L. KOVATCH.

COAL MINING MACHINE.

APPLICATION FILED AUG. 12, 1909.

960,958.

Patented June 7, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

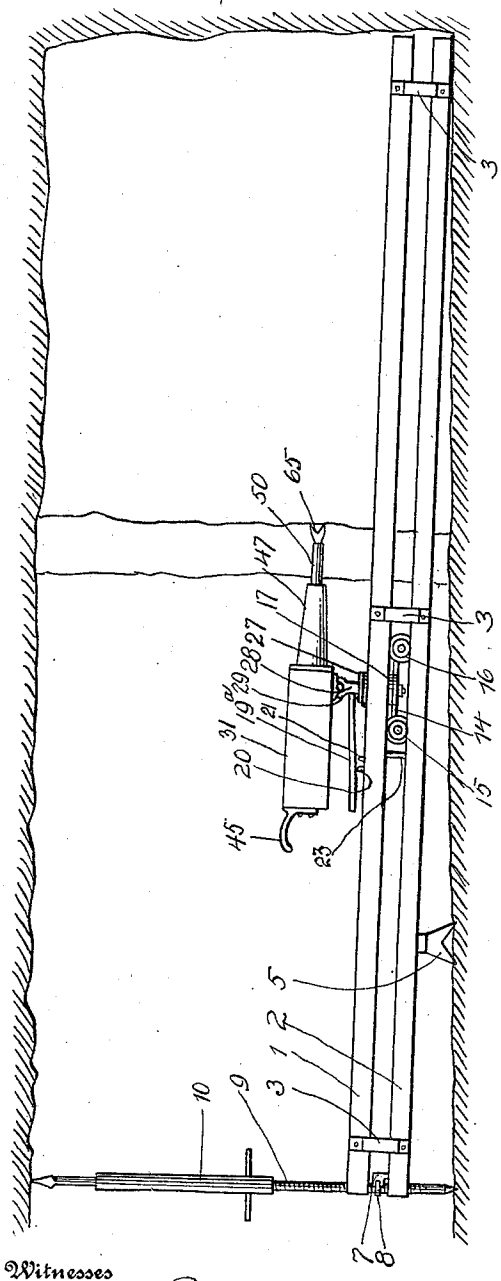
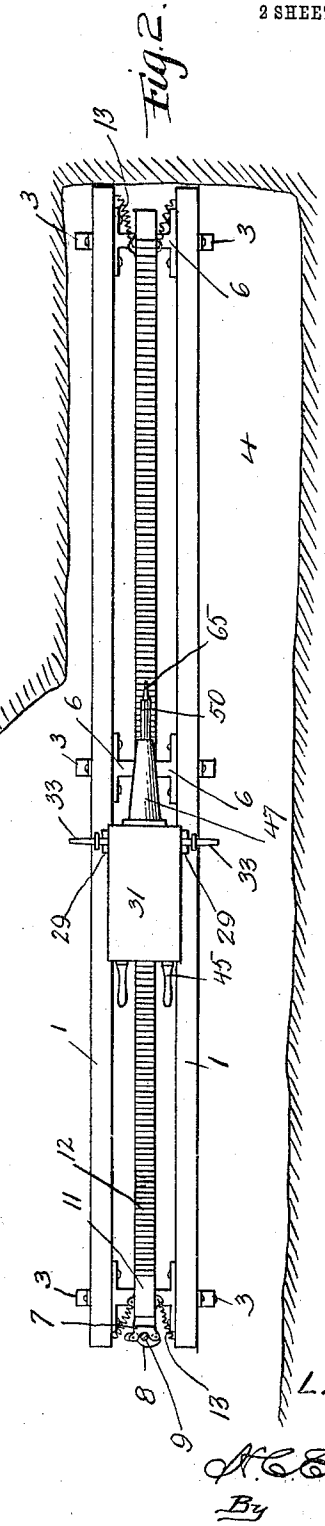


