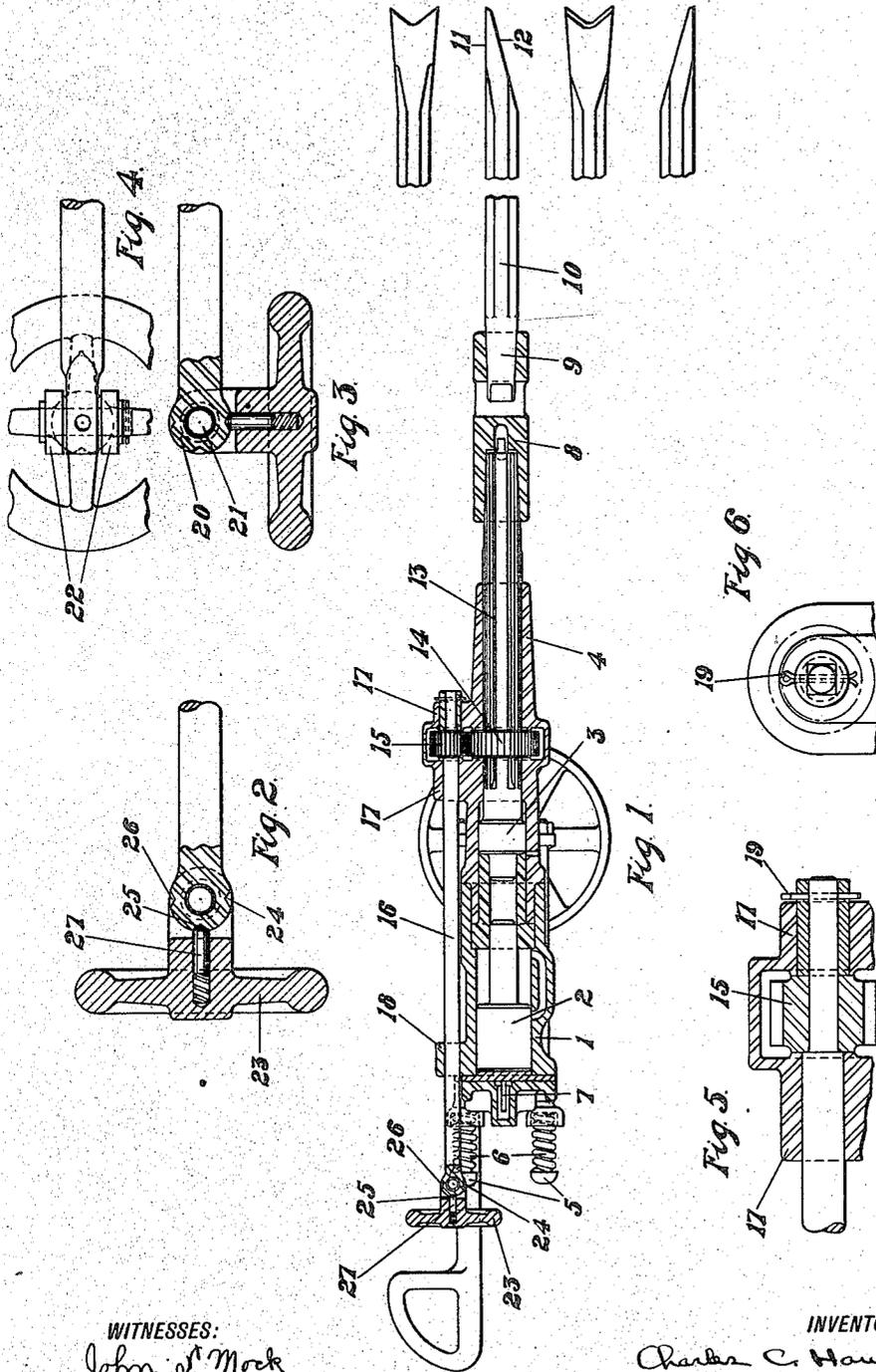


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C. C. HANSEN.
COAL MINING MACHINE.
APPLICATION FILED DEC. 12, 1912.

1,154,922.

Patented Sept. 28, 1915.



WITNESSES:
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COAL-MINING MACHINE.

1,154,922.

Specification of Letters Patent.

Patented Sept. 28, 1915.

Application filed December 12, 1912. Serial No. 736,253.

To all whom it may concern:

Be it known that I, CHARLES C. HANSEN, a citizen of the United States, residing at Easton, in the county of Northampton and State of Pennsylvania, have invented a certain new and useful Improvement in Coal-Mining Machines, of which the following is a specification.

This invention relates to coal-mining machines and more particularly to a hammer tool of this type having means for adjusting and holding the cutting tool in different operative positions.

The coal picking machines ordinarily used in practice consist of an operating cylinder in which reciprocates a piston having a forwardly extending rod, to which is attached a picking tool with two or more points or facets. In using this tool, an undercut is made in the entry where it is in use simply by continuous reciprocating blows with the pick or bit always in one position. This results in reducing practically all the coal cut out in making the undercut, to the condition of fine particles or slack, which is of little value.

The object of the present invention is to construct a machine with which this coal cut out in making the undercut can be taken out in large lumps without waste, and to accomplish this result the machine consists broadly of a bit shaft which does not reciprocate, but is actuated by the impact of a hammer piston, and is provided with a wedge-shaped chisel bit and with means to turn this bit into four positions and maintain it in these positions without attention from the operator. With this drill a different system of cutting is used, as the bit is first rotated in one place to drill a hole the depth of the desired undercut, and then the coal is broken off toward the hole from four directions, the position of the bit being changed for each direction. With this object in view, I have devised a machine a practical embodiment of which is shown in the accompanying drawings in which:

Figure 1 shows a longitudinal section through the coal cutter with views of the bit in its four necessary positions; Figs. 2, 3 and 4 show details of the bit rotating handle in various positions; Figs. 5 and 6 show details of the pinion mechanism for rotating the bit.

