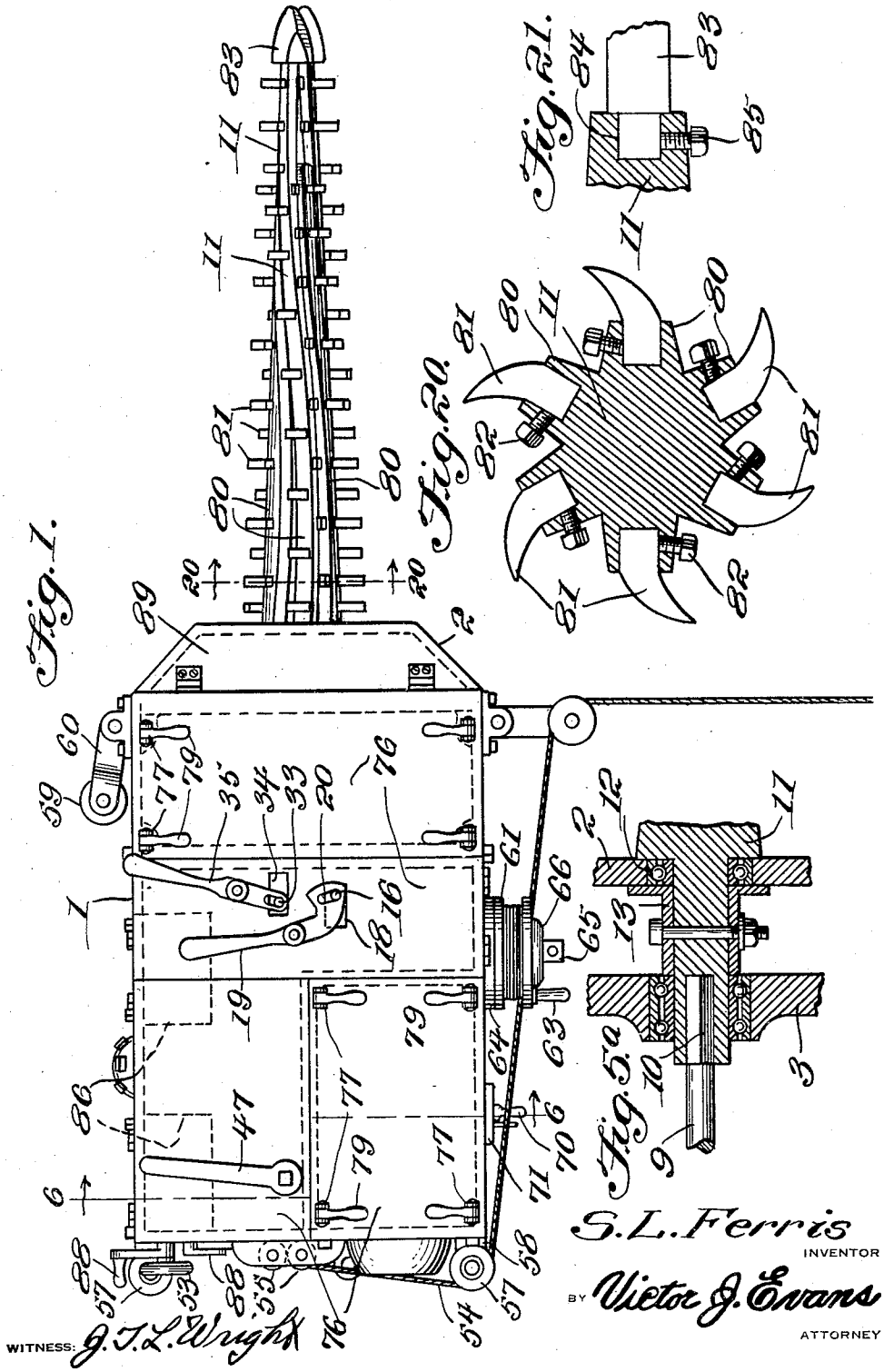
Nov. 3, 1931. S. L. FERRIS 1,830,267

MINING MACHINE

Filed Dec. 17, 1928 6 Sheets-Sheet 1