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

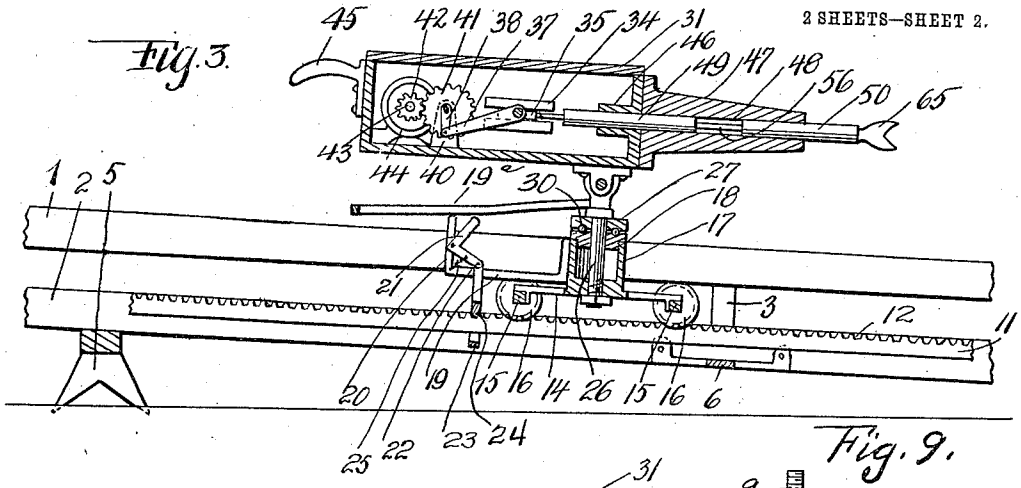


Fig. 9.

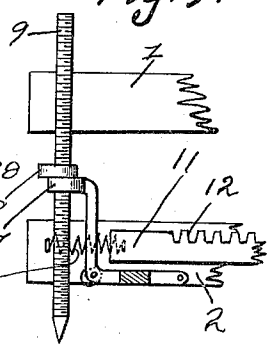


Fig. 4.

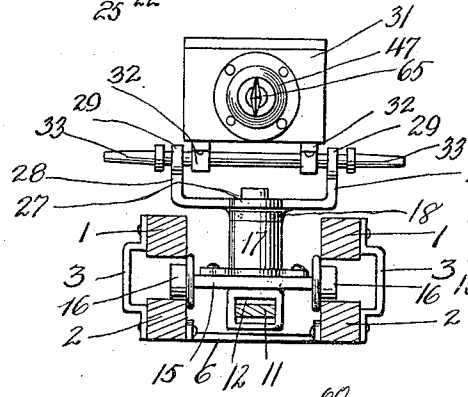


Fig. 5.

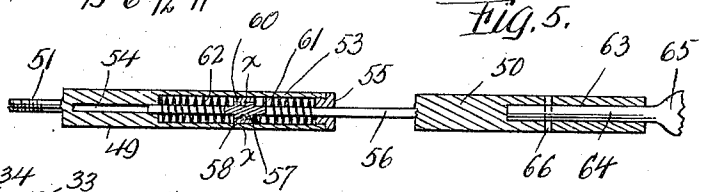


Fig. 6.

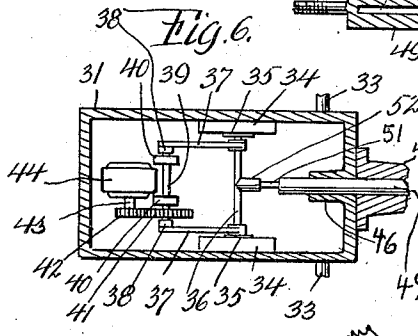


Fig. 8.

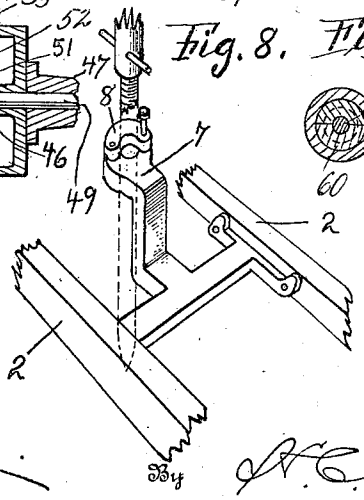
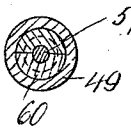


Fig. 7.



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UNITED STATES PATENT OFFICE.

LOTTE KOVATCH, OF OLIVEBURG, PENNSYLVANIA.

COAL-MINING MACHINE.

960,958. Specification of Letters Patent. Patented June 7, 1910.

Application filed August 12, 1909. Serial No. 512,540.

To all whom it may concern:

Be it known that I, LOTTE KOVATCH, a citizen of the United States of America, residing at Oliveburg, in the county of Jefferson and State of Pennsylvania, have invented certain new and useful Improvements in Coal-Mining Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to coal mining machines, and more particularly to that type of machine styled a "puncher" and used for digging and disintegrating coal.

The object of my invention is to provide a movable support for a coal punching machine and to adjustably arrange the machine relative to said support, whereby the machine can be tilted or swung in a lateral plane to operate upon coal located at the sides of the support.

Another object of this invention is to provide a longitudinal movable truck with a swivel adapted to support a tiltable coal punching machine.

