Nov. 4, 1924. 1,514,048

M. P. HOLMES

MINING MACHINE

Filed April 2, 1919

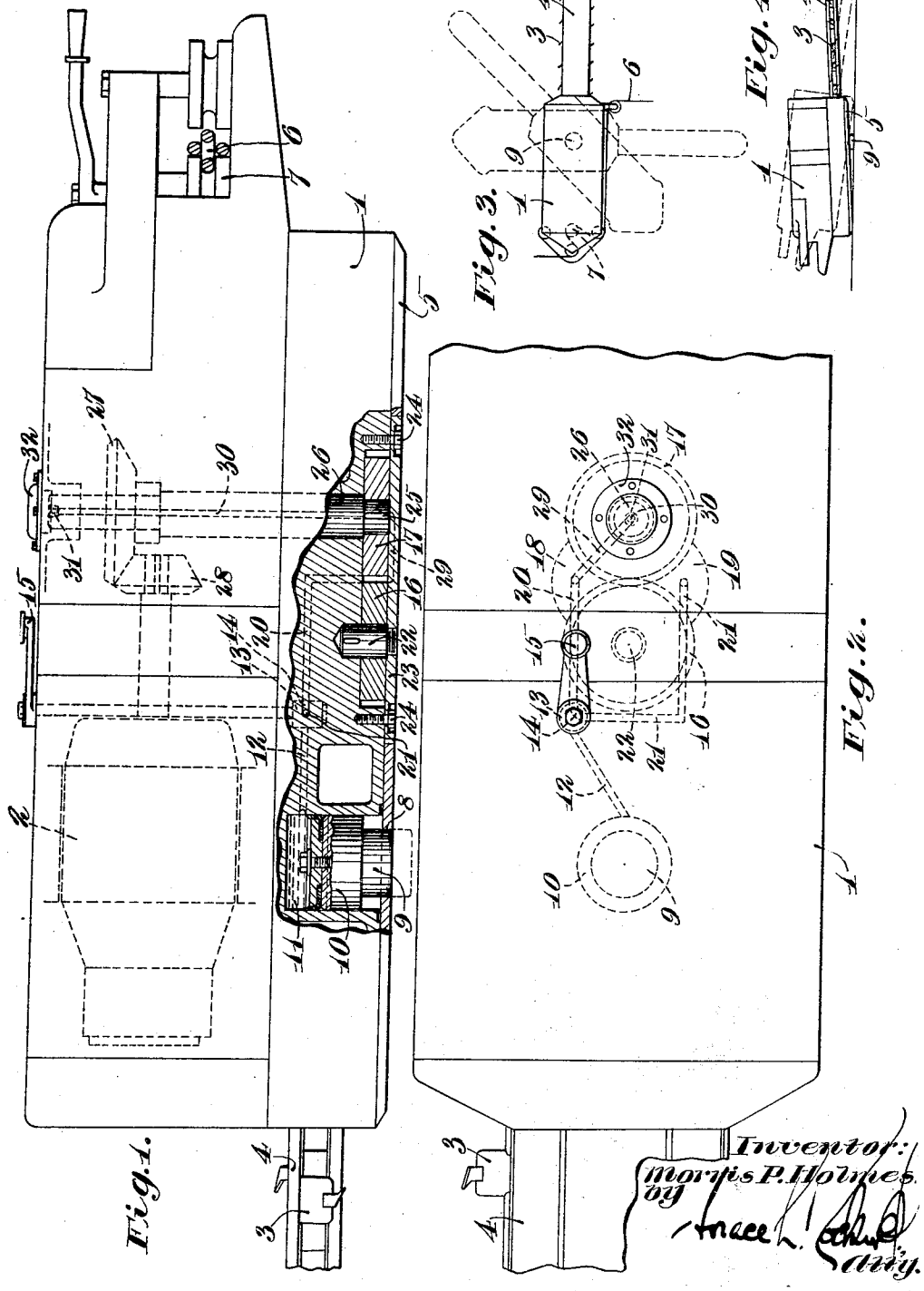


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

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Patented Nov. 4, 1924.

1,514,048

UNITED STATES PATENT OFFICE.

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MINING MACHINE.

Application filed April 2, 1919. Serial No. 287,024.

To all whom it may concern:

Be it known that I, MORRIS P. HOLMES, a citizen of the United States, residing at Claremont, in the county of Sullivan and State of New Hampshire, have invented certain new and useful Improvements in Mining Machines, of which the following is a full, clear, and exact specification.

