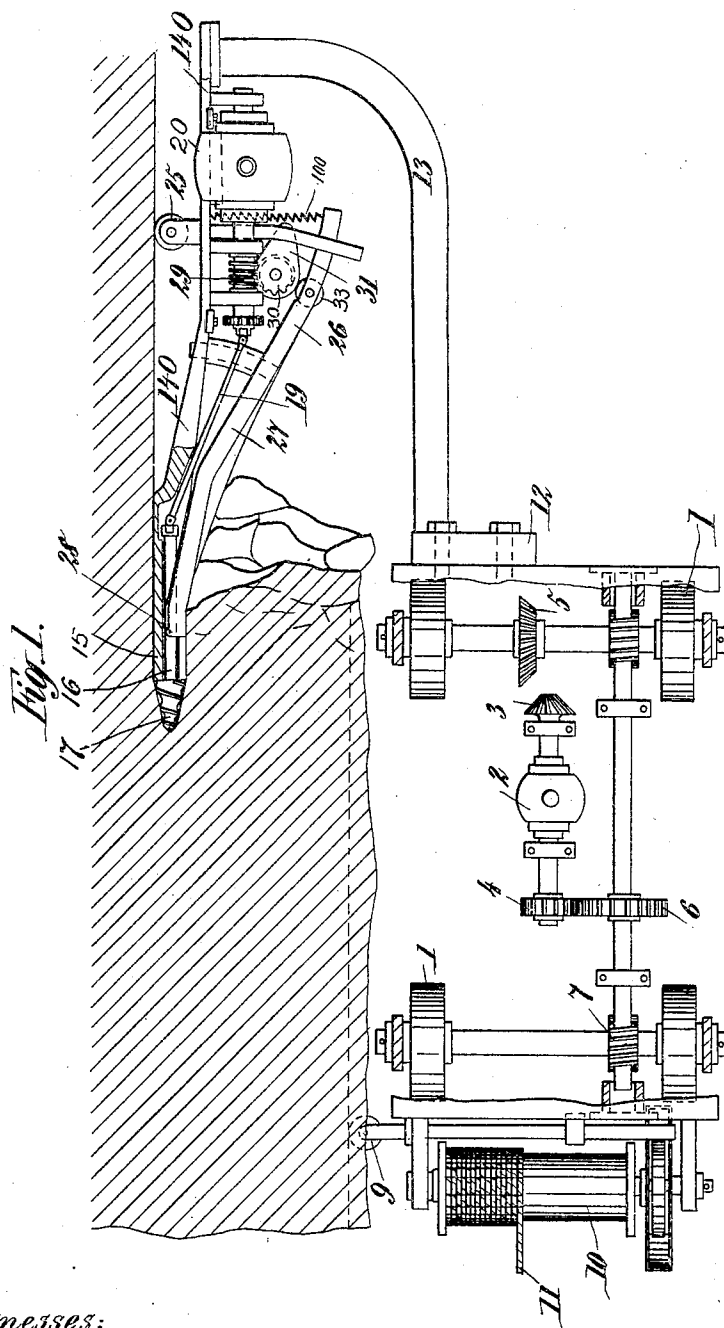


No. 809,350.

PATENTED JAN. 9, 1906.

G. WISSEMAN.
COAL MINING MACHINE.
APPLICATION FILED DEC. 15, 1902.

5 SHEETS—SHEET 1.



Witnesses:
Arthur J. Jumper.
Edward Ray

Inventor:
Conrad Wissemann
by his attorney
Frank R. Biers

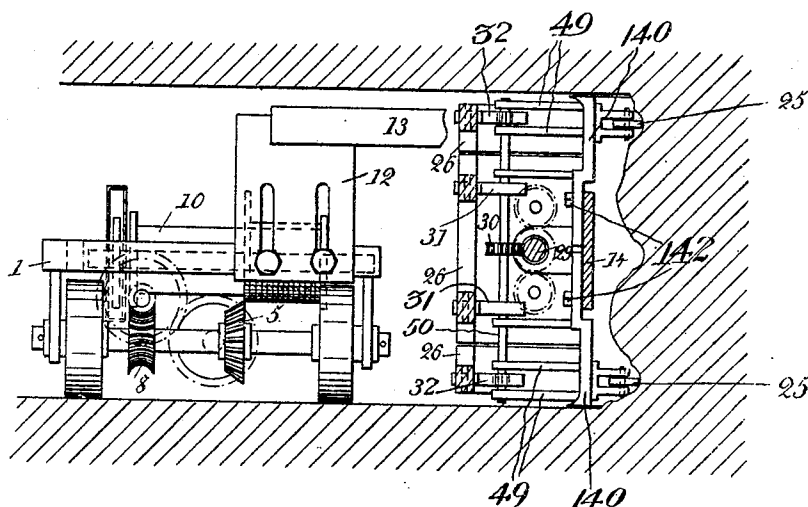
No. 809,350.