Nov. 3, 1931. S. L. FERRIS 1,830,267

MINING MACHINE

Filed Dec. 17, 1928 6 Sheets-Sheet 2

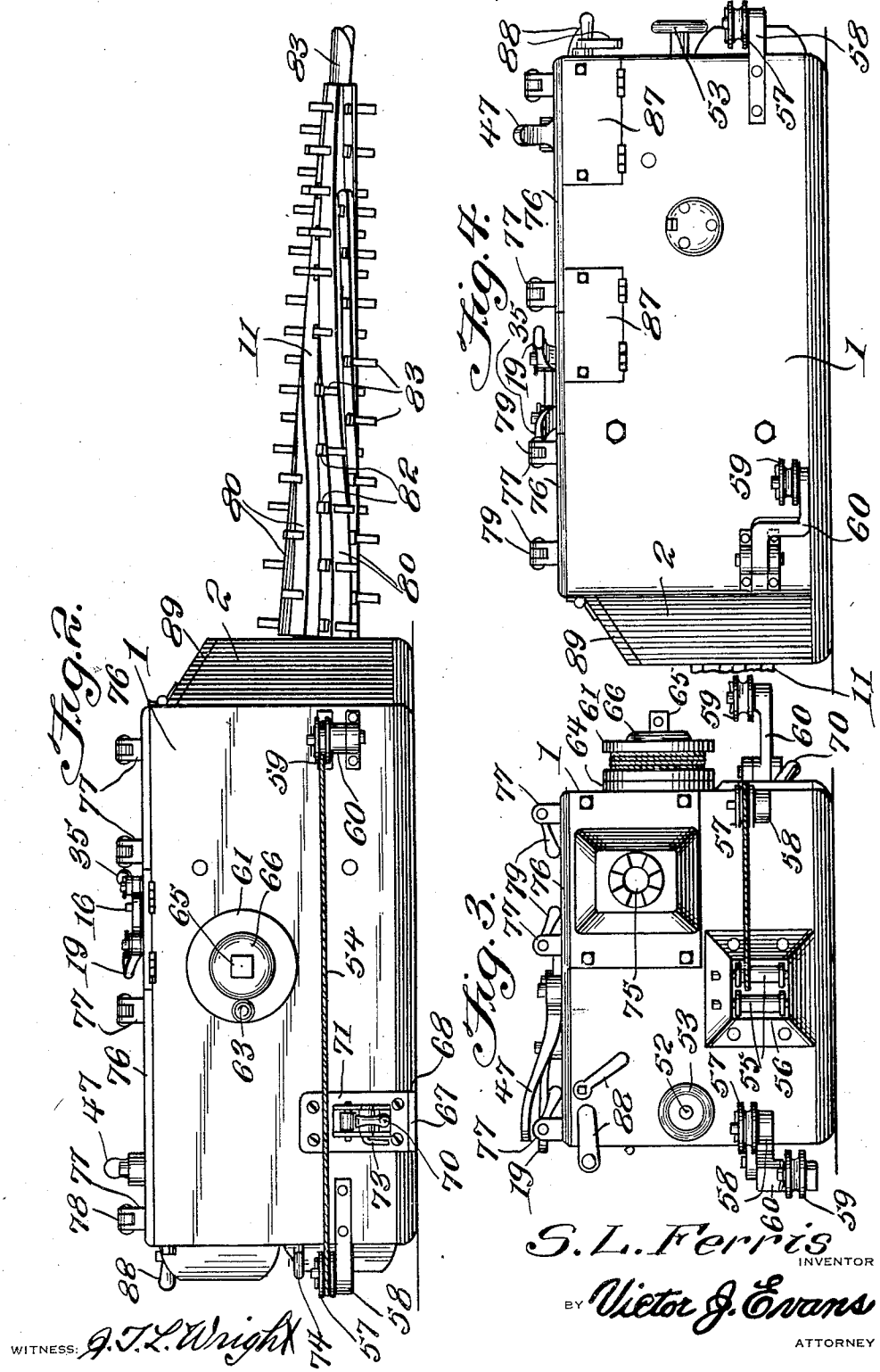


Fig. 2.

Fig. 4.

Fig. 3.

