. The arm 66 will then rock the spring-arm 60 outwardly and the bowed portion 61 will release the tube 55. Shot will then flow through the tube 55, the passage 51 and the conduit 44 into the hopper 41, thence through the passage 38 and across the plate to the working surface.

When the end roller 67 moves out of contact with the roller 63 the spring-arm 60 will, by reason of its inherent resiliency and the pull of the spring 68, snap toward the tube 55 and the bowed portion 61 will depress the tube and shut-off the flow of shot therethrough.

The rate at which the charges of shot will be passed through the dispensing device and the amount of shot included in a charge may be readily controlled, as will be understood by varying the contact angle between the rollers 67 and 63 or the speed of rotation of the motor 64.

I claim:

A device for dispensing a fluent material, comprising a vertical body having a container at its upper end, a flexible discharge tube for the container extending downwardly along the body, a spring arm extending downwardly along the side of the tube and having a bowed portion intermediate its ends to constrict the intermediate portion of the tube for preventing the flow of material through the tube, means for securing the upper end of the spring arm to the body at the upper end of the tube, and means for intermittently flexing the spring arm out of engagement with the discharge tube to permit the flow of material through the tube.

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