Sept. 18, 1928. 1,684,943

F. CARTLIDGE

MINING MACHINE

Original Filed June 21, 1918

Fig. 1.

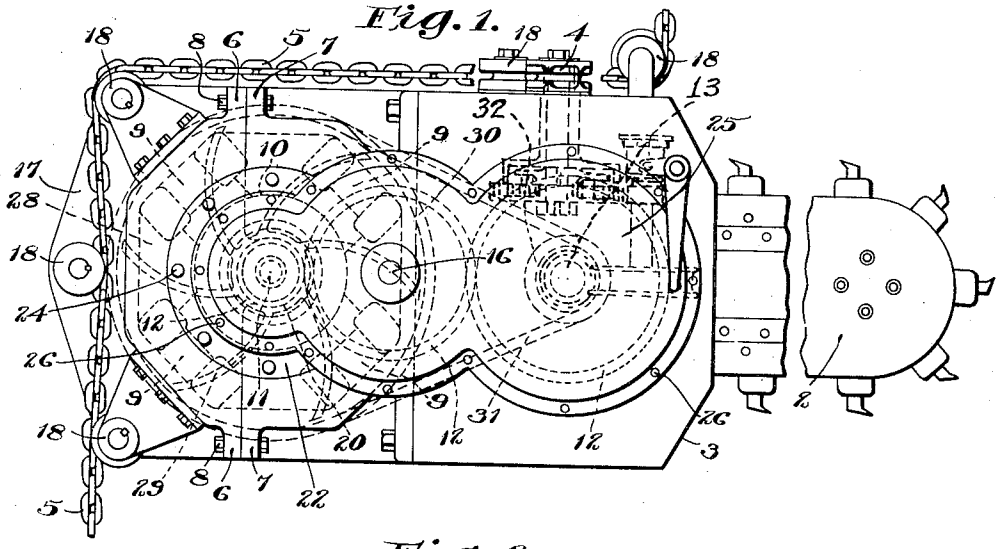
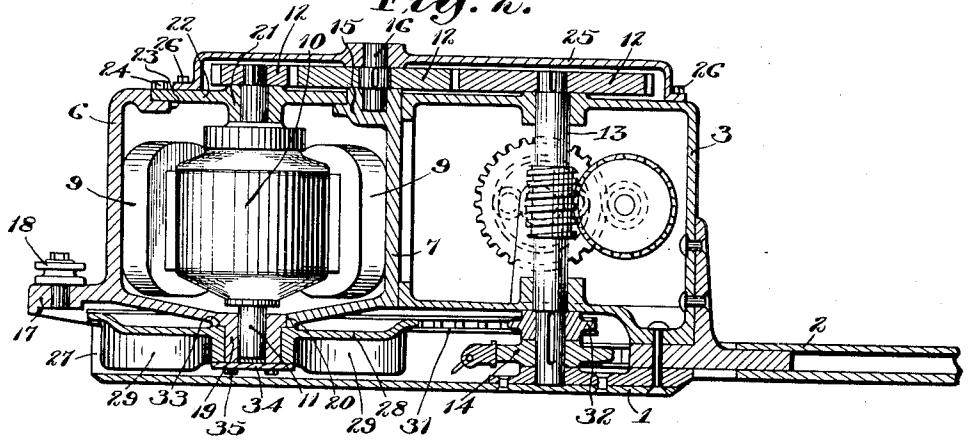


Fig. 2.



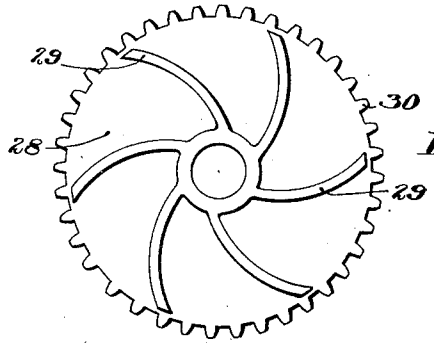


Fig. 3.

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UNITED STATES PATENT OFFICE.

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MINING MACHINE.

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My invention relates to mining machines.

It has for its object to provide an improved mining machine and more particularly an improved machine of the flexibly fed type especially adapted to low vein work. Another object of my invention is to provide an improved machine, and herein more particularly a room and pillar machine having improved feeding and cutting means and an improved arrangement and construction of the feeding and cutting means and the motor whereby a construction is produced especially adapted to use in low vein work. It also has among its objects to provide an improved mining machine construction wherein the rotor of the driving motor may be removed with great facility, and more particularly a construction especially adapted to low vein work wherein while an exceedingly compact construction vertically is maintained, the motor rotor may be removed laterally in a path substantially within the vertical limits of the machine frame. A further object of my invention is to provide an improved construction especially adapted to use in connection with low vein machines whereby the well known advantages in the way of simplification of gearing arising from the use of a vertical motor may be obtained and the motor armature at the same time may be conveniently removed without lifting the same through the top of the machine frame. Another object of my invention is to provide improved means for distributing the mining machine cuttings in such a manner as to minimize the difficulty with clogging. A still further object of my invention is to provide improved cuttings expulsion means cooperating with a vertical motor and the cutter chain, and likewise preferably readily removable, whereby the cuttings are expelled from the machine frame without clogging despite the location of one of the armature journals in the path of the cuttings. These and other objects of my invention will, however, hereinafter more fully appear.

In the accompanying drawings I have shown for purposes of illustration one embodiment which my invention may assume in practice.

In these drawings,—

Fig. 1 is a plan view of a machine equipped with my improvement.

Fig. 2 is a central longitudinal sectional view of a portion of the same.

Fig. 3 is a detail plan view of the cuttings-expulsion member.

In this illustrative construction, it will be observed that the room and pillar machine shown is slidable over the mine bottom on a sub-frame or shoe 1, and has a cutter bar 2 rigidly connected thereto, and also a front upper or feed and cutter frame section 3 in which, as usual, may be housed the feed driving mechanism adapted to rotate a feed operating member, herein in the form of a sprocket 4, rotatable on a transverse axis near the front end of the frame 3 and on the advancing side of the latter and thus provide power to feed the machine relative to flexible feeding means having advance and receding flexible feeding portions, herein in the form of a chain 5, when said flexible feeding means is connected for any of the well known feeding operations of such a machine. Herein, the feed driving mechanism is of the type described in the Noble Patent 1,019,722, patented March 5, 1912, and accordingly need not be described other than to say that it is driven from the shaft 13 and is operable to rotate the member 4 at a predetermined slow or cutting speed to draw in the advance portion of the flexible feeding member while the receding portion acting on the opposite end of the machine frame is lengthened.

In my improved construction it will be observed that the motor frame section shown herein as dust-proof, is located over the rear end of the shoe and vertically divided transversely into two parts 6 and 7, bolted together by bolts 8 and each carrying a part of the field 9 for a vertically disposed armature or rotor 10. As shown herein, the shaft 11 of this armature is rotatably connected through a train of spur gearing 12 to a vertical shaft 13 journaled in the front frame 3, which shaft, in turn, may form a part of the feeding mechanism, and herein preferably also has a cutter chain rotating sprocket 14 rotatably connected to its lower end. In my improved construction the part 7 carries two poles and is rigidly connected in any suitable manner to the rear end of the frame 3. It will be noted that this part is also provided with a suitable journal 15 adapted to receive a stud 16 on which one of the gears in the gear train 12

is fixed. The other part 6 of the motor frame preferably carries the remaining holes and also preferably carries a rearwardly projecting extension 17 carrying three rear idlers of a series of idlers 18 cooperating with the feed chain 5, certain of the other idlers of this series being carried on the front frame section 3 and disposed adjacent the feed operating member 4 while one is disposed in advance of the latter and rotatable on an upright axis at the front corner of the advancing side of the machine. As shown herein, the head portion of this part 6 is also provided with an axially disposed bearing member 19 adapted to be received in a corresponding socket 20 in the head member on the part 7 and adapted to receive and form a bearing for the lower end of the armature shaft 11. Here it will also be noted that the upper end of this shaft is also journaled in a suitable bearing 21 formed in a suitable removable cover plate 22 which is in turn disposed in a bored out and preferably flanged enlarged coaxially disposed opening 23 formed conjointly in the two members 6 and 7. Attention is here also directed to the fact that the plate 22 is attached to the elements 6 and 7 by bolts 24, and that the gear train 12 is covered by a suitable cover 25 attached to the members 3 and 22, as for instance by means of bolts 26.