WITNESS: J. L. Wright

S. L. Ferris INVENTOR

BY Victor J. Evans

ATTORNEY

Nov. 3, 1931. S. L. FERRIS 1,830,267

MINING MACHINE

Filed Dec. 17, 1928 6 Sheets-Sheet 3

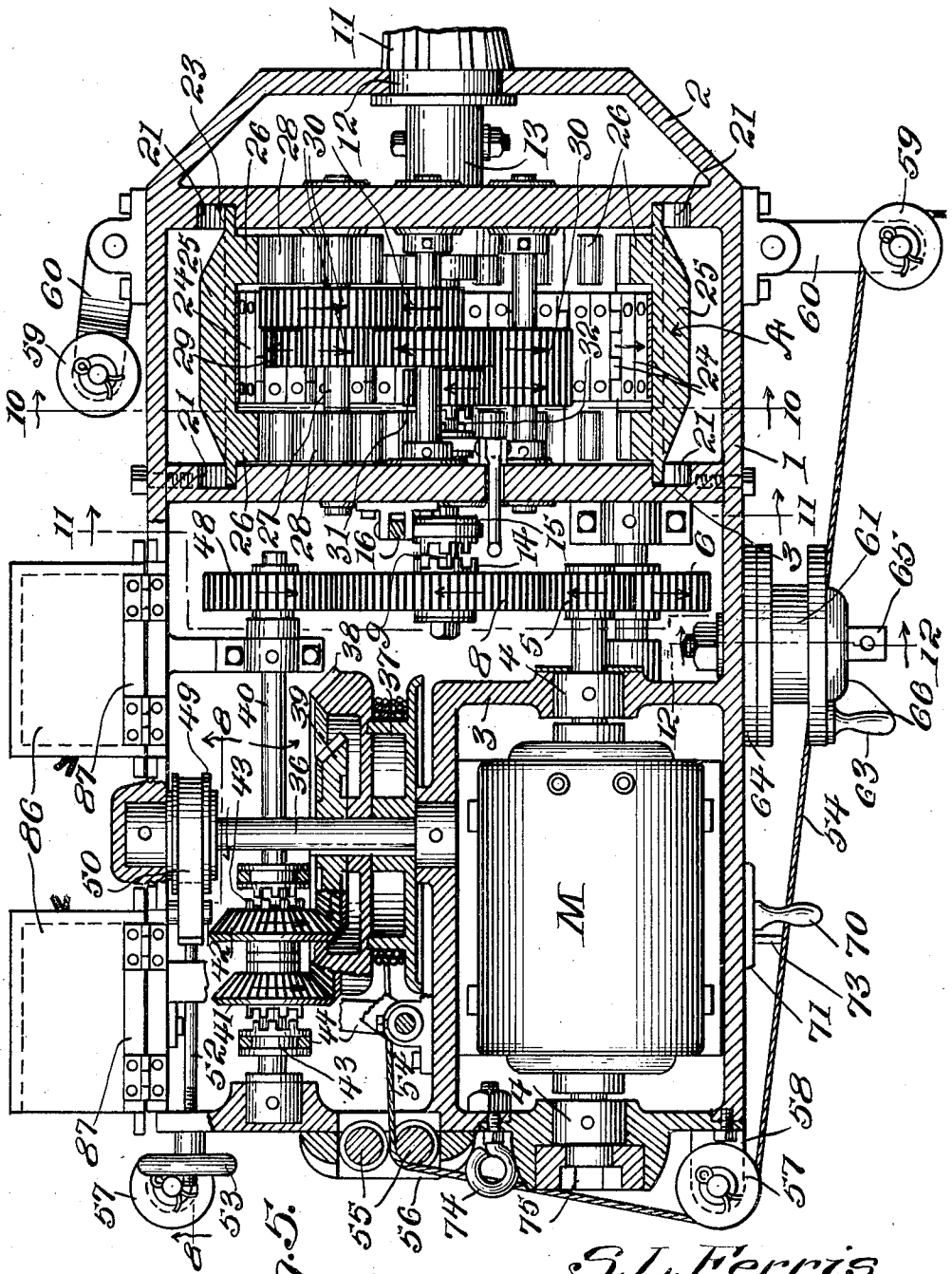


Fig. 5.

