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MINING MACHINE

Original Filed July 30, 1934

2 Sheets-Sheet 1

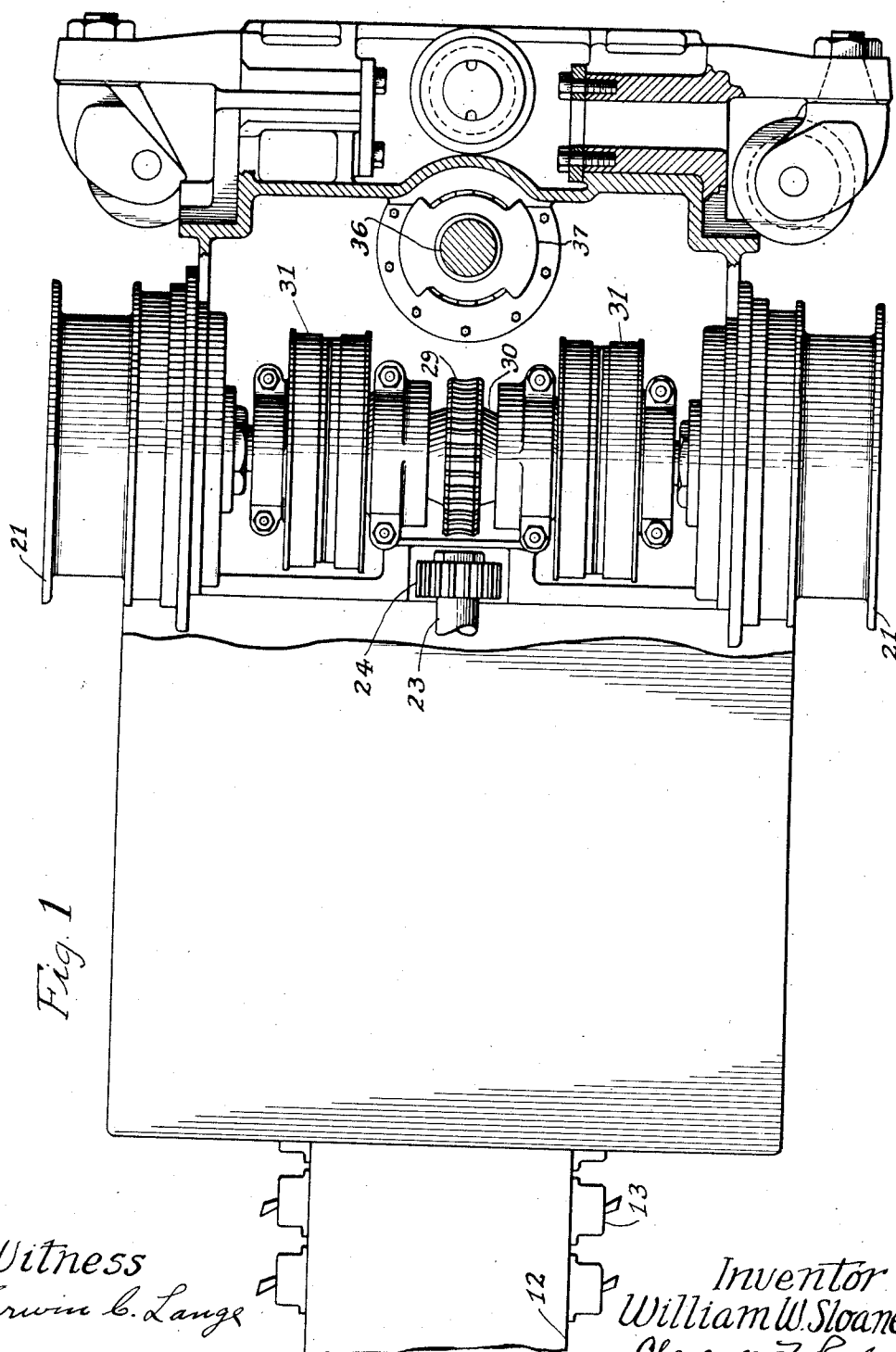


Fig. 1

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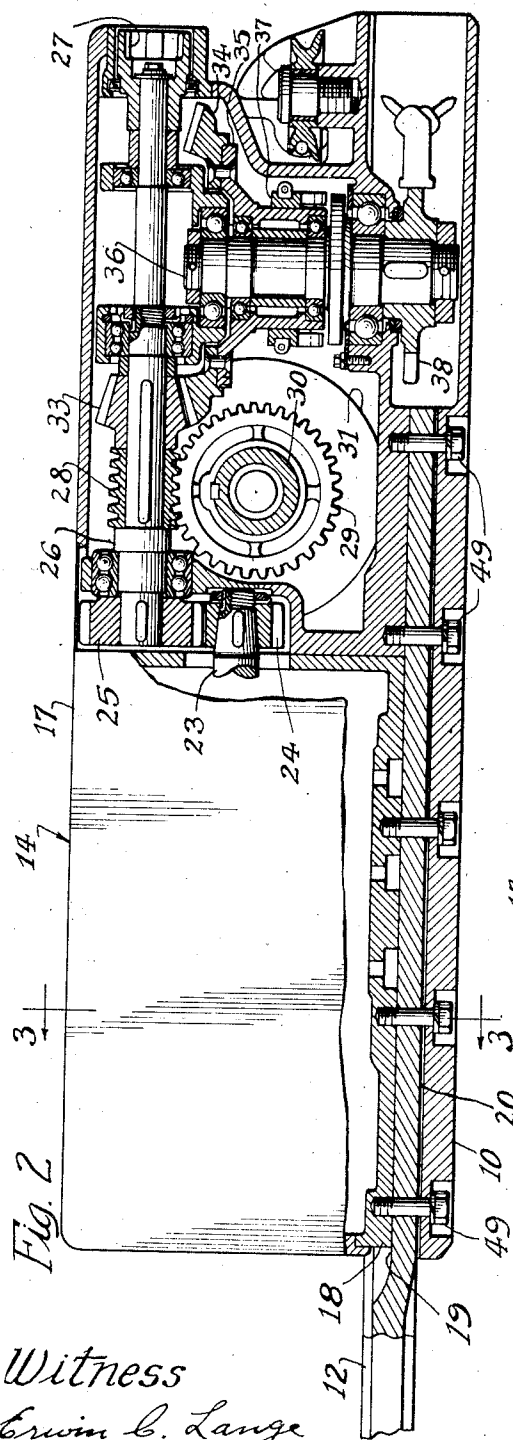
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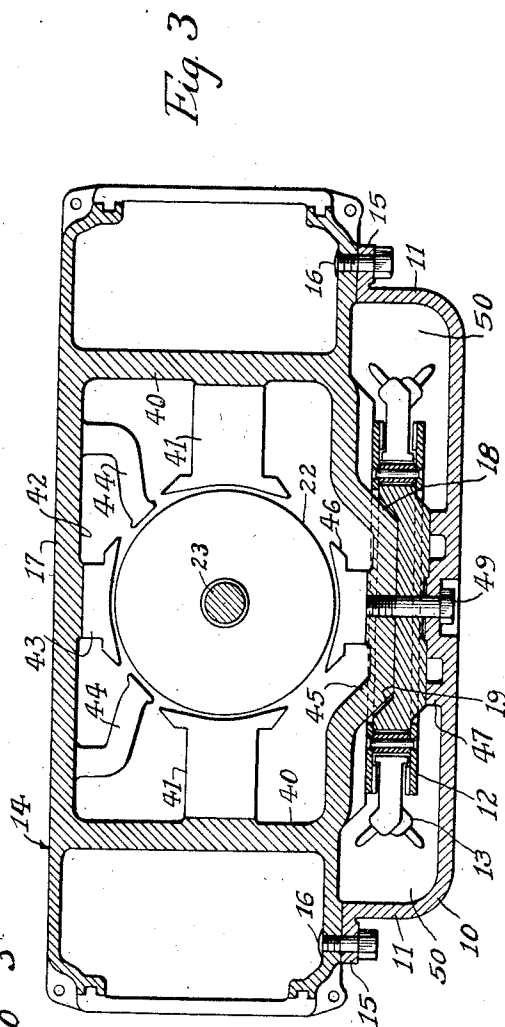
MINING MACHINE

Original Filed July 30, 1934

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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MINING MACHINE

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Goodman Manufacturing Company, Chi-
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Application July 30, 1934, Serial No. 737,533
Renewed June 27, 1936

17 Claims. (Cl. 262—30)

My invention relates to improvements in min-
ing machines of the room and pillar type partic-
ularly adapted for use in thin seams of coal.

