

(No Model.)

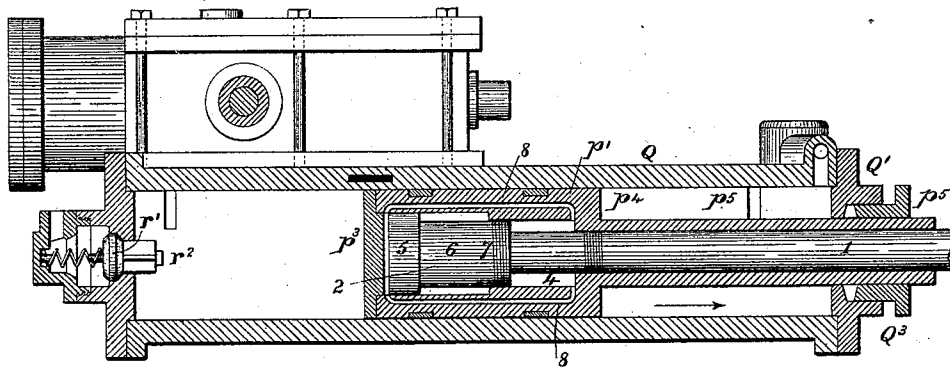
3 Sheets—Sheet 2.

B. YOCH.
MINING MACHINE.

No. 304,395.

Patented Sept. 2, 1884.

FIG. 12.



Attest.

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(No Model.)

3 Sheets—Sheet 3.

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Fig. 13.

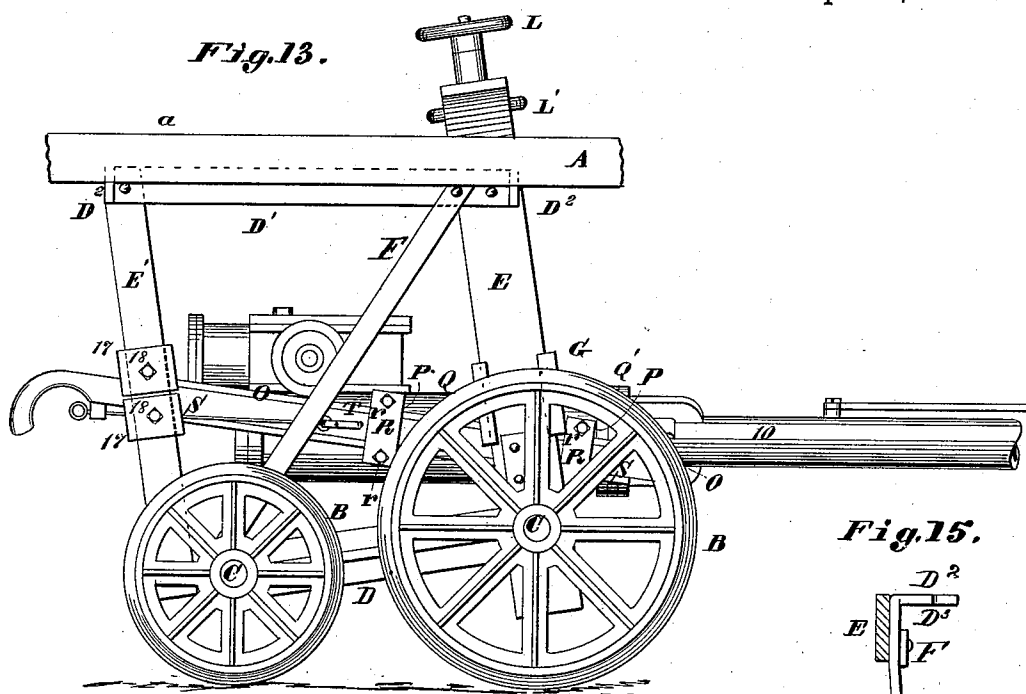


Fig. 15.

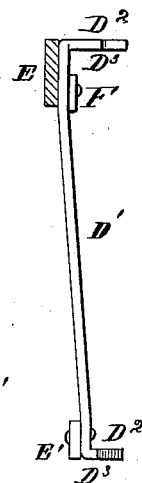
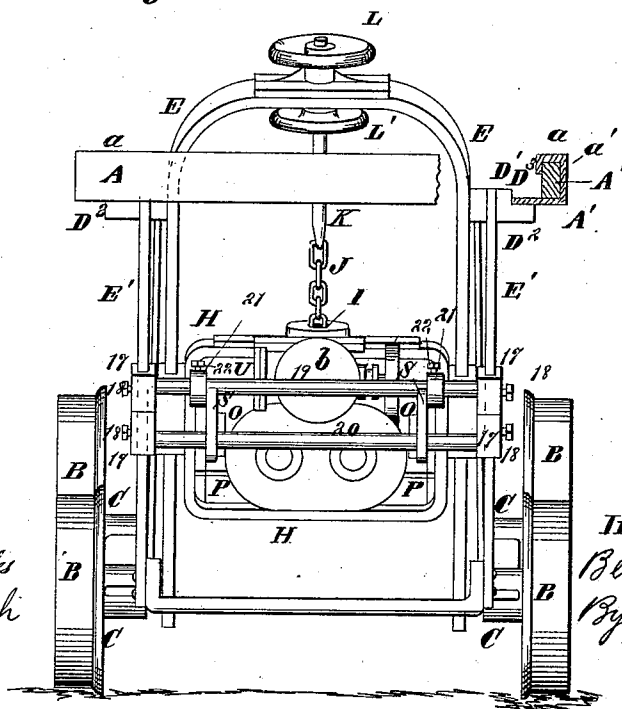