In the use of a construction wherein the cutter chain driving sprocket is located at the front of the frame and in front of the motor in such a manner as to produce a vertically compact construction; it is also desirable to provide means for insuring egress of the cuttings which might otherwise clog the machine, and preferably to provide means for insuring the discharge of the cuttings from a point within the frame where they are delivered by the cutter chain, such a construction being especially desirable where, as in the present instance, in order to produce a low machine adapted to low vein work a part of the motor, herein, the lower armature bearing, is disposed in rear of the chain driving sprocket, herein between the latter and the rear cuttings outlet 27. These means also act to distribute the cuttings as the machine moves and herein are in the form of a rotatable cutting-expulsion member 28, preferably having curved blades or vanes 29 thereon, which is suitably operatively connected to a moving part of the machine and preferably relatively slowly rotated thereby in such a manner as to minimize the creation of dust while yet throwing the cuttings a substantial distance in rear of the machine. More particularly, it will be noted that this member 28 is provided on its upper end with a sprocket 30 which is, in turn, operatively connected, through a chain 31, to another sprocket 32 carried on the shaft 13, and that this driving connection is disposed well above the plane of movement of the cutter chain in such a manner as to minimize the obstruction of the free backward movement of cuttings. As shown, this member 28 is also journaled on the outside of the bearing member 19. It will also be noted that this member 28 is retained in suitable relation with respect to an upper bearing flange 33 on the bearing member 19 by a retaining and cuttings excluding bottom plate 34, herein bolted to the member 19 by suitable bolts 35.

In my improved construction it will be noted that when it is desired to remove the motor armature 10 while working on a low vein, i. e., where there is little space between the top of the machine and the roof, it is only necessary to remove the cover 25, the bolts 24, and the bolts 8 holding the rear part 6 of the motor casing in place, and after the chain 31 has been disconnected pull that part laterally, herein rearwardly, in order to render the motor armature accessible, the latter moving bodily rearward with the element 6 and being separable therefrom by simply removing the cover plate 22. It will also be noted that access may be had in the same manner to the cuttings-expulsion member 28 and the lower motor bearings, the members 6 and 28 being adapted to be withdrawn as a unit. Moreover, it will be noted that when operating under other conditions, as for instance where there is a sufficiently high roof, the motor armature 10, if desired, may be lifted out by simply removing the cover plates 25 and 22.

By the use of my improved construction, it will be noted that a low construction especially adapted to low vein work is provided, the disposition of the feed operating member on a transverse axis in front of the motor and the termination of the cutter bar in front of the motor enabling the height of the machine to be determined practically by the height of the motor. At the same time it will be noted that the arrangement, which I have provided, of the feed operating member, the guide for the flexible feeding member, and the cutter chain sprocket relative to one another and the motor, enables the feed operating member to be located advantageously, herein on the advancing side of the machine, in a position enabling it to cooperate with a guiding means, such as the guide 18 on the advancing side of the machine, in such a manner as, while retaining the greatest simplicity, a minimum of bends in the flexible feeding member and a maximum effective length of the bar, to cause the advance portion to be so disposed parallel to and closely adjacent to the face as to act from the most advantageous point on the machine, i. e. in a plane parallel to and adjacent to the face and substantially including the point where the bar projects from the machine. Also, it will be noted that while these

advantages are obtained, the opposite end of the machine is maintained in proper relation to the face by cooperating guiding means in addition to the member 18 but also acting on the flexible feeding means, and that all necessity for providing control means for these means located adjacent the feed operating member or even on the same end of the machine carrying the latter, or of providing any such separate means, is eliminated. Moreover, it will be noted that by this arrangement it is made possible to locate the motor at an end and a freely accessible end, herein the rear end of the machine in such a manner as not only to enable the height of the motor per se to determine the height of the machine but to make it readily accessible from the end of the machine, an especially valuable feature in low vein work having the advantage of enabling the motor armature to be removed with facility even when the machine is operating at the face in very low coal. Further, it will be noted that it is made possible to eliminate the difficulties with removing the armature of a vertically disposed motor in low vein work and thus make it possible in this work to utilize a vertical motor and thereby take advantage of the simplification of gearing obtainable from the use of such a motor. At the same time, it will be observed that an improved and simplified construction is provided and one which, while adapted to use in narrow vein work, is also adapted to use in wide seam rooms or entries where there is ample space to permit the armature to be lifted out. Through the provision of my improved slack distributing or shoveling means, it will also be evident that it is possible to eliminate the necessity for shoveling on the part of an operator's helper while the machine is in operation, the blades or vanes provided acting to shovel the cuttings over the rear end of the shoe and thus distribute them over the bottom in rear of the machine. Here, attention is also directed to the fact that I have herein provided improved means housed within the frame for feeding the cuttings which, while adapted to use in any construction wherein the cutter chain driving sprocket is located in front of the same or at the front of the machine as herein, has a distinct function in such a low vein construction as that disclosed, wherein a part of the motor is desirably located as low as possible and in the path of the cuttings. These and other advantages of my improved construction will, however, be clearly apparent to those skilled in the art.

While I have in this application specifically described one embodiment which my invention may assume in practice, it will be understood that this form of the same is used for purposes of illustration only, and that the invention may be modified and embodied in various other forms and adapted to other forms of mining machines than room and pillar machines or other forms than those utilizing a continuous flexible feeding member without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a mining machine, a frame, cutting mechanism thereon including a cutter bar, a vertical motor operatively connected to said cutting mechanism, and means whereby the motor armature may be removed laterally.

2. In a mining machine, a frame, cutting mechanism thereon including a cutter bar, a vertical motor operatively connected to said cutter bar, and means whereby the armature of said motor may be withdrawn rearwardly.

3. In a mining machine, a frame, cutting mechanism thereon including a cutter bar, a vertical motor operatively connected to said cutter bar, and means including a plural-part motor casing whereby the motor armature may be withdrawn laterally.

4. In a mining machine, a frame, cutting mechanism thereon including a cutter bar, a vertically disposed motor operatively connected to said cutting mechanism, and means whereby the motor rotor may be withdrawn laterally including a vertically divided separable casing enclosing said rotor.

5. In a mining machine, a frame, cutting mechanism thereon including a cutter bar, a vertical motor operatively connected to said cutting mechanism, and laterally removable means providing journals for the opposite ends of the motor armature and bodying removable therewith.

6. In a mining machine, a frame, cutting mechanism thereon including a cutter bar, a vertically disposed motor operatively connected to said cutting mechanism, and a plural-part casing enclosing said motor and having a laterally removable part for rendering laterally removable the armature of the latter.