Among the objects of my invention are to pro-
vide a new and improved mining machine of the
room and pillar low vein type which is adapted to
discharge the cuttings beneath the motor from
the rear of the machine, and is arranged with a
view towards utmost compactness, especially in
longitudinal and vertical dimensions, and ut-
most accessibility, flexibility and efficiency in op-
eration.

Heretofore, mining machines of the low vein
room and pillar type have been so arranged that
the motor rests on the bottom and substantially
determines the height of the machine while the
cutting mechanism is disposed forwardly of the
motor and the cuttings are discharged to one
side thereof. Such an arrangement has its dis-
advantages in that it is difficult to adequately
clear cuttings from the cutter chain and in that
a reversible cuttings deflecting means must be
provided when using the machine for cutting in
reverse directions. The device of my invention
is arranged as to be of a low over-all height and
provide a passageway for discharging the cut-
tings from the rear of the machine in a more
efficient manner than formerly by a novel ar-
rangement of the cutting and feeding mecha-
nism and the drive motor therefor.

My invention may be more clearly understood
with reference to the accompanying drawings
wherein:

Figure 1 is a top plan view of one embodiment
of my invention with certain parts broken away
and shown in horizontal section;

Figure 2 is a fragmentary sectional view of the
device shown in Figure 1, with certain parts
taken in substantially longitudinal section; and

Figure 3 is a sectional view taken substantially
along line 3—3 of Figure 2.

In the drawings, the embodiment of the min-
ing machine illustrated includes a main frame 10
having a bottom surface adapted to rest on and
slide along the mine bottom. Said main frame
extends along the entire machine, is open at the
forward and rearward ends thereof, and is pro-
vided with upstanding side walls 11, 11 extend-
ing therealong.

A cutter bar 12 projects forwardly of said
main frame and has a cutter chain 13 movable
thereabout in an orbital path. A motor 14 is
secured to the forward portion of said main
frame on flanges 15, 15 extending laterally from
the side walls 11, 11 by means of suitable bolts

16, 16. Said motor includes a motor casing 17
having a depending portion 18 resting in a recess
19 formed in a rearwardly projecting portion 20
of the cutter bar 12. The details and objects of
this construction will hereinafter more fully ap-
pear as this specification proceeds.

The rearward portion of said main frame is
arranged to provide a housing and support
means for the feeding and cutter chain drive
mechanism and has a pair of independently ro-
tatable winding drums 21, 21 arranged at oppo-
site sides thereof. Said winding drums are
adapted to have flexible cables (not shown)
wound thereon which may be trained laterally
from either the forward or rearward ends of the
machine in a usual manner for feeding and con-
trolling movement of the machine along the
mine bottom.

The motor 14 is provided with an armature 22
extending longitudinally thereof and carried on
an armature shaft 23 which drives the cutting
and feeding mechanism in the following manner:

An armature pinion 24 is keyed on the rear-
ward end of said armature shaft and meshes
with and drives a spur gear 25 keyed on the for-
ward end of a longitudinally extending shaft 26.
Said shaft is journaled in suitable anti-friction
bearings supported in the upper portion of the
main frame 10, and has a socket 27 secured to
its outer end for driving a supporting truck (not
shown) for the mining machine in a usual man-
ner, for transporting the machine from working
place to working place. A worm 28 is keyed to
said shaft adjacent the rearward end thereof and
meshes with and drives a worm gear 29 keyed on
a sleeve 30 disposed beneath said shaft. Said
sleeve forms a means for driving a pair of coax-
ial planetary gear reduction devices 31, 31 ar-
ranged on opposite sides thereof. Said planeta-
ries are of the type frequently employed in min-
ing machines of this character; as, for instance,
as shown and described in a prior application,
Serial Number 698,599, filed by Frank A. Lind-
gren on November 18, 1933, so need not herein
be described in detail. Said planetaries are ar-
ranged to form an independent drive for each of
the winding drums 21, 21 from the motor 14 at
either a high frictionally controlled positioning
speed or a low frictionally controlled feeding
speed, or permit either of said winding drums to
be disconnected therefrom and rotate under the
control of the usual friction bands (not shown)
in the usual manner, to retard the unwinding
of said drums.