Fig. 14.



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UNITED STATES PATENT OFFICE.

BENHARD YOCH, OF ST. LOUIS, MISSOURI.

MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 304,395, dated September 2, 1884.

Application filed July 31, 1882. (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 Mining Engine or Machine, of which the following is a specification, reference being had to the accompanying drawings, forming part of the same.

In the drawings, Figure 1 is a longitudinal section at 1 1, Fig. 2. Fig. 2 is a transverse section at 2 2, Fig. 1. Fig. 3 is a transverse section at 3 3, Fig. 1, enlarged. Fig. 4 is a transverse section at 4 4, Fig. 1, enlarged. Fig. 5 is a transverse section of the cylinders through the exhaust-port, enlarged. Fig. 6 is a detail longitudinal section, showing in top view the spring-catch by which the handle is held in position. Fig. 7 is a detail section of a suspension-bracket. Fig. 8 is a horizontal section at 8 8, Fig. 2. Fig. 9 is a detail side elevation of the pick. Fig. 10 is a top view of the pick part in horizontal section. Fig. 11 is a top view of part of the platform upon which the truck stands, the central part being open. One end is broken off. Fig. 12 is a vertical longitudinal section through the double-piston cylinder. Fig. 13 is a side view of the truck, with the platform supported thereon; and Fig. 14 is a rear view of same, part in section. Fig. 15 is a top view of a side bar.

The platform upon which the truck-wheels stand consists of a frame, A, that may be of boiler-plate. It has two opposite edges, *a*, turned upward, inward, and downward, to form rails, upon which the wheels are supported when the machine is in use. The frame A has an extension, A', consisting of rails *a'* and connecting cross-bars or ties *a''*. The rails of the extension slide within the incurved edges or rails *a* of the part A. The arrangement is such that the part A' can be moved forward as the work goes on, to form an extension of the platform. Thus it will not be necessary to move forward the part of the platform upon which the truck stands. The rear ends, *a''*, of the rails *a'* incline downward toward the rails *a'* of the extension.

The truck is supported on four flanged wheels, B, turning on axles or spindles C, se-

cured to side bars D of the truck-frame and to the arch E. The arch E is firmly attached to the side bars D at their forward ends.

E' are uprights attached to the rear ends of the bars D, said uprights being connected to the arch by side bars, D', extending from their upper ends.

F are braces, of which there is one upon each side, extending from the arch to the rear end of the side bar D. The ends of the bars D' are turned out, in brackets D² upon which the platform A A' may be supported when moving the machine from place to place. The brackets D² are made with shoulders D³, against which the platform bears to prevent its transverse movement.

G are sliding brackets, movable upward and downward on the sides of the arch. These brackets are attached to a hoop, H. The hoop H is suspended upon a swivel-block, I, that turns in a socket in the upper bar of the hoop.

J is a suspension-chain extending through the block and hung to a screw-rod, K, passing up through the top of the arch.

L L' are hand-nuts on the rod K, the one above and the other beneath the arch.

J' is a pin or key passing beneath the chain and through the swivel-block, to sustain the latter.

M is a cross-bar attached to or made in one piece with the swivel-block, and ending in pins *m*, upon which are supported hangers N, whose lower parts have side channels that receive the side bars O. The side bars are embraced by brackets P, extending from the sides of the two cylinders Q. The cylinders can be moved longitudinally upon the side bars.

R are plates secured to the ends of the brackets by bolts *r* and bearing against the outer sides of the side bars O, so as to bind the bars tight in their bearings. The side bars O, are made with channels, in which fit the handle-bars S with sufficient freedom to allow their longitudinal movement in the channels. The handles are held to the required position in the channels by a spring-catch, T, whose end passes through the handle and into one of a series of holes, *o*, in the side bars.

t is a spring beneath the heel of the catch, which tends to throw the catch into engagement with the bar O.

t' is a pull-rod extending from the catch to the hand-hold s , for the purpose of pulling out the catch to disengage it from the bar O.

