June 30, 1925. 1,543,765

G. H. GILMAN

DRILLING MACHINE

Filed July 30, 1921 2 Sheets-Sheet 1

Fig. 1.

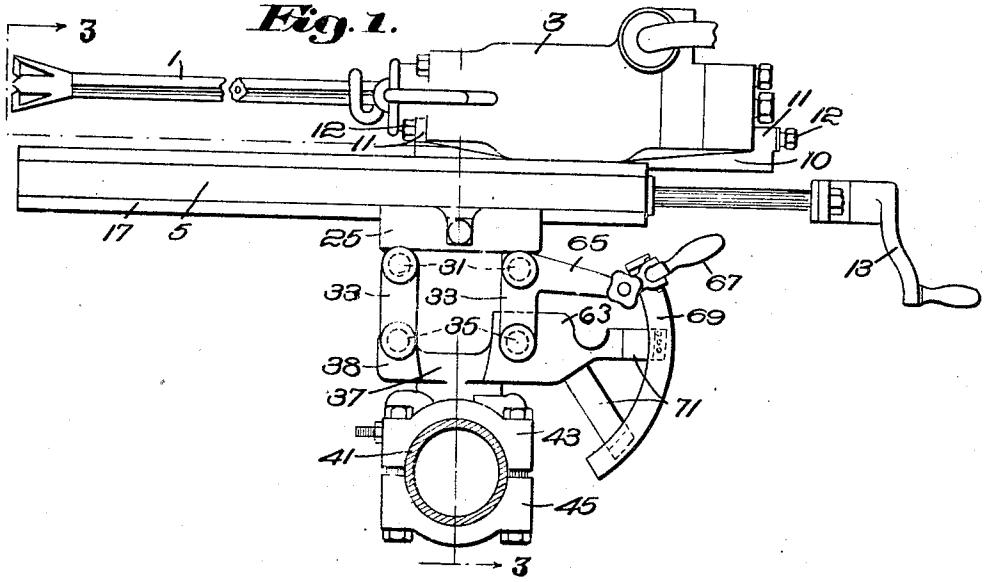
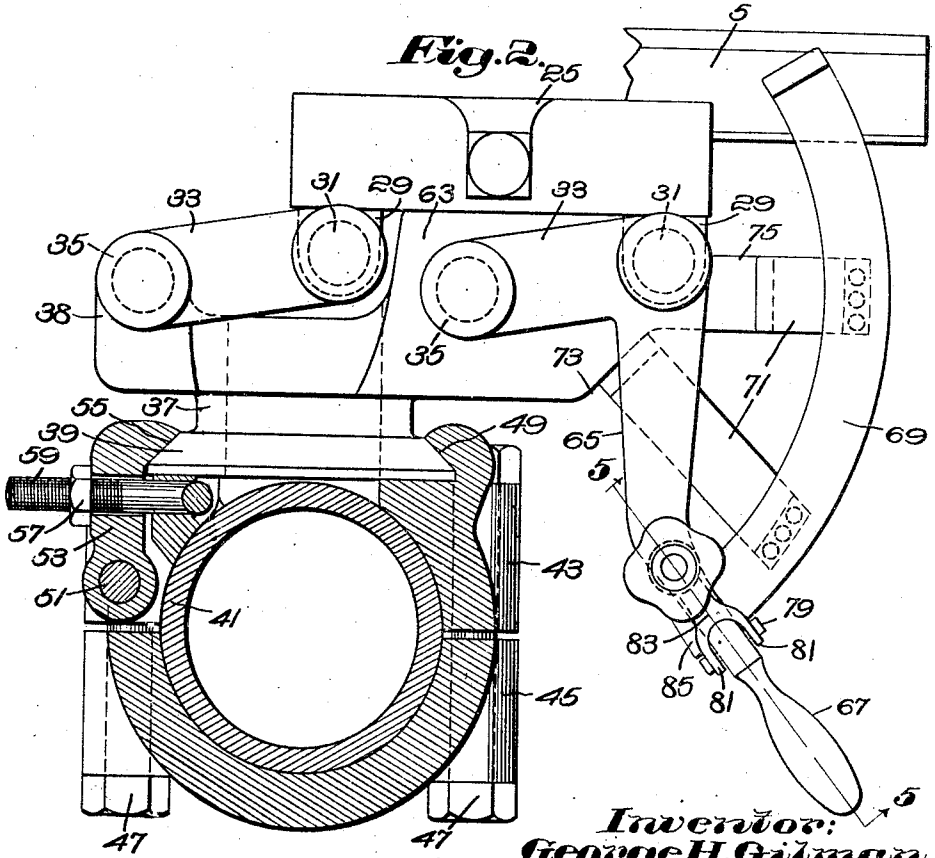