7. In a mining machine, a frame having a shoe on which said machine is supported, cutting mechanism thereon including a cutter bar and a cutter chain movable around the same, a vertically disposed motor operatively connected to said cutter chain, and cuttings-expulsion mechanism operatively connected to said motor and located above said shoe and in the rear of said cutting mechanism.

8. A room and pillar mining machine adapted to be fed laterally relative to the coal face during the cutting operation comprising a machine frame having a cuttings channel extending longitudinally thereof beneath the same, cutting mechanism including a cutter chain carrying bar having its chain extending into and delivering cuttings into said channel, and cuttings distributing means driven by said machine and operatively con-

nected thereto within the rear end of said channel for discharging the cuttings rearwardly from the machine as the latter moves laterally.

9. A room and pillar mining machine adapted to be fed laterally relative to the coal face during the cutting operation comprising a machine frame having a cuttings channel extending longitudinally thereof beneath the same, cutting mechanism including a cutter chain carrying bar having its chain extending into and delivering cuttings into said channel, and cuttings distributing means substantially completely housed in and adjacent the rear end of said channel for discharging the cuttings rearwardly from the machine as the latter moves laterally.

10. The combination with a mining machine comprising a feed and cutter frame slidable laterally along a face externally thereto during cutting and feeding and cutting mechanisms thereon, of power driven cuttings distributing means disposed substantially within the limits of said frame for discharging the cuttings rearwardly from the machine as the latter moves laterally.

11. The combination with a mining machine comprising a feed and cutter frame slidable along a face externally thereto during cutting and feeding and cutting mechanisms thereon, of power driven cuttings distributing means receiving cuttings from said cutting mechanism and disposed substantially within the rearmost limit of said frame as it moves along a face.

12. The combination with a mining machine comprising a feed and cutter frame slidable along a face externally thereto during cutting and feeding and cutting mechanisms thereon, of power driven cuttings distributing means receiving cuttings from said cutting mechanism and disposed in alinement with said frame and within the rearmost limit thereof as it moves along a face.

13. The combination with a mining machine comprising a feed and cutter frame slidable along a face externally thereto during cutting and feeding and cutting mechanisms thereon including a cutter driving sprocket at one end of said frame, and power driven cuttings shoveling means disposed adjacent said sprocket and within the rearmost limit of said frame as it moves along a face.

14. In a mining machine, a frame, cutting mechanism thereon including a cutter bar and a cutter chain movable thereon, a vertically disposed motor operatively connected to said cutter chain, and a cutting-expulsion member coaxially disposed with said motor and operatively connected thereto and disposed in rear of said cutting mechanism.

15. In a mining machine, a frame, cutting mechanism thereon including a cutter bar and a cutter chain movable thereon, a vertically disposed motor operatively connected to said cutter chain, and a cuttings-expulsion member coaxially disposed relative to said motor and operatively connected to said cutting mechanism and disposed in rear thereof.

16. In a mining machine, a frame, cutting mechanism thereon including a cutter bar and a cutter chain movable thereon, a vertically disposed motor operatively connected to said cutter chain, and a cuttings-expulsion member coaxially disposed relative to said motor and operatively connected to said cutting mechanism, the operative connections being disposed in a plane above the plane of said bar.

17. The combination with a mining machine comprising a feed and cutter frame disposed externally to a mine face during cutting and slidable therealong carrying lateral feeding and cutting mechanisms thereon and a motor operatively connected thereto of cuttings distributing means driven by said motor and disposed externally of the face substantially within the rearmost limit of said frame as it moves along the face.

18. The combination with a mining machine comprising a feed and cutter frame disposed externally to a mine face during cutting and slidable therealong carrying lateral feeding and cutting mechanism thereon and a motor operatively connected thereto through driving mechanism, of cuttings distributing means driven from said driving mechanism and disposed externally of the face substantially within the rearmost limit of said frame as it moves along a face.

19. The combination with a mining machine comprising a feed and cutter frame disposed externally to a mine face during cutting and slidable therealong carrying feeding and cutting mechanism thereon and a motor operatively connected thereto through driving mechanism including a speed reducing mechanism, of cuttings distributing means driven by said motor through said reducing mechanism and disposed externally to a face substantially within the rearmost limit of said frame as it moves along a face.

20. In a mining machine, a frame, cutting mechanism thereon including a cutter bar, a vertically disposed motor operatively connected to said cutting mechanism, and a plural-part motor field casing having one of its parts laterally removable to permit lateral withdrawal of the motor armature.

21. In a mining machine, a frame, cutting mechanism thereon including a cutter bar, a vertically disposed motor operatively connected to said cutting mechanism, and a plural-part motor field casing having one of its parts laterally removable with the motor armature.

22. In a mining machine, a frame, cutting mechanism thereon including a cutter bar, a vertically disposed motor operatively connected to said cutting mechanism, and means

whereby said motor armature may be withdrawn vertically from said motor casing or laterally at will.

23. In a mining machine, a frame, cutting mechanism thereon including a cutter bar, a vertically disposed motor operatively connected to said cutting mechanism, and a motor casing having a laterally removable section having a length substantially equal to the length of the motor and a vertically removable cover plate.

24. In a mining machine, a frame, a cutting mechanism thereon including a cutter bar, and a vertically disposed motor having a rotor operatively connected to said cutting mechanism and a motor casing having a laterally movable section provided with a bearing for one end of said rotor.

25. In a mining machine, a frame, cutting mechanism thereon including a cutter bar, a vertically disposed motor having its rotor operatively connected to said cutting mechanism, and a motor casing having a laterally reovable section provided with bearings for the opposite ends of said rotor.

26. In a mining machine, a frame, cutting mechanism thereon including a cutter bar, and a vertically disposed motor operatively connected to said cutting mechanism and including laterally removable motor field and armature elements.

27. In a mining machine, a frame, cutting mechanism thereon including a cutter bar, and a vertically disposed motor operatively connected to said cutting mechanism and including a laterally removable armature and a laterally removable motor field element carrying a plurality of the motor poles.

28. In a mining machine, a frame, cutting mechanism thereon including a cutter bar, a vertically disposed motor operatively connected to said cutting mechanism, a motor casing having a laterally removable section provided with a bearing for one end of the motor armature, and a rotary cuttings-expulsion member journaled coaxially with said bearing.

29. In a mining machine, a frame, cutting mechanism thereon including a cutter bar, a vertically disposed motor operatively connected to said cutting mechanism including a motor casing having a laterally removable part, feeding mechanism including a flexible feeding member, and guiding means for said flexible feeding member carried on said laterally removable part.

30. In a mining machine, an elongated mining machine frame, cutting mechanism on the front end thereof including a rigidly connected cutter chain carrying cutter bar, a motor on said frame operatively connected to said cutter chain, and cuttings-expulsion mechanism operatively connected to said motor and disposed in rear of said cutting mechanism and substantially within the rearmost limit of said frame for expelling from said frame the cuttings drawn into the same by said cutting mechanism.

31. A mining machine slidable on a mine bottom comprising a cutter chain carrying cutter bar extending longitudinally thereof during lateral cutting, a motor whose height substantially determines the height of said machine located in rear of the rear end of said chain and having its rotor operatively connected thereto through connections including a motor pinion and a gear meshing with said motor pinion and rotatable on an axis parallel to the axis of the latter, said rotor being removable through a path substantially within the vertical limits of the machine, and means for feeding said machine laterally including feed operating means disposed in front of said motor and operated thereby and flexible feeding portions acting on the opposite ends of the machine frame.