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C. WISSEMAN.
COAL MINING MACHINE.
APPLICATION FILED DEC. 16, 1902.

5 SHEETS—SHEET 2.

Fig. 2.



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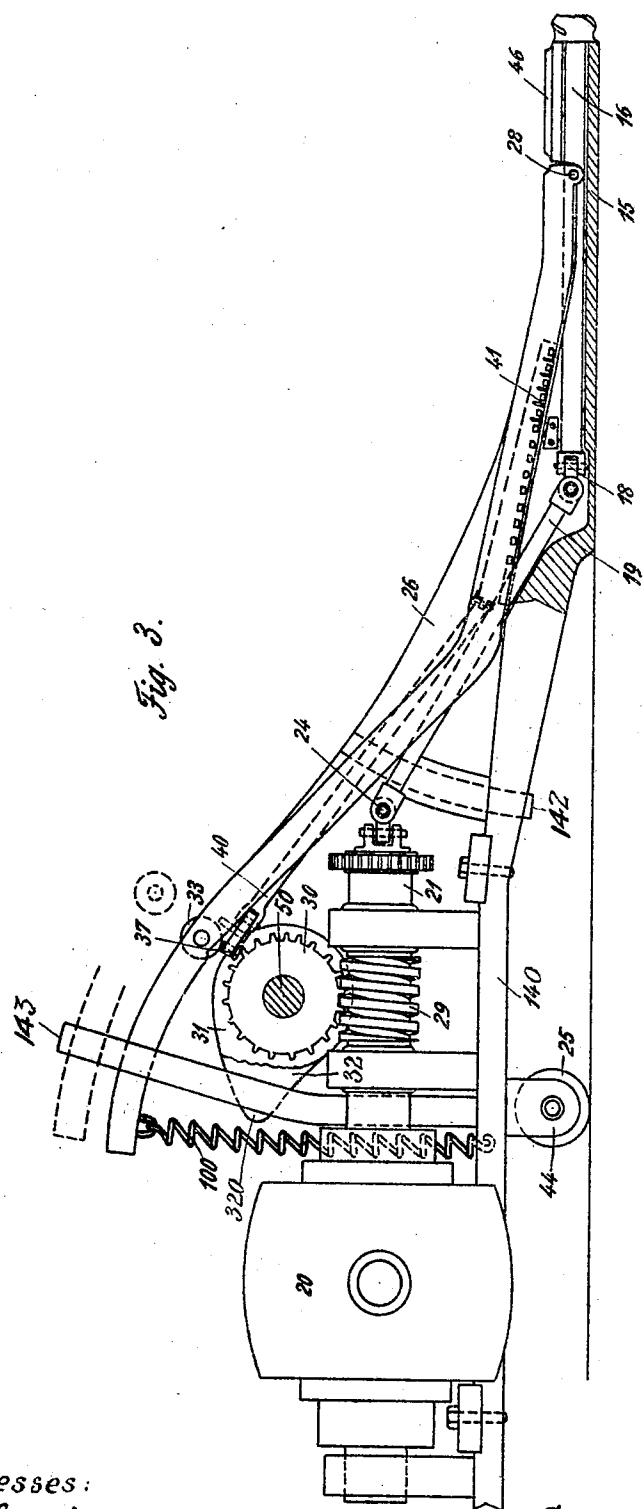
Conrad Wissemann
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Frankot Biegan

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5 SHEETS—SHEET 3.



Witnesses:
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Fred. Verfricht.