My invention relates to mining machines.

It has for its object to provide improved means whereby a mining machine may be adjusted with improved facility relative to the mine floor. More particularly, my invention has for its object to provide an improved means whereby a machine may be elevated or angularly adjusted with increased facility, the same preferably being power driven and herein operatively connected to the motor of the machine. These and other objects and advantages of my improved construction will, however, hereinafter more fully appear.

In the accompanying drawings I have shown for purposes of illustration one embodiment which my invention may assume in practice.

In these drawings,—

Fig. 1 is a side elevation, partially in section, of a shortwall machine equipped with my improvement.

Fig. 2 is a plan view of a portion of the same.

Fig. 3 is a diagrammatic plan view showing the different positions of adjustment in a horizontal plane.

Fig. 4 is a diagrammatic side view showing different positions of adjustment of the machine in a vertical plane.

In this illustrative construction, I have shown a mining machine which may be of any usual type or construction, preferably including a frame 1 and a motor 2 operatively connected, through connections not shown, to a cutter chain 3 carried on a cutter bar 4, the machine shown herein being movable relative to the face on its own bottom, herein on a shoe 5 slidable over the mine bottom under the action of a flexible feeding member 6 operatively connected to a feed operating member 7 likewise driven from the motor 2 in a well known manner.

In my improved construction, it will be observed that the shoe 5 is provided with an aperture 8 therein, herein at a point substantially under the center of gravity of the machine. In this aperture 8 is movable a vertically adjustable lifting plunger or pivot member 9 which may obviously be actuated in various ways. Herein, it will be noted that this member is power operated, the same being provided with a piston 10 on its upper end movable in a cylinder 11 formed in the frame 1. As shown, the upper end of the cylinder 11 communicates with a pressure supply, through a passage 12 controlled by a manually rotatable valve 13 provided with a right angled passage 14 and controllable by a controlling lever 15 on the top of the machine. Herein this supply assumes the form of an oil pump comprising a plurality of intermeshing rotors, herein gears 16 and 17 having chambers 18 and 19 on opposite sides thereof normally communicating with the passage 12 through passages 20 and 21 controlled by the valve 13. Of these rotors, the member 16 is rotatable on a stud 22 having its lower end screwed into a removable section 23 of the shoe 5 and its upper end seated in the frame 1, and clamped between the frame and the shoe by the removable section 23 when the latter is itself clamped in position by means of screws 24. The cooperating rotor 17 is also similarly clamped in position, but herein it will be noted that this gear is splined at 25 to the lower end of a rotating shaft 26 driven through suitable gearing 27, 28 from the motor. Herein, it will also be observed that one of the chambers 18 and 19 is provided with a passage 29 leading to an axial opening 30 in the shaft 26, so that a new supply of fluid, herein oil, may be supplied to the pump at any desired time from the top of the machine, the aperture being normally closed, as by a removable plug 31, and a removable cover 32.

In the operation of my improved construction, it will be understood that the member 9 normally occupies its "up" or inoperative position wherein it lies flush with the bottom of the shoe 5. As a result, the machine may obviously be moved over the bottom bodily with the same facility as any present mining machine. However, when it is desired to move the machine angularly, it will be observed that it is unnecessary to

bar the same around laboriously. Instead, the pump controlling member 15 and its connected valve 13 is operated. As a result, communication is open between the passage 12 and one of the passages 20, 21 thereby enabling the gears 16 and 17 constantly rotated by the motor 2, to supply fluid under pressure through the passage 12 to the upper end of the cylinder 11 to depress the member 9 from the full to the dotted line position shown in Fig. 1, wherein it may be held by simply turning the valve 13 in such a manner as to seal the oil in the cylinder. Since this member 9 is disposed substantially beneath the center of gravity of the machine, the machine will, as a result, be raised bodily relative to the bottom in such a manner that by a relatively small lateral push or pull applied at either end of the machine, i. e., at its rear end or at the front end of its bar, the entire machine may be moved about the member 9 as a pivot and into the desired angle. When this position is reached, obviously the member 9 may be again rendered inoperative by simply reversing the position of the member 15 to again connect the valve 13 to one of the chambers 18, 19 and thereby permit the oil to be forced out of the cylinder 11 as the member 9, due to the weight of the machine, resumes its normal "in" position wherein its lower surface lies in the plane of the bottom of the shoe, and again operating the valve so that the fluid pumped flows in its normal circuit, i. e., from one of the chambers 18, 19 through one of the passages 20, 21, the valve passage 14, the other passage 20, 21 into the other chamber 18, 19 and around the rear of the rotor 17 back to its starting point. It will also be observed that in the operation of my improved construction, through varying the amount of movement of the valve 13, the amount of movement of the member 9 may be varied as desired. It will also be noted that, as shown in Fig. 4, the machine may also be tilted in a verticle plane in such a manner as to vary the angle of its bar with respect to the horizontal, by raising it on the member 9, blocking up or placing a skid under the rear or front end of the frame, and then releasing the member 9, the variations possible above by varying the amount of opening of the valve 13 also being obtainable here to vary the lifting movement as necessary.