A bevel pinion 33 is keyed on the shaft 26 ad-

adjacent but rearwardly of the worm 22 and meshes with and drives a bevel gear 34 secured to a spider 35 depending therefrom, which spider is journaled on its hub on a vertical shaft 36. Suitable jaw clutch means, generally indicated by reference character 37, are provided for selectively driving said shaft from said bevel gear. A sprocket 38 is keyed on the lower end of the shaft 35 and meshes with and drives the cutter chain 13 about the cutter bar 12. It should be noted that said shaft and sprocket are arranged adjacent the rearward end of the main frame 10, so that cuttings may readily be discharged through the open rearward end thereof.

Referring now to the novel construction and arrangement of the motor 14 for keeping the height of the machine to a minimum, the casing 17 therefor, as herein shown, has laterally extending integrally formed chambers, which contain the rheostat and controller (not shown) for said motor. The inside of the major portion of said casing encloses the armature 22 and has vertical side walls 40, 40 which have salient poles 41, 41 secured thereto. A plane horizontal inner top surface 42 of the inside of said casing has a consequent pole 43 secured thereto and interpoles 44, 44 disposed on opposite sides thereof, the pole pieces of which extend angularly towards said armature. The bottom of the inside of said casing extends horizontally inwardly from the side walls 40, 40 and has a depressed or recessed central portion 45 extending longitudinally therealong.

The outer sides of said bottom are eccentric of the center of the armature and the recessed central portion of said bottom has a consequent field pole 46 mounted therein. Said recessed portion is of such a depth that the top of said field pole is substantially in alignment with the horizontal outer sides of said bottom. The outer side of the bottom of said casing conforms to the inside thereof and thus forms the depending portion 18 of said motor casing hereinbefore referred to.

It will be seen from the foregoing that the arrangement of the motor 14 and casing 17 is such that the armature is eccentric of the center of the major area of said casing and that to maintain the proper power characteristics of the motor and conserve in its height, the lower consequent field is recessed below a plane extending across the outer sides of the bottom of said casing. This makes it possible to recess the depending portion of the motor in the cutter bar and thus reduce the effective height of the machine.

The cutter bar 12 is secured between the bottom of the depending portion 18 of the motor 14 and the top of an integral upwardly extending supporting projection 47 of the main frame 10 on the rearwardly projecting portion 20 of said cutter bar which is interposed therebetween. Said projecting portion of said cutter bar extends longitudinally along said motor beyond the rearward end thereof to a point disposed adjacent but forwardly of the sprocket 38, and the outsides of said portion have guides extending therealong for guiding the cutter chain 13 thereabout and forming a continuation of said cutter bar. Suitable cap screws 49, 49 are spaced longitudinally along the bottom of said main frame and extend through said cutter bar and are threaded within the bottom surface of said motor casing and said main frame for securing said cutter bar to said main frame.

Thus, said motor casing is arranged so that a

portion thereof is beneath and is intersected by a horizontal plane extending through the cutter chain 13, and the orbit of said cutter chain is within the lateral boundaries of said motor casing.

The side walls 11, 11 of the main frame form cuttings passageways 50, 50 along opposite sides of the cutter bar 12 between the bottom of said main frame and the under surface of said motor casing. Thus, these passageways form a continuation of the kerf and during cutting, the cuttings are carried from said kerf by the cutter chain along the advance passageway 50 and discharged by said cutter chain from the rearward end of the machine.

While I have herein shown and described one form in which my invention may be embodied, it will be understood that the construction and arrangement of the various parts may be altered or changed without departing from the spirit and scope thereof. Furthermore, I do not wish to be construed as limiting myself to the particular form illustrated, excepting as it may be limited in the appended claims.

I claim as my invention:

1. In a room and pillar mining machine, a horizontal cutter bar having a cutter chain movable thereabout in a closed orbital path, and drive means for said cutter chain including a horizontal motor having a motor casing with a major portion disposed above said cutter bar and cutter chain of greater width than said cutter bar and chain and having a depending portion of less horizontal area than said major portion which lies within the orbit of said cutter chain.