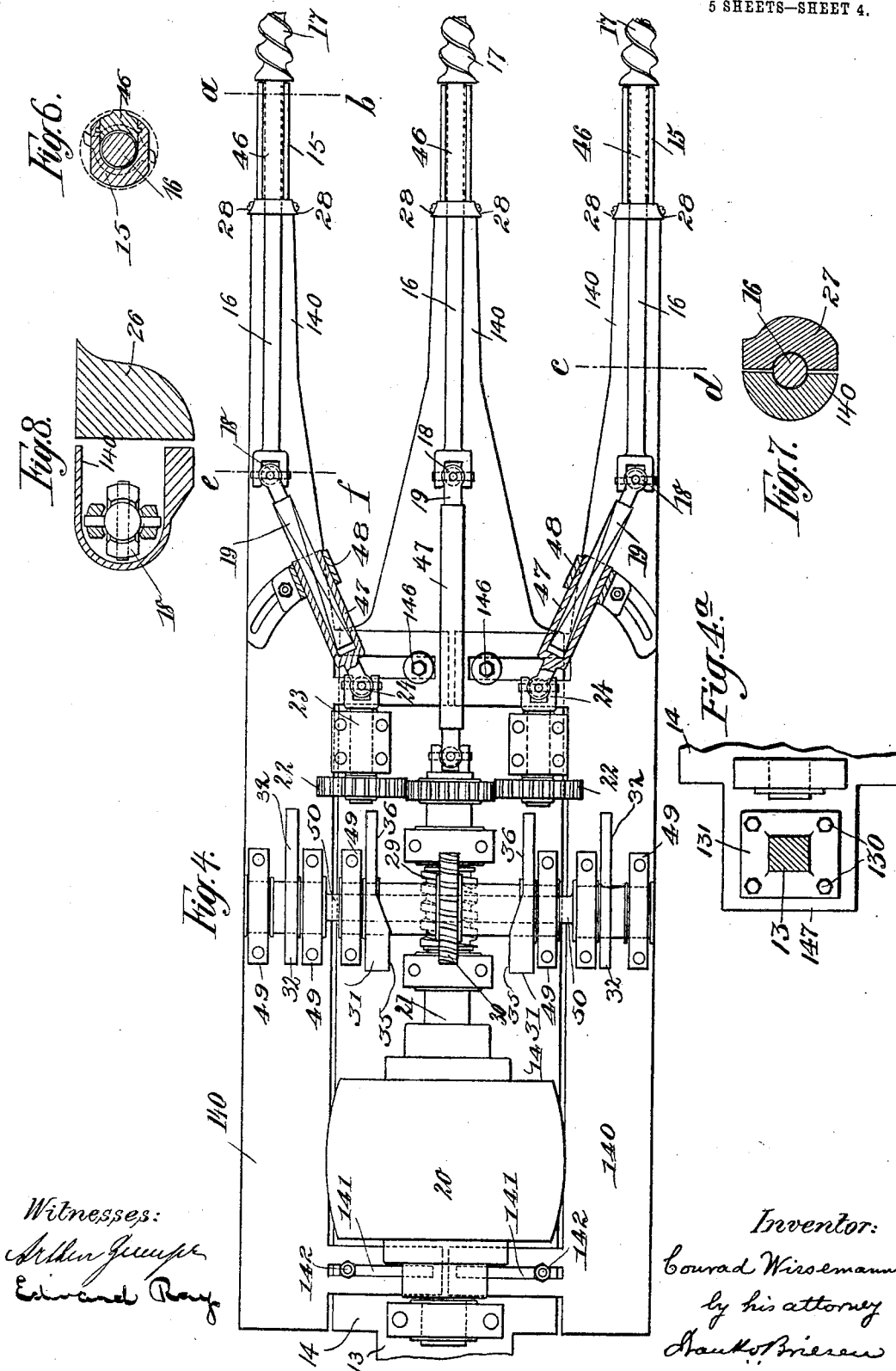
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5 SHEETS—SHEET 4.



