(No Model.)

B. YOCH.

CUT-OFF VALVE FOR MINING MACHINE ENGINES.

No. 306,570. Patented Oct. 14, 1884.

Fig. 1.

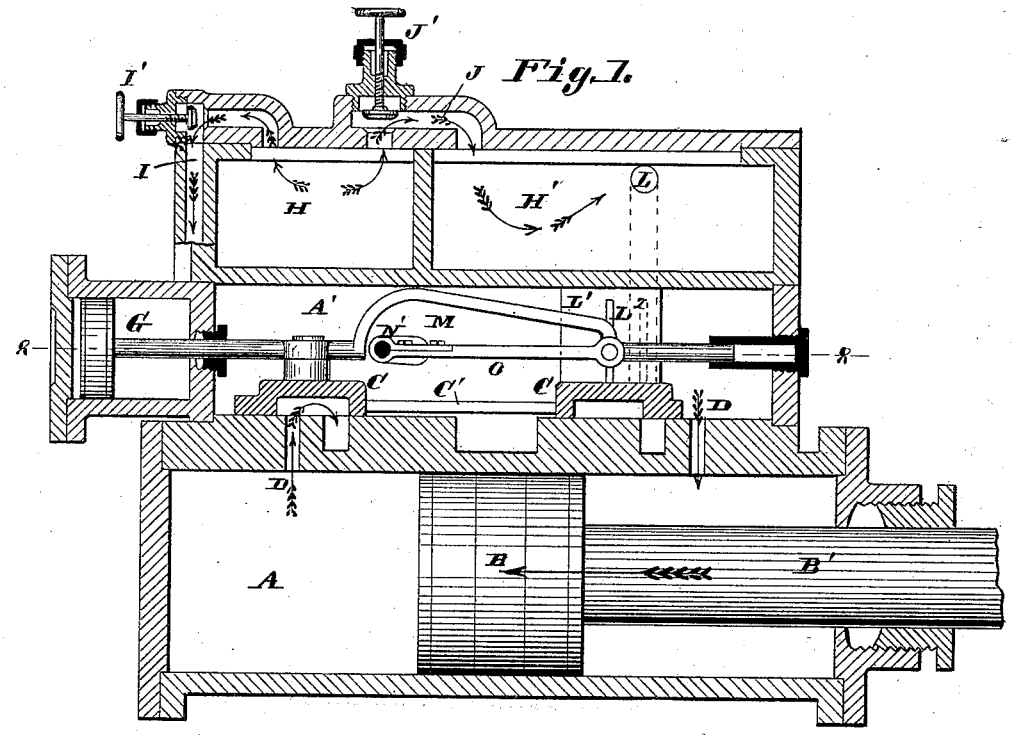


Fig. 2.

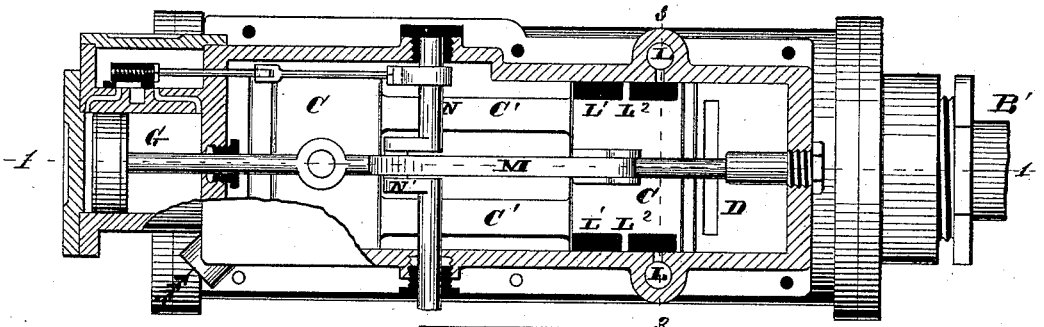
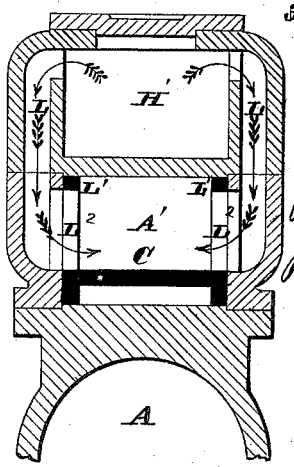


Fig. 3



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UNITED STATES PATENT OFFICE.

BENHARD YOCH, OF ST. LOUIS, MISSOURI.