Fig. 2.



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2 Sheets-Sheet 2

Fig. 3.

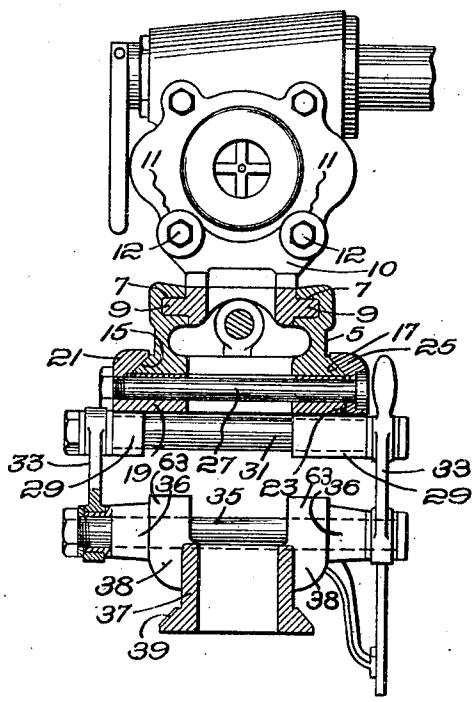


Fig. 5.

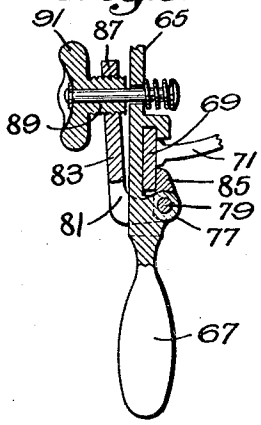
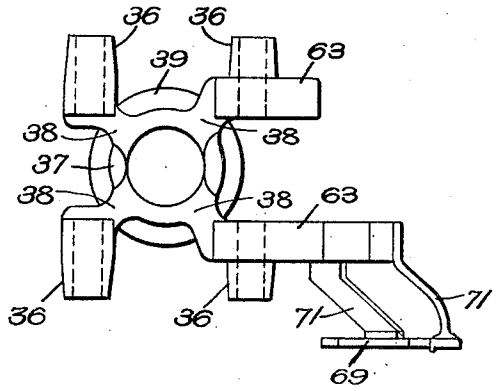


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE H. GILMAN, OF BELMONT, MASSACHUSETTS.

DRILLING MACHINE.

Application filed July 30, 1921. Serial No. 488,596.

To all whom it may concern:

Be it known that I, GEORGE H. GILMAN, a citizen of the United States, and a resident of Belmont, county of Middlesex, and State of Massachusetts, have invented an Improvement in a Drilling Machine, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

My invention relates to drilling machines and particularly to the mounting for the drilling tool and its actuator.

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

Referring to the drawings:—

Fig. 1 is an elevation of a breast stoper and its mounting constructed according to my invention;

Fig. 2 is a detail on an enlarged scale of parts shown by Fig. 1 when moved to another position;

Fig. 3 is a section on the line 3—3 of Fig. 1;

Fig. 4 is a plan of the base member; and

Fig. 5 is a section on the line 5—5 of Fig. 2.