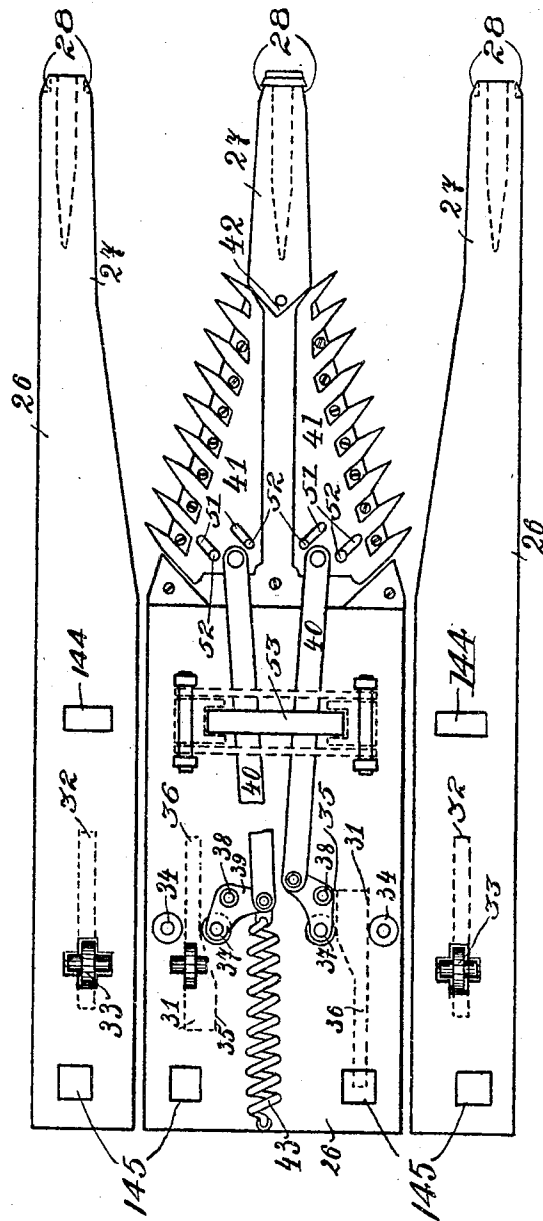
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APPLICATION FILED DEC. 15, 1902.

5 SHEETS—SHEET 5.

Fig. 5.



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UNITED STATES PATENT OFFICE.

CONRAD WISSEMAN, OF GELSENKIRCHEN, GERMANY.

COAL-MINING MACHINE.

No. 809,350.

Specification of Letters Patent.

Patented Jan. 9, 1906.

Application filed December 15, 1902. Serial No. 135,200.

To all whom it may concern:

Be it known that I, CONRAD WISSEMAN, a subject of the King of Prussia, German Emperor, residing at Gelsenkirchen, Kingdom of Prussia, German Empire, have invented new and useful Improvements in Coal-Mining Machines, of which the following is a specification.

In United States Patent No. 701,979, of June 10, 1902, granted to me and relating to "machines for extracting coal in pieces from the mines," I have described a machine where the stratum of coal is severed off by means of a circular saw. This machine, however, is not very well adapted for hard coal generally.

My present invention is intended to provide a machine fitted with boring devices and suitable for the breaking of hard coal, anthracite, and the like.

The cutting off from the rear of the stratum or layer of coal is effected in my present invention by driving a series of boring-holes arranged vertically one underneath the other and into which suitably-shaped steel heads, which are enlarged at their rear ends, are introduced, which break the coal to pieces.

In the accompanying drawings, Figure 1 is a plan view, partly in section, of my improved coal-mining machine; Fig. 2, a rear elevation of the machine; Fig. 3, a plan view of the entire working mechanism, on an enlarged scale, with some of the parts omitted; Fig. 4, a side view of the entire arrangement of the boring devices with the covers removed; Fig. 4^a, a detail side view, partly in section, of part of the supporting-plate and arm; Fig. 5, a side view of the operating parts effecting the breaking away of the coal from the inside of the boring-holes with some of the parts omitted; Fig. 6, an enlarged cross-section on line *a b*, Fig. 4; Fig. 7, a similar cross-section on line *c d*, Fig. 4, showing the oscillating plate in position; and Fig. 8, a similar cross-section on line *e f*, Fig. 4, showing the oscillating plate in position.