2. In a room and pillar mining machine, a main frame slidable along the mine bottom, a horizontal plane cutter bar extending along said main frame and projecting forwardly therefrom, and means for driving said cutter chain about said cutter bar in a closed orbital path comprising a horizontal motor including a motor casing having a major portion disposed above said cutter bar and having its lateral boundaries outside of the orbit of said cutter chain and a depending portion intersected by a horizontal plane drawn through said cutter chain.

3. In a room and pillar mining machine, a main frame slidable along the mine bottom, a horizontal plane cutter bar extending along said main frame and projecting forwardly therefrom, and means for driving said cutter chain about said cutter bar in a closed orbital path comprising a horizontal motor including a motor casing secured to said main frame and having a major portion disposed above said cutter bar, the space between said motor casing and the bottom of said main frame forming a cuttings passageway and the upper portion of said cutter chain and cutter bar lying in a horizontal plane which intersects a portion of said motor.

4. In a room and pillar mining machine, a horizontal cutter bar having a cutter chain movable thereabout in a closed orbital path, and drive means for said cutter chain including a horizontal motor having a motor casing of greater width than said cutter bar and having a depending portion recessed within said cutter bar and intersected by a horizontal plane passing through said cutter chain.

5. In a room and pillar mining machine, a main frame slidable along the mine bottom, a horizontal plane cutter bar extending along said main frame and projecting forwardly therefrom, and means for driving said cutter chain about

said cutter bar in a closed orbital path comprising a horizontal motor including a motor casing having a major portion disposed above said cutter bar and having a depending portion of less horizontal area than said major portion recessed within said cutter bar and disposed within the orbit of said cutter chain, and the inside of said depending portion forming a recess in said casing for supporting a pole piece for said motor.

6. A mining machine in accordance with claim 1, wherein the motor casing has a horizontal plane upper inside surface and a lower inside surface, the outer sides of which lower inside surface lie in a horizontal plane closer to the center of the armature of said motor than the upper inside surface thereof, and wherein said lower surface is longitudinally recessed in the center thereof.

7. A mining machine in accordance with claim 1, wherein the motor casing has a horizontal plane upper inside surface and a lower inside surface, the outer sides of which lower inside surface lie in a horizontal plane closer to the center of the armature of said motor than the upper inside surface thereof, wherein said lower surface is longitudinally recessed in the center thereof, and wherein the recessed portion of said casing forms a support means for a pole piece of said motor.

8. A mining machine in accordance with claim 1, wherein the motor casing has a horizontal plane upper inside surface and a lower inside surface, the outer sides of which lower inside surface lie in a horizontal plane closer to the center of the armature of said motor than the upper inside surface thereof, wherein said lower inside surface is longitudinally recessed in the center thereof, wherein the recessed portion of said casing forms a support means for a pole piece of said motor and wherein said recessed portion depends from the major portion of said motor casing and is within the orbit of said cutter chain.

9. A mining machine in accordance with claim 1, wherein the motor casing has a horizontal plane upper inside surface and a lower inside surface, the outer sides of which lower inside surface lie in a horizontal plane closer to the center of the armature of said motor than the upper inside surface thereof, wherein said lower surface is longitudinally recessed in the center thereof, wherein the recessed portion of said casing forms a support means for a pole piece of said motor and wherein said recessed portion depends from the major portion of said motor casing and is recessed within said cutter bar and is intersected by a horizontal plane passing through said cutter chain.

10. A mining machine in accordance with claim 1, wherein the motor is provided with a motor casing having a horizontal plane upper inside surface, vertical plane inner sides, and a lower surface having outer portions adjacent said vertical side walls arranged in a horizontal plane closer to the center of the armature of said motor than said upper inside surface and being longitudinally recessed adjacent the center thereof, the vertical sides of said motor providing a support means for the salient field coils of said motor, the upper surface providing a support means for one consequent field of said motor and the recessed portion of said motor forming a support means for the other consequent pole of said mo-

tor and being intersected by a horizontal line passing through said cutter chain.