S. L. Ferris
INVENTOR

BY Victor J. Evans
ATTORNEY

J. L. L. Wright
WITNESS:

Nov. 3, 1931. S. L. FERRIS 1,830,267

MINING MACHINE

Filed Dec. 17, 1928 6 Sheets-Sheet 4

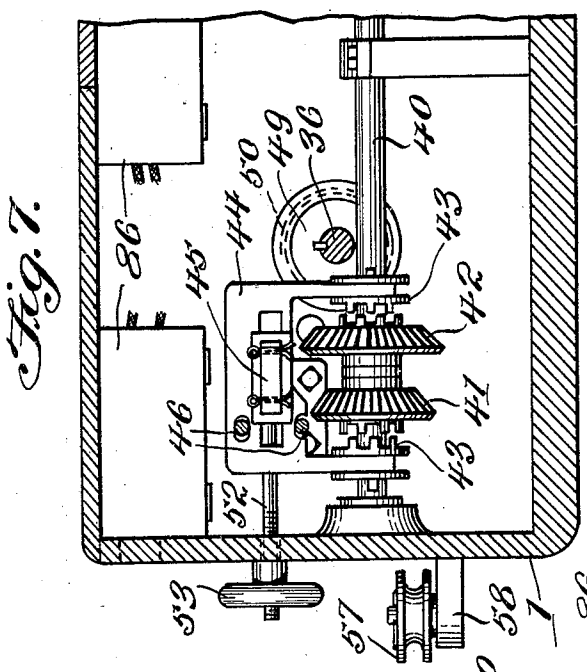


Fig. 7.

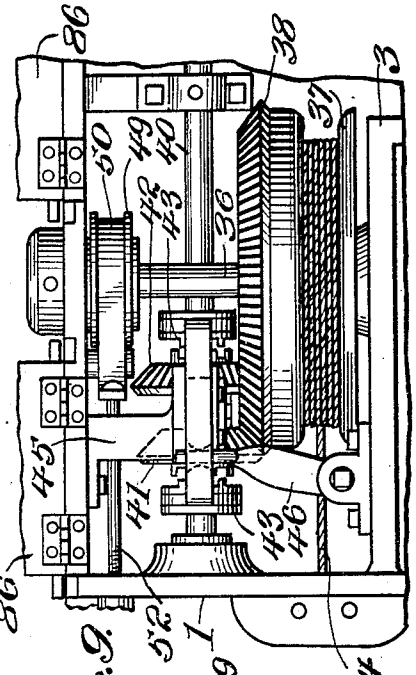


Fig. 9.

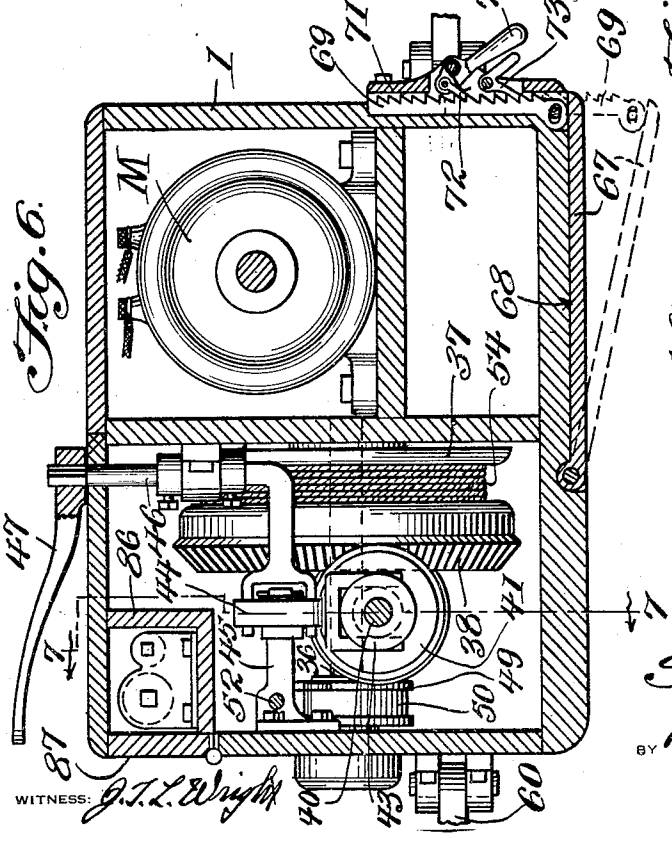


Fig. 6.

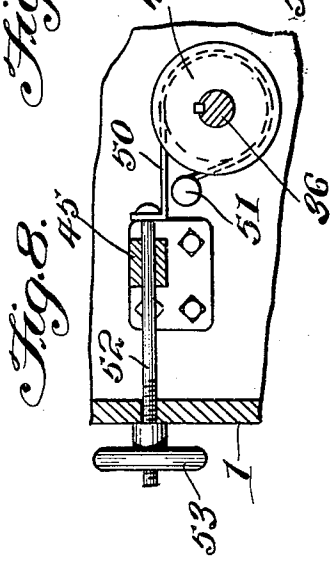


Fig. 8.