Referring to the drawings, I have shown a drilling tool 1 and its actuator 3. These may be of any suitable or usual type and as shown the tool is a drill bit and the actuator a fluid pressure operated hammer drill. The mounting for the actuator comprises feeding mechanism for moving the actuator toward and away from the work and elevating and swivelling connection to a support for the machine.

The feeding mechanism for the actuator comprises the shell 5 having formed therein the oppositely located guideways 7 which receive the actuator guide members 9, and although the latter may be formed integrally or otherwise with the casing of the actuator I have shown them as part of the cradle 10, to the ears 11 of which the actuator is secured by means of the actuator side bolts 12. For moving the actuator back and forth along the ways any suitable or usual means may be provided, as for example, a feed screw, the handle of which is indicated at 13. As the details of the actuator and feeding mechanism do not form part of my present invention, the same will not be further described except as necessary to show how they are applied to the invention now under consideration.

As shown the shell is adjustably secured to the elevating mechanism hereinafter described and for this purpose on the lower portion of one of the sides of the shell I provide the longitudinally extending, bevelled surface 15 and on the opposite side a like bevelled surface 17. Resting against the bottom of the shell is a member 19 having the up-standing portion 21 conforming to the surface 15 of the shell. At the side of the member 19 and below the surface 17 of the shell, I form said member with a bevelled surface 23 oppositely inclined to the surface 17 and for engaging both of these surfaces I provide a member 25 of length approximating that of the member 19 and secured thereto by means of a bolt 27. As will be apparent, when the bolt is loose the members 19 and 25 may be slid longitudinally of the shell to the position desired and then clamped in place by tightening the bolt.

For attaching the elevating mechanism to the member 19 I integrally form with the lowermost side of the member 19 four perforated lugs 29, through pairs of which pass the bolts or pins 31. On the outer end of each bolt I pivot an end of a link 33. The other ends of the links I pivot to similarly arranged bolts 35 carried in the perforated lugs 36 formed integrally with the base member 37. These pivoted links constitute the elevating mechanism.

The body of the base member 37 I have shown formed as a hollow cylinder. From the upper outer surface of this cylinder radiates the arms 38 carrying the lugs 36 and on the lower end of the cylinder I form if desired a flange providing the frusto-conical surface 39 serving as a trunnion. The trunnion may be secured to any suitable support for the machine. As shown, this support is exemplified by the arm 41 carried by a mine column. For attaching the trunnion to the arm 41 I have shown a known attaching means which comprises the members 43 and 45 adapted to be clamped in adjusted position to the bar by means of bolts 47. The member 43 is provided with a recess 49 conforming to about 180° of the frusto-conical surface of the trunnion and

has pivoted thereto at 51 a member 53 provided with a surface 55 shaped to engage the frusto-conical surface of the trunnion and adapted to be adjusted relatively to the member 43 by means of the nut 57 and bolt 59. As will be understood by those skilled in the art, by this attachment the trunnion may be swivelled relatively to the bar 41 and clamped in adjusted position.

It will be understod that by means of the four links 33 the shell may be moved toward and away from the base member, Figs 1 and 2 respectively showing the extremes of movement. For supporting the shell when the parts are in the position shown by Fig. 2 I provide each of one pair of the arms 38 with upstanding portions 63 on which the member 19 is adapted to rest in the position of parts shown by Fig. 2. Preferably, but not necessarily, the links 33 are of equal length and the pins 31 and 35 so arranged as to lie at the corners of a parallelogram in order that when the shell is raised and lowered every position assumed by the actuator and drill bit will be parallel with all other positions assumed.