11. A mining machine in accordance with claim 1, wherein the motor is provided with a motor casing having a horizontal plane inside top surface, vertical plane inner sides, and a lower surface arranged in a horizontal plane closer to the center of the armature of said motor adjacent the longitudinal sides thereof than said inside top surface and longitudinally recessed adjacent the center thereof, the longitudinal vertical sides of said motor providing a support means for the salient field coils of said motor, the inside top surface providing a support means for spaced interpoles and one consequent pole of said motor arranged therebetween, and the recessed portion of said motor forming a support means for the other consequent pole of said motor, and said recessed portion depending from the major of said motor casing and being recessed within said cutter bar.

12. In a low vein room and pillar mining machine of the type wherein the cuttings are discharged rearwardly of the machine, a main frame having parallel-spaced upstanding side walls, a horizontal motor having a motor casing supported on said side walls and having a depending portion, and a cutter bar interposed between said main frame and motor within the lateral limits of said motor, said cutter bar extending forwardly of said motor and having the depending portion of said motor casing recessed therein.

13. In a low vein room and pillar mining machine of the type wherein the cuttings are discharged rearwardly of the machine, a main frame having parallel-spaced upstanding side walls, a horizontal motor having a motor casing supported by said side walls and having a depending portion, and a cutter bar interposed and secured between said main frame and motor within the lateral limits of said motor having a cutter chain movable thereabout in a closed orbital path within the lateral limits of said motor, but outside of the limits of said depending portion.

14. In a low vein room and pillar mining machine of the type wherein the cuttings are discharged rearwardly of the machine, a main frame having parallel-spaced upstanding side walls, a motor supported on said side walls and including a motor casing having a depending portion, and a cutter bar interposed between said main frame and motor within the lateral limits of said motor having a cutter chain movable thereabout in a closed orbital path within the lateral limits of said motor, but outside of the limits of said depending portion, said main frame being open to the rearward end thereof and the space between said main frame and motor casing forming a closed cuttings passageway open to the rearward end of said machine.

15. In a low vein room and pillar mining machine of the type wherein the cuttings are discharged rearwardly of the machine, a main frame having parallel-spaced upstanding side walls, a motor supported on said side walls and including a motor casing having a depending portion, a forwardly projecting horizontal plane cutter bar interposed between said main frame and motor within the lateral limits of said motor, a cutter chain movable about said cutter bar in a closed orbital path and driven from the rearward end of said motor at a point disposed adjacent the rearward end of said main frame, said cutter bar having the depending portion of said motor casing

recessed therein and the orbit of said cutter chain being within the lateral limits of said motor.

16. In a low vein room and pillar mining machine of the type wherein the cuttings are discharged rearwardly of the machine, a main frame having parallel-spaced upstanding side walls, a motor supported on said side walls and including a motor casing having a depending portion, a forwardly projecting horizontal plane cutter bar interposed between said main frame and motor within the lateral limits of said motor, a cutter chain movable about said cutter bar in a closed orbital path and driven from the rearward end of said motor at a point disposed adjacent the rearward end of said main frame, said cutter bar having the depending portion of said motor casing recessed therein, said main frame being open to the rearward end thereof and the space between said main frame and motor forming a closed cuttings passageway cooperating with said cutter chain for discharging cuttings from the rearward end of said machine, and the orbit of said cutter chain being within the lateral limits of said motor, but outside of the limits of said depending portion of said motor.

17. In a low vein room and pillar mining ma-

chine of the type wherein the cuttings are discharged rearwardly of the machine, a main frame having parallel-spaced upstanding side walls, a horizontal motor supported on said side walls and including a motor casing having a depending portion, a forwardly projecting horizontal plane cutter bar secured between said main frame and motor and disposed within the lateral limits of said motor, a cutter chain movable about said cutter bar in a closed orbital path and driven from the rearward end of said motor at a point disposed adjacent the rearward end of said main frame, said cutter bar having the depending portion of said motor casing recessed therein, said main frame being open to the rearward end thereof and the space between said main frame and motor casing forming a closed cuttings passageway cooperating with said cutter chain for discharging cuttings from the rearward end of said machine, the orbit of said cutter chain being within the lateral limits of said motor, and a horizontal plane drawn through said cutter chain intersecting said depending portion of said motor casing.

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