The general construction and arrangement of my machine is similar to that disclosed in my previous United States Patent No. 701,979. The axles of the car 1 are rotated from the motor-engine 2 by means of gears 3 and 4, and gear-wheels 5, 6, 7, and 8, respectively, are guided in a direction parallel to the impact in a suitably-bored groove by means

of the laterally-displaceable roller 9. The car is provided with the drum 10, on which the feed-wires 11 for the electric current for the motor-engines are automatically wound up. The other end of the car is provided with a displaceable plate 12, on which is mounted one end of an arm 13, which extends laterally above the car. The other end of arm 13 is provided with a base-plate 131, which by screws 130 is secured to an extension 147 of a base-plate 14, on which the instruments are supported.

The boring devices, of which three have been shown in the drawings arranged one underneath the other, but the number of which may of course be larger or smaller, are mounted in a peculiar manner on the vertical plate 14. To the latter are bolted two vertically-adjustable end plates 140, arranged in alinement with plate 14. Plates 14 140 140 are provided at their forward ends 15 with longitudinal semicircular guide-grooves, which are covered near their front ends by caps 46, so as to form tubular guides for the steel tools or drills 16, the front ends of which are provided with bits 17. The caps 46 may be held in position by a suitable groove-and-feather connection. The distance between the bits is adjustable to adapt the machine for mining coal of different degrees of hardness. For this purpose plates 140 are provided with slots 141 148 for the passage of clamp-screws 142 146, respectively, of plate 14.

The drills 16 are attached at their rear ends by means of cross or wabble joints 18 to special shafts 19 190. The shaft 19 of the central drill 16 is by a universal joint 240 connected to shaft 21 of the electromotor 20. The shafts 190 of the upper and lower drills 16 are of square form in cross-section and are telescoped by the correspondingly-bored hollow shafts 47, so as to permit the distance between the bits to be readily adjusted. The shafts 47 are rotatably mounted in bearings 48 of plates 140, which are adjustable according to the inclination of shafts 19 47, such inclination varying with the distance between the bits.

For operating the device I use the electromotor-engine 20, supported on the plate 14. The shaft 21 of the said electromotor-engine is extended at the front end of the machine and is in direct engagement with the middle

boring device, and by means of the pinions 22 it imparts movement to the counter-shafts 23, which are connected by swivel, cross, or wobble joints 24 to the shafts 47 19, which, as already explained, operate the bits 17 by means of swivel or wobble joints 18. The plate 14 is guided by the wheels 25, Fig. 2, journaled in bearings 44 of plates 140.

The motor-engine 20 is not only intended to operate the borers, but it also operates the device for the breaking away of the coal from the inside of the bore-holes. Said device consists of a plate 26, composed of three parts, which is represented in Fig. 5 of the drawings, and the connections of which with the boring devices will be apparent from Fig. 3. The three parts of plate 26 may be so connected as to permit a lateral adjustment corresponding to the distance between the bits. The shape of the plate 26 corresponds to that of the plate 14, the plate 26 being provided with forwardly-extending arms 27, equal in number to that of the tool-holders of the plate 14. These arms 27 are longitudinally grooved at their forward ends, so as to partially embrace the rods of the borers at their front ends. The arms 27 are pivotally attached at 28 to the arms of the plates 14 140, so as to be capable of rather vigorous oscillation on their pivots for the breaking loose of the coal. During said oscillation the plates 26 are guided by curved or inclined guides 142 143 of plates 14 140. These guides pass through corresponding openings 144 145, respectively, of plates 26, Figs. 3 and 5. With this end in view I provide a worm 29 on the motor-shaft 21, the said worm engaging with a worm-wheel 30, suitably mounted at the side thereof. To the shaft 50 of the said worm-wheel, mounted in bearings 49, are keyed two pairs of cam-disks 31 32. The inner faces of disks 31 have projections 35 and receding sections 36 and serve to impart motion to the saw-like cutters 41 in manner hereinafter described. The peripheries of disks 32 are engaged by cam-rollers 33, mounted in recesses of plate 26. These rollers are forced against the disks 32 by a spring 100, suspended between plates 26 and 14. The pointed peripheral part 320 of cam-disk 32 forces the rear end of the plate 26 laterally inward at every revolution of such disk, thereby causing the coal to break loose, this inward movement of the plate being immediately followed by the withdrawing of the same by means of the spring. The oscillation of the plate is indicated by dotted lines in Fig. 3 of the drawings. In order to be able to also remove the block of coal remaining between the bore-holes upon the pushing forward of the device, the crushing-plate or push-plate 26 is further provided with the attachment best shown in Fig. 5 of the drawings. The two center cam-disks 31 31 serve, as above stated,