For operating the elevating mechanism I have shown a lever 65 formed integrally with one of the links 33 and provided with a handle 67. For holding the parts in their adjusted position relatively to the base I provide a quadrant-bar 69 carried on arms 71 secured by welding or otherwise to the projections 73 and 75 of one of the arms 38. To the quadrant-bar I may clamp the lever and for this purpose I provide the lever adjacent the outer side of the bar with a lug 77 through which passes the pin 79 engaging the bifurcations 81 of the clamp 83. The bifurcations of the clamp adjacent the pin 79 are integrally connected to the opposite end portions of the jaw 85 which is adapted to grip the bar 69 and to clamp it between the jaw and the lever 65. For actuating the clamp, the end thereof remote from the pin 79 is provided with a screw-threaded perforation 87 receiving the screw 89, the end of which engages the surface of the lever 65. Turning of the operating handle 91 of the screw in the proper direction will cause the lever 87 to be forced away from the lever 65 and this will cause the jaw to grip the quadrant-bar. To permit assemblage of the clamp on the lever 65 the handle 67 may be either welded to the lever after the clamp is placed in position or if desired the handle 67 may be made removable from the lever 65.

In practice, with the submitted embodiment of my invention, after the hole has been drilled with the parts in the position shown by Fig. 1, the actuator may be moved along the shell with the drill bit remaining stationary to permit the drill bit being pulled out of the chuck of the actuator, after which the parts may be moved into the position shown by Fig. 2 to permit the bit being withdrawn from the hole without the actuator interfering with such withdrawal.

It will be understood that, although I have described for purposes of illustration one specific embodiment of my invention, I am not limited thereby to its particular details and arrangement of parts and that wide deviations may be made from this embodiment and parts described omitted or other parts substituted therefor without departing from the spirit of my invention.

Claims:

1. The combination with a drill steel actuator of a support therefor comprising a base and a pair of links, means providing a pivotal connection between each link and said actuator and base, the four pivots thus formed being arranged to lie at the corners of a parallelogram, and to swing in a plane parallel to the axis of the drill steel so as to raise and lower the actuator and move it toward and away from the work, a lever for operating said links to cause them to swing for moving said actuator, and releasable locking means for preventing movement of said actuator.

2. In a machine of the character described, a drill steel actuator, a trunnion support, parallel motion means for swinging said actuator in a plane including its axis, said means including a link, means providing a pivotal connection between said link and said support and between said link and said actuator, a lever rigidly secured to said link for swinging said link, and releasable locking means for preventing movement of said actuator.

3. In a machine of the character described, a tool, its actuator, a feed shell, a trunnion support, a pair of equal links pivoted at opposite ends respectively and secured to said shell and support, a lever carried by one of said links, a quadrant-bar carried by said support, and means for securing said lever to said bar.

4. In a machine of the character described, a drilling-tool, its actuator, a feed shell, a trunnion support, a pair of equal links pivoted at opposite ends respectively and secured to said shell and support, a lever carried by one of said links, a quadrant-bar carried by said support, and means for clamping said lever in adjusted position along said bar.

5. In a machine of the character described, a tool, its actuator, a feed shell, a support for said machine, a pair of equal links pivoted at opposite ends respectively and secured to said shell and support, a lever carried by one of said links, a quadrant-bar carried by said support, and means for securing said lever to said bar.

6. In a drilling machine, a drill steel, a

hammer drill carrying said drill steel, a feed shell slidably supporting said hammer drill, a support for said machine, a pair of equal links pivoted at opposite ends respectively and secured to said shell and support, a lever operatively connected to one of said links for raising and lowering said hammer drill relatively to said support, and means for adjustably securing said lever to said support.

7. In a drilling machine, a drill steel, a hammer drill carrying said drill steel, a feed shell slidably supporting said hammer drill, a support for said machine, a pair of equal links pivoted at opposite ends respectively and secured to said shell and support, a lever operatively connected to one of said links for raising and lowering said hammer drill relatively to said support, and means including a member attached to said support and slidably connected to said lever for adjustably securing said lever in different positions.

8. In a drilling machine, a drill steel, a hammer drill carrying said drill steel, means providing a pair of pivoted links with a lever attached to one link, feeding means slidably supporting said hammer drill including a member to which one end portion of each link is pivoted, a support for the machine including a member to which the opposite end portion of each link is pivoted, and means including a part attached to one of said members and slidably connected to said lever for adjustably securing said lever in different positions.

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

GEORGE H. GILMAN.