A further object of the invention is to provide a machine of the above type that will be simple and durable in its construction, easy to operate and highly efficient for the purposes for which it is intended.

With the above and other objects in view, the invention consists in the novel construction, combination and arrangement of parts to be hereinafter described in detail and then claimed.

Reference will now be had to the drawings forming a part of this specification, wherein there is illustrated a preferred embodiment of the invention, but it must be understood that the structural elements thereof can be varied or changed, as to the shape, size and manner of construction without departing from the spirit of the invention.

In the drawings:—Figure 1 is a side elevation of my improved machine, Fig. 2 is a plan of the same, Fig. 3 is an enlarged longitudinal sectional view of a portion of the machine, Fig. 4 is a cross sectional view of the same, Fig. 5 is a longitudinal sectional view of a compensating device forming part of the machine, Fig. 6 is a horizontal sectional view of the body of the machine, Fig. 7 is an enlarged cross sectional view taken on the line X—X of Fig. 5. Fig. 8 is a view at one end of the tracks, illustrating the clamp for the brace at the rear end of the machine, and Fig. 9 is a view of a pair of bars at the rear end of the machine, the bars being broken away and further showing the brace and the clamp therefor at the rear end of the machine.

Referring to the drawings in detail two pairs of longitudinally-extending bars are provided, the bars of each pair being indicated by the reference characters 1 and 2, the bars of one pair are arranged opposite to the bars of the other pair and one pair of bars is spaced from the other pair. The lower bar of each pair which is indicated by the reference character 2 constitutes a track and the upper bar of each pair, which is indicated by the reference character 1, is arranged over the bar 2 and constitutes a stop. The bars of each pair are connected together by a series of vertically-disposed yoke-shaped straps whereby the bars of each pair are arranged in spaced relation. The bars 2 of the pairs are connected together by transversely-extending braces 6, one of the braces being disposed centrally with respect to the bars 2 and the other of the braces being arranged at the ends of the bars. The pairs of bars are adapted to be supported at an inclination in the room 4 of a mine by a trestle 5 which is arranged contiguous to the rear ends of said bars.

The transverse brace 6 at the rear end of the bars supports a pair of clamping members 7 and 8 which are arranged to clamp a brace for the rear ends of the bar. The brace comprises a screw-threaded member 9 and a turn buckle 10 engaging the member 9. The brace is interposed between the floor and roof of the room 4 and can be adjusted in accordance with the elevation of the rear ends of the bars, the elevation of the rear ends of said bars depending upon the location of the trestle 5.

Interposed between the bars 2 is a longitudinally-extending rail 11 provided with transversely-extending teeth 12. The rail 11 is of a length equal to the length of the bars 2 and has each end thereof connected to the ends of the bars 2 by coil springs 13, these latter compensating for the jarring and vibrating of the machine when in operation. Interposed between the pairs of bars is a

truck 14 mounted upon a pair of axles 15 provided with revoluble flanged wheels 16 riding upon the tracks formed by the bars 2 and not only having lateral movement arrested by the bars 2, but also by the bars 1, for the reason that the diameter of the flanges of the wheels 16 is such as to extend beyond the openings formed between bars 1 and bars 2. The truck 14 approximately centrally thereof has secured thereto a vertically-disposed tubular pedestal 17 having a detachable head 18 and a rearward extension 19 provided with an upright 20. Pivotally-connected to the upright 20, is a bell crank lever 21, having its lower arm pivotally-connected, as at 22, to a stirrup 23 which surrounds the rail 11 and is provided with a tooth 24 for engaging with the teeth 12. The stirrup is normally held in engagement with the teeth 12 of the rail 11, by a coil spring 25, which connects the lower arm of the bell crank lever 21 to the rear end of the upright 20. Extending through the pedestal 17 as well as the head 18 is a vertically-disposed revoluble shaft 26 having the upper end thereof provided with a head 27 and with oppositely disposed arms 28, the outer ends of said arms being bent upwardly and bifurcated, as at 29 to provide bearings for a purpose that will be hereinafter described.

30 denotes anti-friction balls arranged between the confronting faces of the heads 18 and 27, said balls revolving in annular races provided therefor in said heads, and these balls are adapted to reduce friction to a minimum when the shaft 26 is partially revolved.

19ª denotes a rearwardly extending frame carried by the arms 28, said frame forming a support for the rear end of the punching machine when the same is not in use.

31 denotes an oblong casing forming the body of the punching machine. The forward end of this casing is provided with depending bearings 32 for an axle 33, removably supported by the bifurcated upwardly bent ends of the arms 28. When the punching machine is not used in connection with my improved support, the spindles of the axle are provided with revoluble wheels, (not shown) whereby the punching machine can be moved from one part of the mine to another.