As shown the coal cutter comprises a

cylinder 1, in which reciprocates a piston 2 which actuates by its impact a bit shaft 3. The bit shaft 3 is adapted for slight longitudinal movement in an elongated front head 4, which is secured to the cylinder 1 by bolts 5, yielding connection between the cylinder and front head being secured by springs 6. The reciprocations of the piston 2 are governed by a valve 7 of ordinary construction, the details of which form no part of the present invention. The bit shaft 3 projects through the forward end of the front head 4, and is provided on its front end with a chuck 8, which is recessed in its forward end to receive the shank 9 of the chisel bit 10. The chisel bit used in this machine is wedge shaped, with a straight face 11 on one side and an inclined face 12 on the other. The bit shaft 3 is provided on its forward part with flutes 13, which slide in corresponding grooves in a gear wheel 14 so mounted in the front head 4 that it is capable of rotary but not longitudinal movement. Intermeshing with the gear wheel 14 is a pinion 15 which has half as many teeth as the gear wheel 14. This pinion 15 is mounted on a squared portion of an operating shaft 16, which is journaled in bearings 17 and 18, respectively, on the front head 4 and cylinder 1. The shaft 16 is held from longitudinal movement by a cotter pin 19 passing through the shaft in front of the forward bearing 17. The shaft 16 terminates at its rear end in a flat-sided cylindrical knob 20. Through the knob 20 passes a pivot pin 21, to the outer ends of which are secured two projecting lugs 22 of a hand wheel 23 of considerable weight. Depressions 24, 25 and 26 are provided at angles of 90° on the periphery of the knob 20, which are adapted to be engaged by a spring pressed pin 27 sliding longitudinally in the hub of the hand wheel 23. The bit shaft can be rotated as in any other rotating drill if the hand wheel 23 is maintained in alinement with the shaft.

In making an undercut with this machine a hole is first drilled to the depth of the desired undercut by rotating the bit during operation like an ordinary boring drill. The chisel bit is then set vertically and a horizontal cut made by breaking the coal in toward the hole from one side. Into such a cut the coal can be broken from any direction. To set the chisel bit in any one of the

four desired positions, the handle 23 is dropped down below the shaft 16 so that the pin 27 engages one of the depressions in knob 20, say, the depression 24 as shown in Fig. 3. The weight of the hand wheel 23 is such that the shaft 16 and hence the bit shaft 3 and the bit 10 will be held securely and yet more or less yieldably in the desired position. When it is desired to turn the bit to another position, say, at an angle of 90° from the first, the hand wheel 23 is lifted to the position shown in Figs. 1 and 2 with the pin 27 engaging the depression 25 and is rotated through a half revolution and again dropped below the shaft, the pin then engaging the depression 26. The ratio of the gear wheel 14 and pinion 15 being two to one, a half revolution of the hand wheel 23 will turn the bit only through one quarter of a revolution and will place it in a position at an angle of 90° from the first position. In similar manner the bit can be placed in any one of the four desired positions and held in such a position without further attention from the operator until he wishes to move it again.

It is to be understood that the present showing and description discloses only one specified modification of my invention and other forms and modifications are included in the spirit and scope of the invention as expressed in the claims.

What I claim is:

1. In a coal cutter, a cylinder, a piston, a bit shaft operated by said piston and rotatably mounted in said cylinder, means to rotate said shaft and means to yieldably secure said shaft in predetermined positions.

2. In a coal cutter, a cylinder, a hammer piston, a bit shaft rotatably mounted in said cylinder and adapted to be struck by said piston, means to rotate said shaft, and means to yieldably secure said shaft in predetermined positions.

3. In a coal cutter, a cylinder, a piston, a bit shaft rotatably mounted in said cylinder

and adapted to be operated by said piston, means to rotate said shaft and means to yieldably secure said shaft in four determined positions of rotation.

4. In a coal cutter, a cylinder, a piston, a bit shaft rotatably mounted in said cylinder and adapted to be operated by said piston, a gear wheel surrounding said shaft and having longitudinal sliding connection therewith, a pinion engaging said gear wheel, an operating shaft for said pinion, a handle pivotally connected to said operating shaft and means to hold said handle in alignment with said shaft to operate the shaft or lowered to yieldably hold said shaft in position.

5. In a coal cutter, a cylinder, its piston, a bit shaft operated by said piston, a gear wheel on said shaft, a pinion engaging said gear wheel and having half its number of teeth, means for rotating said pinion and means for yieldably locking said rotating means at desired points in its revolution.

6. In a coal cutter, a cylinder, its piston, a bit shaft actuated by said piston, a gear wheel on said bit shaft, a pinion engaging said gear wheel, an operating shaft for said pinion, and a locking element connected to said shaft and adapted to be moved below said shaft to hold said shaft in position by gravity.

7. In a coal cutter, a cylinder, its piston, a bit shaft operated by said piston, a gear wheel on said shaft, a pinion engaging said gear wheel and having half its number of teeth, a shaft for rotating said pinion and a handle movable out of alignment with said shaft for locking said rotating means at desired points in its revolution.

In testimony whereof, I have hereunto set my hand.

CHARLES C. HANSEN.

Witnesses:

JOHN L. MOCK,
R. J. DAY.