CUT-OFF VALVE FOR MINING-MACHINE ENGINES.

SPECIFICATION forming part of Letters Patent No. 306,570, dated October 14, 1884.

Application filed April 1, 1884. (No model.)

To all whom it may concern:

Be it known that I, BENHARD YOCH, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Cut-Off Valves for Mining-Machine Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a vertical longitudinal section taken on line 1 1, Fig. 2. Fig. 2 is a horizontal longitudinal section taken on line 2 2, Fig. 1, and Fig. 3 is a vertical transverse section taken on line 3 3, Fig. 2, part of the cylinder being broken away.

My present invention relates to those engines wherein the supply of motive power to the chest is shut off during the time that the supply is entering the cylinder, and the supply to the cylinder is shut off during the time the supply is entering the chest, the object being to get the greatest force behind the piston at the commencement of its stroke, and which will gradually decrease as the piston nears the end of its stroke, thus differing from an ordinary engine wherein a full supply of motive power continues to enter the cylinder until the port is closed by the valve. This, in a mining-machine engine especially, is of great practical importance, in that the power is had at the commencement of the stroke, where it is most needed.

My improvement consists in applying this principle to an ordinary cylinder, ordinary steam-chest, and ordinary valve, as hereinafter described, and pointed out in the claims.

I will proceed to describe my preferred mechanical means for carrying out the above, reference being had to the accompanying drawings, in which—

A represents the cylinder; B, the piston; B′, the piston-rod; A′, the chest on top of the cylinder A; D D, the ports between the chest and cylinder; C C, the valves of the ports D; G, a small engine, to the piston-rod of which the valves C are connected; H H′, receivers on top of the chest A′; I, a port connecting the receiver H with the small engine G; I′, a valve in the port I; J, a port connecting the receiver H with that H′; J′, a valve in the port J; L L, ports forming a communication between the receiver H′ and the chest A′, and L′ L′ valves of the ports L.

I prefer to make the piston-rod of the small engine in two parts, connected by a yoke, M, which is arched to give room for the crank N′ of the shaft N, which is connected to the valve of the small engine in the ordinary way, as shown in Fig. 2, the crank being connected to the piston-rod of the small engine by a link or bar, O. Both of the valves C may be secured to the piston-rod of the small engine, or one only may be secured to it, and the other made fast to this first one by arms C′, as shown. The ports L extend through the sides of the chest A′, as shown plainly in Fig. 3, and the valves L′ are preferably secured to and extend up from one of the valves C, as shown; but they may be secured to the piston or yoke of the small engine, and one only with one port L, of course, could be used, though two are preferred. The ports L are closed, except when openings L^2 in the valves L′ come opposite them, and this takes place only when the ports D are closed, so that the above-described result is obtained. When they are opened, a charge of motive power enters the chest, and after they are closed and before they are opened again one of the ports D, (according to the direction in which the valves are moving,) is opened and closed, the charge having passed into the cylinder A.

I do not wish to confine myself to any form or shape of receiver or receivers, as the same may be varied, and, if desired, both engines supplied from one receiver. The openings from the ports L to the chest, and the openings L^2 may be duplicated, if desired, to permit a quicker influx of motive power to the chest.

Another great practical advantage of my improved arrangement is that there is very little, if any, pressure upon the valves C at the time they are changing the direction of their movement, owing to the fact that the chest is not charged with motive power at these times, the last charge having gone into the cylinder, and another charge not having entered the chest. All danger of the valves sticking at this point is thus overcome.

I claim as my invention—

1. The combination of the cylinder A, having ports D D, chest A′ on the top of the cyl-

inder, having port L^2, valves C C, to control cylinder-ports, valve L′, to close port L^2 before ports D are opened, and receiver H′ on the top of the chest, having port L, to supply the chest when cylinder-ports are closed, all arranged as shown and described.

2. The combination of the cylinder A, having ports D D, chest A′ on the top of the cylinder, having ports L^2 L^2, valves C C, to control cylinder-ports, valves L′ L′, to close chest-ports before cylinder-ports are opened, small engine G, having piston-rod connected to the valves C C, receivers H and H′ on the top of the chest, the receiver H having discharge-ports I and J, and the receiver H′ having ports L L to the chest, and valves I′ and J′ in the discharge-ports of the receiver H, the ports L L of the receiver H′ being opened by the valves L L while the cylinder-ports are closed, as set forth.

BENHARD YOCH.

In presence of—
GEO. H. KNIGHT,
SAML. KNIGHT.