to actuate the cutters 41, mounted upon plate 26, and are operated in the following manner: The inner faces 35 36 of said disks are engaged by rollers 37 of elbow-levers 39, fulcrumed at 38 to plate 26. To the other arms of levers 39 are pivoted links 40, which pass freely through a suitable guide 53 and are pivoted to serrated knife-plates or cutters 41. These cutters are guided upon plate 26 by pins 52, engaging inclined slots 51 of the cutters. Springs 43, interposed between levers 39 and plate 26, (of which but one is shown in the drawings for the sake of greater clearness,) press rollers 37 against cam-disks 31, the pressure upon said disks being counterbalanced by guide-rollers 34, so as to avoid vertical displacement of the same. In front of the said plates 41 a wedge 42 is fastened to the plate 26. If by the rocking of the elbow-levers and the corresponding movement of the push-rods the knife-plates 41 are pushed forward, the knife-plates are forced to the outside by the wedge 42, as shown in Fig. 5. The shape of the inner faces of cams 31 is such that the outward movement of the cutters 41 commences before the plate 26 is pushed inward by the peripheral cams 32. During the following inward movement of plate 26 the cutters 41 continue to move outward, and as soon as the plate 26 swings back the cam-rollers 37 will engage the reduced section 36 of cams 31 to permit the return movement of the elbow-lever 39, which causes the knife-plates to reassume their original position, the push-rods being withdrawn by the action of the spiral springs 43. The operation of this part of the device is effected as follows: When the work is commenced, the bits of the borers are parallel to the joint of the layer of coal. The bits are operated by the motor-engine 20, and when set in motion they are fed forward with the car 1, the motor-engine 2 of which is also started. Along with the guides 15 46 of the bits the front parts of the plate 26 are also introduced into the bore-holes, and by means of their vigorous very powerful oscillations they effect the breaking loose of the coal, the pointed knives on the middle part of the plate serving at the same time to shear off the coal between the bore-holes.

What I claim is—

1. In a coal-mining machine, the combination of a motor-engine, with a series of borers arranged vertically one below the other and acting to drive holes parallel to the joints of the layers of coal, plates acting in the manner of wedges, the front ends of which enter the bore-holes, and means to rock said plate on a pivot at their forward ends.

2. A coal-mining machine comprising in combination a series of several borers arranged vertically one below the other, a crushing-plate and a motor-engine operating the borers and connection of said motor-en-

gine with a cam-disk at the rear end of the crushing-plate and serving to impart oscillating movement to said crushing-plate.

3. A coal-mining machine comprising in
5 combination a series of several levers arranged vertically one below the other and a crushing-plate acting like a wedge, and means to impart a continuous rocking movement to the rear end of said plate, a frame or scaffold,
10 borers supported thereby, a motor-engine mounted upon the plate, a car supporting the frame or scaffold and continuously feeding the entire mechanism by the action of the motor-engine.

15 4. In a coal-mining machine, the combination of a series of borers arranged vertically one below the other, with a crushing-plate acting like a wedge and entering the bore-holes at its front end, means to rock the rear
20 end of said plate, the middle section of said plate being provided with movable knife-plates, and with means for moving said knife-plates.

5. A coal-mining machine comprising in
25 combination a series of several borers arranged vertically one below the other, and a crushing-plate having a wedge-like action,

movable knife-plates on said crushing-plate, means for operating the crushing-plate, and means for operating the knife-plates. 30

6. In a coal-mining machine, the combination of a car with a series of rotatable drills arranged above one another, and means for simultaneously breaking the coal at the side of the drills, substantially as specified. 35

7. In a coal-mining machine, the combination of a car with a series of rotatable drills arranged above one another, a pivoted push-plate, and means for oscillating said plate in a lateral direction, substantially as specified. 40

8. In a coal-mining machine, the combination of a car with a series of rotatable drills arranged above one another, a pivoted laterally-oscillating push-plate, cutters slidable upon said plate, and means for operating said
45 cutters, substantially as specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

CONRAD WISSEMAN.

Witnesses:

PETER LIEBER,
WILLIAM ESSENWEIN.