As a result of my improved construction, it will be observed that it is entirely unnecessary to bar the machine around manually and laboriously in order to vary its angle or to present the bar in different directions, the entire effort required being the simple movement of the controlling member 15, whereupon the power of the machine is utilized to raise the machine and thus enable it to be swung readily in a horizontal plane into the desired angular position or tilted to the desired position. It will also be observed that my improved mechanism for accomplishing these new results is of an exceedingly simple and rugged character adapt to be supplied and kept in running order at small expense and during the normal operation of the machine to interfere in no way with the movement of the same over the mine bottom. These and other advantages of my improved construction will, however, be clearly apparent to those skilled in the art.

While I have in this application specifically described one embodiment which my invention may assume in practice, it is to be understood that the same is shown herein for purposes of illustration only and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

What I claim as new an desire to secure by Letters Patent is:

1. The combination with a mining machine having a bottom on which it is slidable, of a supporting plunger therefor telescopically mounted in the bottom thereof whereby the same may occupy a position in which no substantial portion of the weight of the machine is transmitted to the bottom thereby and also so engagable with the mine bottom as to transmit to the latter a substantial portion of the weight of the entire machine.

2. The combination with a mining machine having a bottom on which it is slidable, of a supporting pivot therefor telescopically mounted in the bottom thereof and engageable with the mine bottom.

3. The combination with a mining machine having a bottom on which it is slidable, of elevating means engageable with the mine bottom mounted in the bottom thereof adjacent the center of gravity of said machine.

4. The combination with a mining machine having a bottom on which it is slidable, of a plunger normally flush with the bottom thereof whereby it acts to transmit to the bottom no substantial portion of the weight of the machine but depressible therethrough into such forcible engagement with the mine bottom as to elevate the center of gravity of the machine.

5. The combination with a mining machine, of an apertured shoe, and a pivot member normally forming a part of the surface of said shoe and vertically adjustable in said aperture.

6. The combination with a mining machine having a bottom on which it is slidable, of means for facilitating rotation in a horizontal plane or a longitudinal tilting movement thereof while on the mine bottom including a depressible longitudinally movable

supporting member movable through said machine bottom and engaging the mine bottom.

7. The combination with a mining machine, of a supporting shoe therefor having an aperture therein on the longitudinal center line of said shoe, and a machine supporting plunger normally closing said aperture and vertically adjustable therein.

8. The combination with a mining machine, of a supporting shoe therefor having an aperture therein on the longitudinal center line of said shoe and adjacent the center of gravity of said machine, and a machine supporting plunger normally closing said aperture and vertically adjustable therein.

9. The combination with a mining machine, of a supporting shoe beneath the same having an aperture therein, a machine supporting plunger disposed in said aperture and normally forming a part of said shoe, and means actuated by said machine for moving said plunger in said aperture.

10. The combination with a mining machine, of a supporting shoe beneath the same having an aperture therein, a machine supporting plunger disposed in said aperture and normally forming a part of said shoe, and means including a pump for moving said plunger in said aperture.

11. The combination with a mining machine, of a supporting shoe beneath the same having an aperture therein, a machine supporting plunger disposed in said aperture and normally forming a part of said shoe, and means for moving said plunger in said aperture including a piston and cylinder and a cooperating controlling valve.

12. The combination with a mining machine, of a supporting shoe beneath the same having an aperture therein, a machine supporting plunger disposed in said aperture and normally closing the same, and means for moving said plunger in said aperture including a pump driven by said machine, a cylinder, a plunger actuating piston therein, and a manually controlled valve controlling the supply of fluid from said pump to said cylinder.

In testimony whereof I affix my signature.

MORRIS P. HOLMES.