The cylinders Q are arranged side by side. They have capacity for oscillation in a horizontal plane on the supporting-chain and swivel J and I, and in a vertical plane upon the pins m . Thus it will be seen that the cylinders have universal motion within the hoop H, and the hoop has vertical adjustment upon the arch E, as before described.

The engine would usually be actuated by compressed air, because steam would render the mine too hot and damp; but I do not confine myself to compressed air as a medium of power.

The piston of one cylinder is solid and fast upon the piston-rod 1, while the piston p' of the other cylinder is hollow and has longitudinal movement upon an interior piston, 2, that is fast upon the rod 1. The piston p' is in form of a cylinder having two bores, 3 and 4, of different diameter, one in advance of the other; and the piston 2 has two parts, 5 and 6, turned to fit the bores 3 and 4 of the cylindrical piston. The part 6 is fitted to its bore 4 with a packing, 7. The bores or chambers 3 and 4 communicate together by air passage or passages 8, entering the chambers at the heads p^3 p^4 of the piston p' . The construction is such that when the piston p' first receives the pressure of the air upon its end it commences to move upon the fixed piston 2, the air passing through the passage 8 from one chamber to another. When the end of the piston p' has come in contact with the piston 2, they move together until the piston p' has reached the end of the stroke. Then the piston 2 is carried on by its momentum and by the pressure of the air upon piston p until the stroke is completed.

p^5 is a tube extending from the movable piston p' and fitting as a sleeve on the rod 1 of the piston 2. The piston rods and sleeve p^5 pass through stuffing-boxes Q^3 and into a guide, 10, within which the sleeve ends, the rods 1 extending through and having attached to them a cross-head, 11, that forms the head to receive the shank of the drill or pick 12. The drill or pick 12 is preferably set nearly in line with the rod of the piston p .

13 is a scraper for the removal of the disintegrated material from the pick-hole, the scraper being folded against the pick when it is moving forward and being thrown outward therefrom before the commencement of the backward movement of the pick. To accomplish this automatic movement of the scraper, it is hinged to the cross-head at 14, and is connected by a rod, 15, to a stud, 16, extending from the sleeve p^5 through a longitudinal slot in the guide 10.

The operation is as follows: Supposing the pick to have reached the end of the stroke, the loose piston p' and the sleeve p^5 first commence to move backward and act, by means of the rod 15, to draw the scraper 13 out from the pick, to throw out the loose material. These parts move back in this position until the loose piston p' reaches about the end of its back-stroke; then, as the pistons p and 2 continue to move backward, the scraper is again folded against the pick. When the piston p reaches the valve-stem v —should it do so before its momentum is exhausted—the valves v' of both cylinders are opened and the compressed air is admitted between the pistons p and p' and the heads Q, to check the further backward movement of the pistons, (as aforesaid.) It will be observed that the piston p' is made longer than that p , in accordance with the amount of its lost motion on the piston 2.

I will now describe a means provided to hold the engine proper to any desired inclination on the truck. This is done by means of the handles S and adjustable horizontal bars supported on the uprights E'.

17 are collars sliding on the uprights E', and held in position by set-screws 18.

19 and 20 are bars, respectively above and below the handles S, by which the upward or downward movement of the handles may be limited, and consequently the downward or upward movement of the pick.

21 are collars movable on the rod or bar 19, and held in place by set-screws 22. These collars may be used to limit the side movement of the handles.

I reserve the right to claim the matter relating to steam-engines and steam-drills in another application.

I claim as my invention—

1. The combination of a cylinder, an inner piston having a piston-rod provided with a drill-pick, a hollow piston and sleeve surrounding and between the inner piston and the piston-rod and the cylinder, and a scraper hinged to the piston-rod and connected to the sleeve, as set forth.

2. The combination of two cylinders placed side by side, two pistons, each piston having a piston-rod, a cross-head constructed to hold a drill-pick, a scraper hinged to the cross-head, a hollow piston and sleeve intermediate of one piston and piston-rod, and cylinder, and means to connect the scraper to the sleeve, as set forth.

3. In a mining-machine, the combination of a cylinder, a truck, an arch secured to the truck, brackets secured to the sides of the cylinder, a cross-bar journaled in said brackets and having a swivel-block, a suspension-chain secured to the swivel-block and rod, and nut supporting the cylinder from the arch by means of the chain, swivel-block, and cross-bar, as set forth.

4. The combination of a cylinder having channeled side bars formed with series of holes, handle-bars to slide in said channels, and catches engaging through the handle-bars with the holes in the side bars, as set forth.

handles, of the adjustable horizontal bars on the cylinder, having collars adjustable on the uprights, as set forth.

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5. The combination, with a truck, uprights at the rear end of the truck, and a cylinder pivoted in the truck, having side bars and

Witnesses:

SAML. KNIGHT,
GEO. H. KNIGHT.