32. A mining machine slidable on a mine bottom comprising a cutter chain carrying cutter bar extending longitudinally thereof during lateral cutting, a motor whose height substantially determines the height of said machine located in rear of the rear end of said chain and having its rotor operatively connected thereto and removable rearwardly with respect to said cutter bar, and means for feeding said machine laterally including feed operating means disposed in front of said motor and operated thereby and flexible feeding portions acting on the opposite ends of the machine frame.

33. A mining machine slidable on a mine bottom comprising a cutter chain carrying cutter bar extending longitudinally thereof during lateral cutting, a motor whose height substantially determines the height of the machine located in rear of the rear end of said chain and operatively connected thereto, and means for feeding said machine laterally including feed operating means disposed on a horizontal axis in front of said motor and operated thereby and flexible feeding portions cooperating with said feed operating means and acting on the opposite ends of the machine frame.

34. A mining machine slidable on a mine bottom comprising a cutter chain carrying cutter bar extending longitudinally thereof during lateral cutting, a motor whose height substantially determines the height of the machine located in rear of the rear end of said chain and operatively connected thereto, and means for feeding said machine laterally including a feed operating member operatively connected to said motor and rotatable on an axis disposed horizontally on said machine and on the advancing side thereof in front of said motor and power operated and controlled flexible feeding portions acting on the opposite ends of the machine frame.

35. A mining machine slidable on a mine

bottom comprising cutting mechanism extending longitudinally thereof throughout its cutting operations, feeding mechanism including feed operating means rotatable on an axis disposed transversely of said machine and flexible feeding portions acting oppositely on the opposite ends of the machine frame, and a motor having a rotor operatively connected to said mechanisms and removable through a path substantially within the vertical limits of the machine, said cutting and feed operating mechanism being so disposed in front of said motor that the height of said machine is substantially the height of the motor.

36. A mining machine slidable on a mine bottom comprising cutting mechanism extending longitudinally thereof during cutting, flexible feeding mechanism including feed operating means rotatable on an axis disposed transversely of said machine and flexible feeding portions acting oppositely on the opposite ends of the machine frame, and a motor having a rotor operatively connected to said mechanisms through connections including a motor pinion and a gear meshing with said motor pinion and rotatable on an axis parallel to the axis of the latter, said rotor being removable rearwardly with respect to said bar, said cutting and feed operating mechanisms being so disposed in front of said motor that the height of said machine is substantially the height of the motor.

37. A mining machine slidable on a mine bottom comprising a cutter chain carrying cutter bar extending longitudinally thereof during lateral cutting, a motor located in rear of the rear end of said bar and operatively connected to the cutter chain thereon, and means for feeding said machine laterally including a feed operating member operatively connected to said motor and rotatable on an axis disposed transversely of said machine in front of said motor and a continuous flexible feeding member cooperating therewith and having flexible feeding portions acting on the opposite ends of the machine frame.

38. A mining machine slidable on a mine bottom comprising a cutter chain carrying cutter bar extending longitudinally thereof during lateral cutting, a motor located in rear of the rear end of said chain and operatively connected thereto, and means for feeding said machine laterally including a feed operating member on the advancing side of the machine operatively connected to said motor and rotatable on an axis disposed transversely of said machine in front of said motor and a continuous flexible feeding member cooperating therewith and having flexible feeding portions acting on the opposite ends of the machine frame.

39. A mining machine slidable on a mine bottom and comprising a cutter bar extending longitudinally thereof during lateral cutting and having a cutter chain thereon terminating within the longitudinal limits of the machine frame, a motor in rear of said chain and operatively connected thereto, lateral feeding mechanism including feed operating means in front of said motor and driven thereby and advance and receding flexible feeding portions acting on opposite ends of the machine frame, said flexible portions being adapted to be wound in and paid out by power by said feeding mechanism, and cuttings egress facilitating means carried by the machine frame and to which the cuttings are delivered by said chain expediting the discharge of cuttings from the machine.

40. A mining machine slidable on a mine bottom and comprising cutting mechanism including a cutter chain carrying cutter bar extending longitudinally thereof during lateral cutting and supported over a portion of the machine bottom within the longitudinal limits of the machine frame, a motor in rear of said bar and operatively connected to said cutting mechanism, feeding mechanism driven by said motor and having a feed operating member in front of the latter and advance and receding flexible feeding portions cooperating with said feed operating member and acting on opposite ends of the machine frame, and cuttings egress facilitating means carried by the latter above the machine bottom receiving cuttings from said chain and expediting their discharge from the machine.

41. A mining machine slidable on a mine bottom and comprising a cutter bar extending longitudinally thereof during lateral cutting and having a cutter chain thereon terminating within the longitudinal limits of the machine frame, a motor in rear of said chain and having a rotor operatively connected thereto through connections including a motor pinion and a gear meshing with said motor pinion and rotatable on an axis parallel to the axis of the latter, said rotor being removable rearwardly relative to said bar, lateral feeding mechanism including feed operating means in front of said motor and driven thereby and advance and receding flexible feeding portions acting on opposite ends of the machine frame, and cuttings egress facilitating means carried by the latter in rear of said chain and expediting the discharge of cuttings from the machine.

42. A mining machine slidable on a mine bottom and comprising a front frame portion, cutting mechanism including a cutter bar disposed longitudinally of said portion during lateral cutting and having its rear end rigidly connected thereto, a motor frame section whose height substantially determines the height of the machine disposed in rear of said portion and having a rotor operatively connected to said mechanism and removable

by a rearward movement with respect to said bar, and lateral feeding mechanism including feed operating means driven by said rotor and carried on said front portion and a plurality of flexible feeding portions acting on the opposite ends of the machine frame.

43. A mining machine slidable on a mine bottom and comprising a front frame portion, cutting mechanism including a cutter bar disposed longitudinally of said portion during lateral cutting, lateral feeding mechanism including a feed operating member carried on the advancing side of said frame portion on a transverse axis, a plurality of flexible feeding portions adapted to be wound in and paid out by power by said feeding mechanism, and directing means for said portions including a guide rotatable on a vertical axis in front of said member, and a motor connected to said portion and disposed in rear of said bar and member and connected to said cutting mechanism and feed operating member, said motor and bar being so disposed that the height of the former substantially determines the height of the machine.

44. A mining machine slidable on a mine bottom and comprising a front frame portion and a spaced bottom portion disposed below said portion, cutting mechanism including a cutter chain carrying cutter bar disposed longitudinally of said portions during cutting and having its rear end rigidly connected in the space between said portions and terminating within the longitudinal limits of the machine frame, lateral feeding mechanism including a feed operating member carried on said front portion on a transverse axis and flexible feeding means, a motor whose height substantially determines the height of the machine disposed in rear of said chain and member and having a rotor connected to said cutting mechanism and feed operating member and removable laterally within the vertical limits of the machine, and cuttings egress facilitating means above said bottom portion and in rear of said chain for expediting the discharge of cuttings from the machine.

45. In a mining machine, a frame, a supporting shoe therefor, cutting mechanism including a horizontal cutter bar carried above said shoe and having a cutter chain, a vertical driving shaft for said chain journaled on said shoe, a vertically disposed motor whose height substantially determines the height of the machine, driving connections between said motor and said shaft disposed above said motor, and feeding mechanism including a feed operating member rotatable on a transverse axis and driven by said connections.

46. In a mining machine, a frame disposed externally of the face during cutting, a supporting shoe therefor, a vertically disposed motor thereabove, a shaft parallel thereto, driving connections between said shaft and said motor, a projecting cutting means carried by said frame above said shoe and driven by said shaft, and cuttings-expulsion means driven by said motor and located in rear of said cutting means.