34 denotes oppositely disposed guide bars carried by the inner sides of the casing 31 and slidably mounted in said guide bars are slide heads 35 connected by a transverse rod 36. The rod 36 is connected by pitmen 37 to the cranks 38 of a shaft 39, said shaft being revolubly mounted in bearings 40, carried by the bottom of the casing 31. The shaft 39 is provided with a large gear wheel 41 and meshing with this gear wheel is a small gear wheel 42 mounted upon the armature shaft 43 of a motor 44 located in the casing 31. The motor 44 is of a conventional form commonly used in connection with mining machines, and is controlled through the medium of a suitable controller, (not shown) carried by the casing 31.

45 denotes rearwardly extending handles carried by the rear end of the casing 31, and these handles are adapted to be gripped to guide the punching machine and control the same, as will hereinafter appear.

The forward end of the casing 31 is provided with a central sleeve 46 and suitably attached to the forward end of said casing is a housing 47 having a longitudinal bore 48 communicating with the sleeve 46. Slidably mounted in the housing 48 and the sleeve 46 is a sectional plunger, the sections of said plunger being yieldably connected together. The rear section 49 serves functionally as a compensating device for the forward section 50 when in operation. The rear section 49 is provided with a reduced end 51 adapted to be connected to the rod 36, as at 52. The section 49 is provided with a longitudinal bore 53 having the rear end thereof reduced, as at 54, while the forward end of the bore 53 is closed by a head 55. Extending through the head 55 is a rod 56 carried by the section 50. This rod intermediate the ends thereof is provided with a head 57 having a circumferentially disposed groove 58. Adapted to engage the head 57 is a coupling member 60. Encircling the rod 56 between the head 55 and the head 57 is a coil spring 61, and encircling the rod between the rear end of the bore 53 and the head 57 is a coil spring 62. The coupling member 60 is employed whereby the springs 61 and 62 can be easily placed in the section 49. The section 50 is provided with a socket 63 for the shank 64 of a punching tool 65. The shank 64 is retained within the socket 63 by a detachable pin 66.

In the operation of my improved machine, the longitudinal frames 1 and 2 are placed at an inclination, whereby the punching machine will ride forward by gravity, and to hold the same in a fixed position upon the inclined frames, the stirrup 23 has been provided, which through the medium of the bell crank lever 21 and the spring 25 is normally retained in a locked position relative to the rack bar 11, and can be easily elevated by the lever 21 to permit of the truck 14 moving forward.

The operator of the machine can stand upon the frames 1, grip the handles 45, and swing the machine in a lateral plane or tilt the machine as occasion may require. The operator can also stand at either side of the frames with the punching machine swung around to operate upon a wall of coal at the sides of the frames. Where an undercut or kerf has been provided in a wall of coal, the forward end of the frames 1 and 2 can be

pushed into the undercut, whereby the punching machine can be operated in a direct line with the supporting frames.

With the motor 44 in operation, the sectional punch is reciprocated in the sleeve 46 and the housing 48 and the jarring and vibrating of the casing 31 is reduced to a minimum through the medium of the springs 61 and 62 arranged within the section 49.

Having now described my invention, what I claim as new, is:—

1. The combination with a mining machine having a reciprocating punch, of two pairs of inclined bars, the bars of one pair superposed with respect to and spaced from each other, a truck adapted to travel upon the lower bar of each pair, a rack bar yieldably supported by said bars, a pedestal carried by said truck, a revoluble vertical shaft carried by said pedestal and adapted to tiltably support said machine, an extension carried by said pedestal, and means supported by the rear end of said extension for gripping said rack bar to hold said truck fixed relative to said bar.

2. The combination with a mining machine having a reciprocating punch, and an axle adapted to support said machine, of inclined bars, a truck movably mounted upon two of said bars, a pedestal carried by said truck, a revoluble vertical shaft arranged in said pedestal and adapted to support the axle of said machine, an extension carried by said pedestal, an upright carried by said extension, a yieldable rack bar arranged between said bars, and a movable stirrup carried by said upright for gripping said rack bar to hold said truck fixed relative to said bar.

3. The combination with a mining machine, of inclined tracks, a truck adapted to travel upon said tracks and movably support said machine, a toothed element yieldably mounted between said tracks, an upright arranged at the rear end of said truck and movable therewith, and a stirrup movably supported by said upright and adapted to grip said toothed element to fix said truck relative to said element.

In testimony whereof I affix my signature in the presence of two witnesses.

LOTTE KOVATCH.

Witnesses:
LEWIS JAKUBEK,
J. L. THOMAS.