47. In a mining machine, a frame disposed externally of a face during cutting, a supporting shoe, a vertically disposed motor including an armature disposed above said shoe, a shaft parallel thereto, driving connections therebetween, horizontally disposed cutting means driven by said shaft and carried above said shoe, and means whereby said motor armature may be removed laterally while in its normal upright position.

48. The combination with a mining machine adapted to be fed laterally relative to the coal face during the cutting operation, of a supporting shoe, cutter driving mechanism disposed in spaced relation above the same to form a channel therebetween, cutting mechanism driven thereby including an elongated cutter chain carrying cutter bar in alinement with and extending into said channel, and cuttings distributing mechanism driven by said driving mechanism and disposed substantially wholly in said channel above said shoe and in rear of said bar for discharging the cuttings rearwardly from the machine as the latter moves laterally.

49. The combination with a mining machine, of a supporting shoe, cutter driving mechanism disposed in spaced relation above the same to form a channel therebetween opening through the rear end of the machine, cutting mechanism driven thereby including an elongated cutter chain carrying cutter bar disposed in alinement with said channel and having its rear end within the same, and means driven by said cutter driving mechanism at a point within said channel for shoveling away the cuttings at the rear end of said channel.

50. The combination with an elongated mining machine frame, of a shoe underlying the same and spaced apart therefrom to form a channel, cutter driving mechanism carried on said frame, cutting mechanism driven thereby including an elongated cutter chain carrying cutter bar disposed in alinement with said channel and having its rear end extending into the same, and a rotary cuttings distributing disc driven by said cutter driving mechanism and disposed above said shoe and sweeping in front of the rear edge of the latter.

51. The combination with a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter carrying bar projecting at one end of said machine, lateral feeding mechanism including a feed operating member rotatable on an axis extending transversely of the same end of the machine and cooperating flexible feeding means including advance and receding

flexible feeding portions acting on the opposite ends of the machine, and a motor operatively connected to said cutting mechanism and feed operating member and disposed at the opposite end of said machine.

52. The combination with a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter carrying bar projecting at one end of said machine, lateral feeding mechanism including a feed operating member rotatable on an axis extending transversely of the same end of the machine and cooperating flexible feeding means including advance and receding flexible feeding portions acting on the opposite ends of the machine, and a motor operatively connected to said cutting mechanism and feed operating member and disposed at the opposite end of said machine, said motor and feed operating member being so disposed that the axis of the latter is below the top of the motor.

53. The combination with a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter carrying bar projecting at one end of said machine, lateral feeding mechanism including a feed operating member rotatable on an axis extending transversely of the same end of the machine and cooperating flexible feeding means including advance and receding flexible feeding portions acting on the opposite ends of the machine, and a motor operatively connected to said cutting mechanism and feed operating member and disposed at the opposite end of said machine, said motor and feed operating member being so disposed that the top of said feed operating member is substantially within the vertical limits of said motor.

54. The combination with a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter carrying bar projecting at one end of said machine, lateral feeding mechanism including a feed operating member rotatable on an axis extending transversely of the same end of the machine and cooperating flexible feeding means including advance and receding flexible feeding portions acting on the opposite ends of the machine, a motor operatively connected to said cutting mechanism and feed operating member and disposed at the opposite end of said machine, and cuttings egress means at the machine end of said bar.

55. The combination with a mining machine, of an elongated machine frame slidable on its bottom on the mine bottom, cutting mechanism including a cutter carrying bar projecting from one end of said frame, feeding mechanism including a feed operating member rotatable on a transverse axis at one side of said frame and adjacent the front end thereof and a flexible feeding member cooperating with said member, and guiding means on said frame cooperating with said flexible member and directing the same laterally from opposite ends of said frame.

56. The combination with a mining machine, of an elongated machine frame slidable on its bottom on the mine bottom, cutting mechanism including a cutter carrying bar projecting from one end of said frame, a cutter driving motor caried on the rear end of said frame, feeding means including a feed operating member rotatable by said motor on a transverse axis at one side of said frame and adjacent the front end thereof and a flexible feeding member cooperating with said member, and guiding means on said frame cooperating with said flexible member and directing the same laterally from opposite ends of said frame.

57. The combination with a mining machine, of an elongated machine frame slidable on its bottom on a mine bottom, cutting mechanism including a cutter carrying bar projecting from one end of said frame, a cutter driving motor carried on the rear end of said frame and rotatable on a vertical axis, feeding means including a feed operating member rotatable by said motor on a transverse axis at one side of said frame and adjacent the front end thereof and a flexible feeding member cooperating with said member, and guiding means on said frame cooperating with said flexible member and directing the same laterally from opposite ends of said frame.

58. A mining machine comprising a feed and cutter frame section and a motor-carrying frame section located in alinement therewith, said sections being operatively connected to form a rigid structure, the maximum height of which is substantially the height of said motor frame section, lateral feeding mechanism including flexible feeding means including advance and receding flexible feeding portions acting on the opposite ends of the machine and a feed operating member cooperating with said flexible feeding portions and rotatable by said motor on a transverse axis disposed below the top of said second mentioned section, and cutting mechanism driven by said motor and disposed at the same end of the machine as said feed operating member including a cutter bar disposed in horizontal planes intersecting the motor.

59. A mining machine comprising a feed and cutter frame section and a motor-carrying frame section located in rear thereof, said sections being operatively connected to form a rigid structure slidable on its bottom on a mine bottom, the maximum height of which is substantially the height of said motor frame section, lateral feeding mechanism including flexible feeding means including advance and receding flexible feeding portions acting on the opposite ends of the machine and a feed operating member cooperating

with said flexible feeding portions and rotatable by said motor on a transverse axis and disposed below the top of said second mentioned section, and cutting mechanism driven by said motor including a cutter bar disposed during lateral cutting longitudinally of said sections in a horizontal plane above the machine bottom and rigidly connected between said first mentioned section and the machine bottom.

60. A mining machine comprising a feed frame section and a motor-carrying frame section located in rear thereof, said sections being operatively connected to form a rigid structure, lateral feeding mechanism including flexible advance and receding portions acting oppositely on the opposite ends of said structure and a feed operating member rotatable on a transverse axis on said first mentioned section and driven by said motor, and means for creating cuttings and delivering them at the rear end of said frame likewise driven by said motor and including a cutter bar disposed longitudinally of said sections during lateral cutting.

61. A mining machine comprising a feed frame section and a motor-carrying frame section located in rear thereof, said sections being operatively connected to form a rigid structure and having a passageway extending therebeneath longitudinally through the machine and a bottom member beneath said passageway slidable on the mine bottom, lateral feeding mechanism including flexible and advance and receding portions acting oppositely on the opposite ends of said structure and a feed operating member rotatable on a transverse axis on said first mentioned section and driven by said motor, and means for creating cuttings and delivering them through said passageway likewise driven by said motor and including a cutter bar disposed longitudinally of said sections during lateral cutting.

62. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter carrying bar projecting at one end of said machine, of lateral feeding and guiding mechanism operating to feed said bar transversely, said mechanism including a feed operating member rotatable on an axis extending transversely of the machine, a cooperating guiding member disposed closely adjacent the front end of the machine and to the face being cut, and cooperating flexible feeding means acting on the opposite ends of the machine including an advance flexible feeding portion extending from said feed operating member around said guiding member and laterally therefrom and a receding flexible portion extending rearwardly from the machine, and of a motor operatively connected to said cutting mechanism and feed operating member and adapted to operate either of said flexible portions by power, said motor being disposed between both said cutting mechanism and said feed operating member and the opposite end of the machine.

63. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting at one end of said machine and a cutter chain sprocket at the inner end of said bar, of lateral feeding and guiding mechanism operative to feed said bar along a face, said mechanism including a feed operating member rotatable on an axis substantially lying in a plane parallel with the face and not nearer the face than the sprocket axis, a cooperating guiding member disposed closely adjacent the front end of the machine and to the face being cut, and cooperating flexible feeding means acting on the opposite ends of the machine including an advance flexible feeding portion extending from said feed operating member around said guiding member and laterally therefrom and a receding flexible portion extending rearwardly from the machine, and of a motor operatively connected to said sprocket and feed operating member and adapted to operate either of said flexible portions by power, said motor being disposed between both said sprocket and said feed operating member and the end of the machine opposite that at which the cutter bar projects.

64. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting at one end of said machine and a cutter chain sprocket at the inner end of said bar, of lateral feeding and guiding mechanism operative to feed said bar along a face, said mechanism including a feed operating member rotatable on an axis substantially lying in a plane parallel with the face and including the sprocket axis, a cooperating guiding member disposed closely adjacent the front end of the machine and to the face, and cooperating flexible feeding means acting on the opposite ends of the machine including an advance flexible feeding portion extending from said feed operating member around said guiding member and laterally therefrom and a receding flexible guiding portion extending rearwardly from the machine, and of a motor operatively connected to said sprocket and feed operating member and adapted to operate either of said flexible portions by power, said motor being disposed between both said sprocket and said feed operating member and the end of the machine opposite that at which the cutter bar projects.

65. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting at one end of said machine and a cutter chain sprocket at

the inner end of said bar, of lateral feeding and guiding mechanism operative to feed said bar along a face, said mechanism including a feed operating member rotatable on an axis extending parallel with the face and transversely of the machine and disposed on the advancing side of the machine and on the same side of the axis of said sprocket, a cooperating guiding member disposed closely adjacent the front of the machine on the advancing side thereof, flexible feeding means acting on the opposite ends of the machine including an advance flexible feeding portion extending from said feed operating member around said guiding member and laterally therefrom and a receding flexible guiding portion extending rearwardly from the machine, and of a motor operatively connected to said sprocket and feed operating member and adapted to operate either of said flexible portions by power, said motor being disposed between said sprocket and said feed operating member and the end of the machine opposite that at which the cutter bar projects.

66. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting at one end of said machine and a cutter chain sprocket at the inner end of said bar, of lateral feeding and guiding mechanism operative to feed said bar along a face, said mechanism including a feed operating member on the advancing side of the machine rotatable on an axis extending parallel with the face and transversely of the machine and disposed in a plane in rear of a parallel plane including the axis of said sprocket, a cooperating guiding member disposed in front of said last mentioned plane and closely adjacent the front end of the advancing side of the machine, and cooperating flexible feeding means acting on the opposite ends of the machine including an advance flexible feeding portion extending from said feed operating member around said guiding member and laterally therefrom and a receding flexible guiding portion extending rearwardly from the machine, and of a motor operatively connected to said sprocket and feed operating member and adapted to operate either of said flexible portions by power, said motor being disposed between said sprocket and said feed operating member and the end of the machine opposite that at which the cutter bar projects.

67. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting from one end of said machine and disposed longitudinally of said machine during cutting along a face and a cooperating cutter chain driving sprocket, of feeding and guiding mechanism operative to feed said bar along a face, said mechanism including a feed operating member rotatable on an axis disposed in a plane parallel to the face, a cooperating guiding member disposed closely adjacent the front end of the machine, and cooperating flexible feeding means acting on the opposite ends of the machine including a flexible feeding portion extending from said feed operating member around said guiding member and laterally therefrom, and of a motor located between both said sprocket and said feed operating member and the end of the machine opposite that from which the cutter bar projects and so disposed that its height substantially determines the height of the machine, said motor having a rotor operatively connected to said sprocket and feed operating member through connections including a motor pinion and a gear meshing with said motor pinion and rotatable on an axis parallel to the axis of the latter, said rotor being removable substantially within the vertical limits of the machine and disposed on an axis extending in a direction perpendicular to the direction of the axis of said feed operating member.

68. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter carrying cutter bar projecting from one end of said machine and disposed longitudinally of said machine during cutting along a face and a cooperating cutter chain driving sprocket, of feeding and guiding mechanism operative to feed said bar along a face, said mechanism including a feed operating member rotatable on the advancing side of the machine on an axis disposed parallel to the face and transversely relative to the machine, a cooperating guiding member disposed in front of said feed operating member and closely adjacent the front end of the advancing side of the machine, and cooperating flexible feeding means acting on the opposite ends of the machine including a flexible feeding portion extending from said feed operating member around said guiding member and laterally therefrom, and of a motor located between both said sprocket and said feed operating member and the end of the machine opposite that from which the cutter bar projects and so disposed that its height substantially determines the height of the machine, said motor having a rotor operatively connected to said sprocket and feed operating member and removable substantially within the vertical limits of the machine and disposed on an axis extending in a direction perpendicular to the direction of the axis of said feed operating member.

69. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting at one end of the machine and a cooperating cutter chain

driving sprocket, of feeding and guiding mechanism operative to feed said machine along a face when said bar projects into the face, said mechanism including a feed operating member rotatable during cutting along the face on an axis not nearer the face than the axis of said sprocket, a flexible feeding member cooperating with said feed operating member and having an advance flexible feeding portion disposable in a single strand connection to a fixed point in juxtaposition to the face and in advance of the machine and a receding flexible portion disposable to a fixed point in the rear of the machine, and a guiding member for said flexible feeding member so disposed adjacent the point where the bar projects from the machine and so cooperating with the advance flexible portion of said flexible member between the feed operating member and its point of fixation as to direct the advance portion of said flexible member along the face from substantially the point from which the bar projects from the machine and to its point of fixation in a path extending substantially parallel to and closely adjacent to the face, and of a motor operatively connected to said sprocket and feed operating member and disposed between the end of the machine opposite that from which the cutter bar projects and the portion thereof carrying said sprocket and feed operating member.

70. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting at one end of the machine and a cooperating cutter chain driving sprocket, of feeding and guiding mechanism operative to feed said machine along a face when said bar projects into the face, said mechanism including a feed operating member rotatable during cutting along the face on an axis substantially coincident with a plane disposed parallel to the face and including the sprocket axis, a flexible feeding member cooperating with said feed operating member and having an advance flexible feeding portion disposable in a single strand connection to a fixed point in juxtaposition to the face and in advance of the machine and a receding flexible portion disposable to a fixed point in the rear of the machine, and a guiding member for said flexible member so disposed adjacent said feed operating member and the point where the bar projects from the machine and so cooperating with the advance flexible portion of said flexible member between said feed operating member and its point of fixation as to direct the advance portion of said flexible feeding member along the face from substantially the point from which the bar projects from the machine and to its point of fixation in a path extending substantially parallel to and closely adjacent to the face, and of a motor operatively connected to said sprocket and feed operating member and disposed between the end of the machine opposite that from which the cutter bar projects and the portion thereof carrying said sprocket and feed operating member.

71. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting at one end of the machine and a cooperating cutter chain driving sprocket, of feeding and guiding mechanism operative to feed said machine along a face when said bar projects into the face, said mechanism including a feed operating member rotatable during cutting along the face on an axis substantially coincident with a plane disposed parallel to the face and including the axis of said sprocket, a flexible feeding member cooperating with said feed operating member and having an advance flexible feeding portion disposable in a single strand connection to a fixed point in juxtaposition to the face and in advance of the machine and a receding flexible portion disposable to a fixed point in the rear of the machine, and a guiding member for said flexible member having its axis so disposed in a plane parallel to the face and between said last mentioned plane and the face and so cooperating with the advance flexible portion of said flexible member between the feed operating member and its point of fixation as to direct the advance portion of said flexible feeding member along the face from substantially the point from which said bar projects from the machine and to its point of fixation in a path extending substantially parallel to and closely adjacent to the face, and of a motor operatively connected to said sprocket and feed operating member and disposed between the end of the machine opposite that from which the cutter bar projects and the portion thereof carrying said sprocket and feed operating member.

72. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting at one end of the machine and a cooperating cutter chain driving sprocket, of feeding and guiding mechanism operative to feed said machine along a face when said bar projects into the face, said mechanism including a feed operating member rotatable during cutting along the face on an axis disposed in rear of a plane parallel to the face and including the sprocket axis, a flexible feeding member cooperating with said feed operating member and having an advance flexible feeding portion disposable in a single strand connection to a fixed point in juxtaposition to the face and in advance of the machine and a receding flexible portion disposable to a fixed point in the rear of the machine, and a guiding member for said flexible feeding member so disposed between the feed operating member and the point where

the bar projects from the machine and so cooperating with the advance flexible portion of said flexible member between the feed operating member and its point of fixation as to direct the advance portion of said flexible member along the face from the point from which the bar projects from the machine and to its point of fixation in a path extending substantially parallel to and closely adjacent to a face, and of a motor operatively connected to said sprocket and feed operating member and disposed between the end of the machine opposite that from which the cutter bar projects and the portion thereof carrying said sprocket and feed operating member.

73. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting at one end of the machine and a cooperating cutter chain driving sprocket, of feeding and guiding mechanism operative to feed said machine along a face when said bar projects into the face, said mechanism including a feed operating member rotatable during cutting along the face on an axis disposed parallel to the plane of the bar and in a plane parallel to the face and located on said axis on the advancing side of the sprocket axis, a flexible feeding member cooperating with said feed operating member and having an advance flexible feeding portion disposable in a single strand connection to a fixed point in juxtaposition to the face and in advance of the machine and a receding flexible portion disposable to a fixed point in the rear of the machine, and a guiding member for said flexible feeding member so disposed between the feed operating member and the point where the bar projects from the machine and so cooperating with the advance flexible portion of said flexible member between the feed operating member and its point of fixation as to direct the advance portion of said flexible member along the face from the point from which the bar projects from the machine and to its point of fixation in a path extending substantially parallel to and closely adjacent to the face, and of a motor operatively connected to said sprocket and feed operating member and disposed between the end of the machine opposite that from which the cutter bar projects and the portion thereof carrying said sprocket and feed operating member.

74. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting at one end of the machine and a cooperating cutter chain driving sprocket, of feeding and guiding mechanism operative to feed said machine along a face when said bar projects into the face, said mechanism including a feed operating member on the end of said machine carrying said sprocket and rotatable during cutting along the face on an axis substantially coincident with a plane disposed transversely relative to the longest dimension of said machine and including the axis of said sprocket, a flexible feeding member cooperating with said feed operating member and having an advance flexible feeding portion disposable in a single strand connection to a fixed point in juxtaposition to the face and in advance of the machine and a receding flexible portion disposable to a fixed point in the rear of the machine, and a guiding member for said flexible member so disposed adjacent said feed operating member and relative to the point where the bar projects from the machine and so cooperating with the advance flexible portion of said flexible member between the feed operating member and its point of fixation as to direct the advance portion of said flexible feeding member along the face from substantially the point from which said bar projects and to its point of fixation in a path extending substantially parallel to and closely adjacent to the face, and of a motor operatively connected to said sprocket and feed operating member and disposed between the end of the machine opposite that from which the cutter bar projects and the portion thereof carrying said sprocket and feed operating member.

75. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting at one end of the machine and a cooperating cutter chain driving sprocket, of feeding and guiding mechanism operative to feed said machine along a face when said bar projects into the face, said mechanism including a feed operating member on the end of said machine carrying said sprocket and rotatable during cutting along the face on an axis parallel to the plane of said bar and substantially coincident with a plane disposed transversely relative to the longest dimension of said bar and including the axis of said sprocket, a flexible feeding member cooperating with said feed operating member and having an advance flexible feeding portion disposable in a single strand connection to a fixed point in juxtaposition to the face and in advance of the machine and a receding flexible portion disposable to a fixed point in the rear of the machine, and a guiding member for said flexible member so disposed adjacent said feed operating member and the point where the bar projects from the machine and so cooperating with the advance flexible portion of said flexible member between the feed operating member and its point of fixation as to direct the advance portion of said flexible feeding member along the face from substantially the point from which said bar projects and to its point of fixation in a path extending sub-

stantially parallel to and closely adjacent to the face, and of a motor operatively connected to said sprocket and feed operating member and disposed between the end of the machine opposite that from which the cutter bar projects and the portion thereof carrying said sprocket and feed operating member.

76. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting at one end of said machine and a cooperating cutter chain driving sprocket, of feeding and guiding mechanism operative to feed said machine along a face when said bar projects into the face, said mechanism including a feed operating member rotatable during cutting along the face on an axis parallel to the face and the plane of said bar, a flexible feeding member cooperating with said feed operating member and having an advance flexible feeding portion disposable in a single strand connection to a fixed point in justaposition to the face and in advance of the machine and a receding flexible portion disposable to a fixed point in the rear of the machine, and guiding means for said flexible member including a guiding member so disposed relative to said feed operating member and so cooperating with the advance flexible portion of said flexible member between the feed operating member and its point of fixation as to direct the advance portion of said flexible feeding member along the face to its point of fixation substantially in a plane parallel to and adjacent the face and including the point from which the bar projects, and of a motor operatively connected to said sprocket and feed operating member, said motor and all of said previously mentioned elements being so disposed that the height of the machine is substantially the height of said motor.

77. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting at one end of the machine and a cooperating cutter chain driving sprocket, of feeding and guiding mechanism operative to feed said machine along a face when said bar projects into the face, said mechanism including a winding member, a flexible feeding member cooperating with said winding member and having an advance flexible feeding portion disposable in a single strand connection to a fixed point in juxtaposition to the face and in advance of the machine and a receding flexible portion disposable to a fixed point in the rear of the machine, and a guiding member for the advance flexible portion of said flexible member disposed adjacent said winding member and the point where the bar projects from the machine, said winding member and said cutter chain driving sprocket rotating on axes lying substantially within a plane disposed parallel to the face during cutting along the latter and said guiding member being disposed between said plane and the face, and a motor operatively connected to said sprocket and winding member and disposed between the end of the machine opposite that from which the cutter bar projects and the portion thereof carrying said sprocket and winding member.

78. The combination in a mining machine slidable on its bottom on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting at one end of the machine and a cooperating cutter chain driving sprocket, of feeding and guiding mechanism operative to feed said machine along a face when said bar projects into the face, said mechanism including a feed operating member rotatable during cutting along the face on an axis substantially coincident with a plane disposed parallel to the face and including the sprocket axis, a flexible feeding member cooperating with said feed operating member and having an advance flexible feeding portion disposable in a single strand connection to a fixed point in juxtaposition to the face and in advance of the machine and a receding flexible portion disposable to a fixed point in the rear of the machine, a guiding member for said flexible feeding member so disposed adjacent the point where the bar projects from the machine and so cooperating with the advance flexible portion of said flexible member between the feed operating member and its point of fixation as to direct the advance portion of said flexible member along the face from the point from which the bar projects from the machine and to its point of fixation in a path extending substantially parallel to and closely adjacent to a face, and cooperating guiding means acting on the receding portion of said flexible member and acting to control the position of the opposite end of the machine during cutting along the face, and of a motor operatively connected to said sprocket and feed operating member and disposed between the end of the machine opposite that from which the cutter bar projects and the portion thereof carrying said sprocket and feed operating member.

79. The combination in a mining machine slidable on a mine bottom, of cutting mechanism including a cutter chain carrying cutter bar projecting at one end of the machine and a cooperating cutter chain driving sprocket, of feeding and guiding mechanism operative to feed said machine along a face when said bar projects into the face, said mechanism including a rotatable feed operating member, a flexible feeding member cooperating with said feed operating member and disposable in a single strand connection to a fixed point in juxtaposition to the face and in advance of the machine, and a

guiding member for said flexible member so disposed during cutting along the face adjacent said feed operating member and the inner end of said bar and acting on said flexible member between said feed operating member and said point of fixation as to direct said flexible member along the face from a point closely adjacent the inner end of said bar to said point of fixation in a path extending substantially parallel to and closely adjacent to the face, and of a motor located between the end of the machine opposite that from which the cutter bar projects and the portion thereof carrying said sprocket and feed operating member and so disposed that its height substantially determines the height of the machine, said motor having a rotor operatively connected to said sprocket and feed operating member disposed on an axis extending in a direction perpendicular to the direction of the axis of said feed operating member and removable through a path substautially within the vertical limits of the machine.

80. In a mining machine, a machine frame slidable on its bottom on the mine bottom, cutting mechanism disposed at the forward end of said frame including a forwardly projecting horizontal cutter bar, a motor disposed at the rear end of said frame and having driving connection with said cutting mechanism, said cutter bar being disposed in planes intersecting said motor, and machine feeding means driven by said motor disposed at the forward end of said frame in advance of said motor, said feeding means including a feed operating member mounted for rotation at the forward end of said frame, and power operated and controlled flexible feeding means including advance and receding flexible portions extending in opposite directions from the opposite ends of said frame, said advance portion cooperating with said feed operating member and both of said flexible portions being operated by power from said motor.

81. In a mining machine, a machine frame slidable on its bottom on the mine bottom, cutting mechanism disposed at the forward end of said frame including a forwardly projecting horizontal cutter bar, a motor disposed at the rear end of said frame and having driving connection with said cutting mechanism, said cutter bar being disposed in planes intersecting said motor, and machine feeding means driven by said motor disposed at the forward end of said frame in advance of said motor, the vertical dimension of said motor substantially determining the height of the mining machine, said feeding means including a feed operating member mounted for rotation at the forward end of said frame, and power operated and controlled flexible feeding means including advance and receding flexible portions extending in opposite directions from the opposite ends of said frame, said advance portion cooperating with said feed operating member and both of said flexible portions being operated by power from said motor.

82. In a mining machine, a machine frame slidable on its bottom on the mine bottom, cutting mechanism disposed at the forward end of said frame including a forwardly projecting horizontal cutter bar, a motor disposed at the rear end of said frame and having driving connection with said cutting mechanism, said cutter bar being disposed in planes intersecting said motor, and machine feeding means driven by said motor and disposed at the forward end of said frame in advance of said motor, said feeding means including a feed operating member rotatable on a horizontal axis extending transversely of the machine frame at its front end, and power operated flexible feeding means including advance and receding flexible portions extending in opposite directions from the opposite ends of said frame, said advance portion cooperating with said feed operating member and both of said flexible portions being operated by power from said motor.

83. In a mining machine, a machine frame slidable on its bottom on the mine bottom, cutting mechanism disposed at the forward end of said frame including a forwardly projecting horizontal cutter bar, a motor disposed at the rear end of said frame and having driving connection with said cutting mechanism, the vertical dimensions of said motor substantially determining the height of the mining machine, said cutter bar being disposed in planes intersecting said motor, and machine feeding means driven by said motor and disposed at the forward end of said frame in advance of said motor, said feeding means including a feed operating member rotatable on a horizontal axis extending transversely of the machine frame at its front end, and power operated flexible feeding means including advance and receding flexible portions extending in opposite directions from the opposite ends of said frame, said advance portion cooperating with said feed operating member and both of said flexible portions being operated by power from said motor.

84. In a mining machine, a machine frame slidable on its bottom on the mine bottom, cutting mechanism carried by said frame including a forwardly projecting horizontal cutter bar, a motor carried by said frame and having driving connection with said cutting mechanism, feeding means driven by said motor including a feed operating member and cooperatively flexible feeding means including oppositely extending advance and receding flexible portions acting on the opposite ends of the machine frame, and slack

handling mechanism carried by said frame including conveying means rotatable at the rear end of said frame about a vertical axis disposed at the central longitudinal center of the machine and adapted to convey cuttings created by said cutting mechanism and to move the cuttings rearwardly of said cutting mechanism.

85. In a mining machine, a machine frame slidable on its bottom on the mine bottom, kerf cutting mechanism carried by said frame and movable along a coal face in which a kerf is being cut, and means carried by said frame for handling the slack created by said cutting mechanism including a cuttings expulsion member disposed directly in the rear of said cutting mechanism and means for actuating said member to cause the same to receive the slack brought back from the kerf by the cutting mechanism and to discharge the slack rearwardly of the machine and away from the coal face.

86. In a mining machine, a machine casing, slidable on its bottom on the mine bottom, kerf cutting mechanism including a laterally projecting cutter bar at one end of said casing, and slack handling mechanism carried by said casing at the end thereof opposite from said cutter bar and disposed wholly outside of the coal face for discharging the slack laterally away from the face and out of the path of the machine.

87. In a mining apparatus, a mining machine including a machine casing and a laterally projecting cutter bar at one end thereof, and slack handling mechanism carried by said casing and disposed adjacent said bar at the end of said casing opposite from said bar and within the lines of said casing to move the slack created by said cutter bar laterally of the face and out of the path of the machine.

88. In a mining machine, a machine frame slidable on its bottom on the mine bottom, a motor carried by said frame, the vertical dimension of said motor substantially determining the height of the machine, cutting mechanism carried by said frame and driven by said motor and including a cutter bar disposed in horizontal planes the median one of which intersects said motor, and machine feeding mechanism driven by said motor including a feed operating member and power operated and controlled flexible feeding means including advance and receding flexible portions extending in opposite directions from the opposite ends of said frame, said advance portion cooperating with said feed operating member and both of said flexible portions being operated by power from said motor.

89. A mining machine slidable on a mine bottom, comprising a cutter chain carrying cutter bar extending longitudinally thereof during lateral cutting, a motor located in rear of the rear end of said bar and operatively connected to the cutter chain thereon, the vertical dimension of said motor substantially determining the height of the machine, and means for feeding said machine laterally including a feed operating member operatively connected to said motor and a continuous flexible feeding member cooperating therewith and having flexible feeding portions acting on the opposite ends of the machine frame.

90. The combination in a mining machine, of an elongated machine frame slidable on its bottom on the mine bottom, cutting mechanism including a cutter chain carrying cutter bar projecting from one end of said frame, a motor carried by said frame at the rear of the rear end of said cutter bar and operatively connected to said cutting mechanism, the vertical dimension of said motor substantially determining the height of the machine, machine feeding mechanism including a feed operating member carried by said frame at the front end thereof and a flexible feeding member cooperating with said feed operating member, and guiding means on said frame cooperating with said flexible member and directing the same laterally from the opposite ends of said frame.

In testimony whereof I affix my signature.

FRANK CARTLIDGE.