S. L. Ferris
INVENTOR

BY Victor J. Evans
ATTORNEY

WITNESS: J. L. Wright

Nov. 3, 1931. S. L. FERRIS 1,830,267

MINING MACHINE

Filed Dec. 17, 1928 6 Sheets-Sheet 5

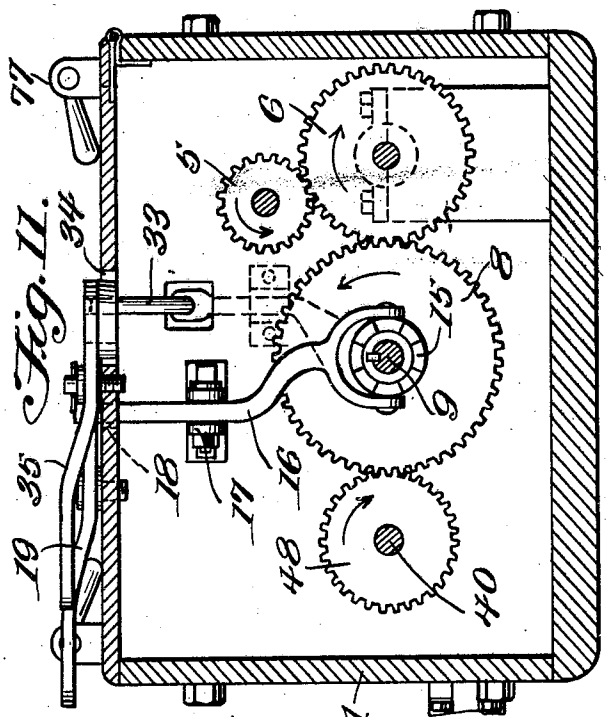


Fig. 11.

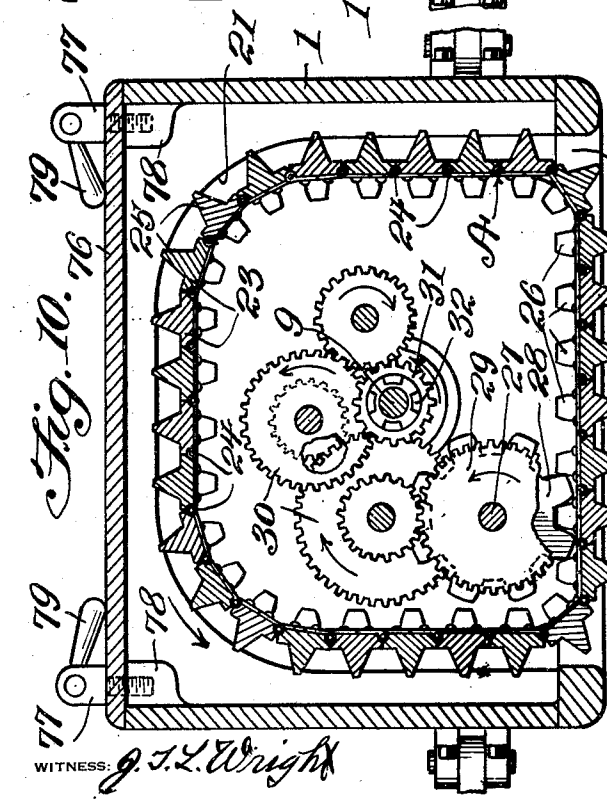


Fig. 10.

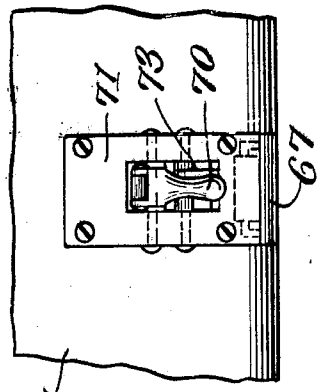


Fig. 14.

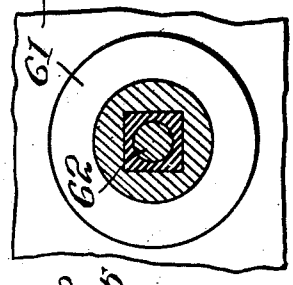


Fig. 13.

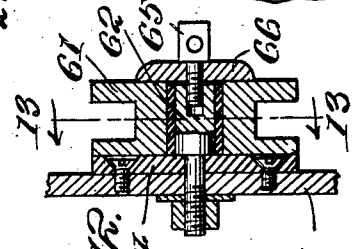


Fig. 12.

WITNESS: J. L. Wright

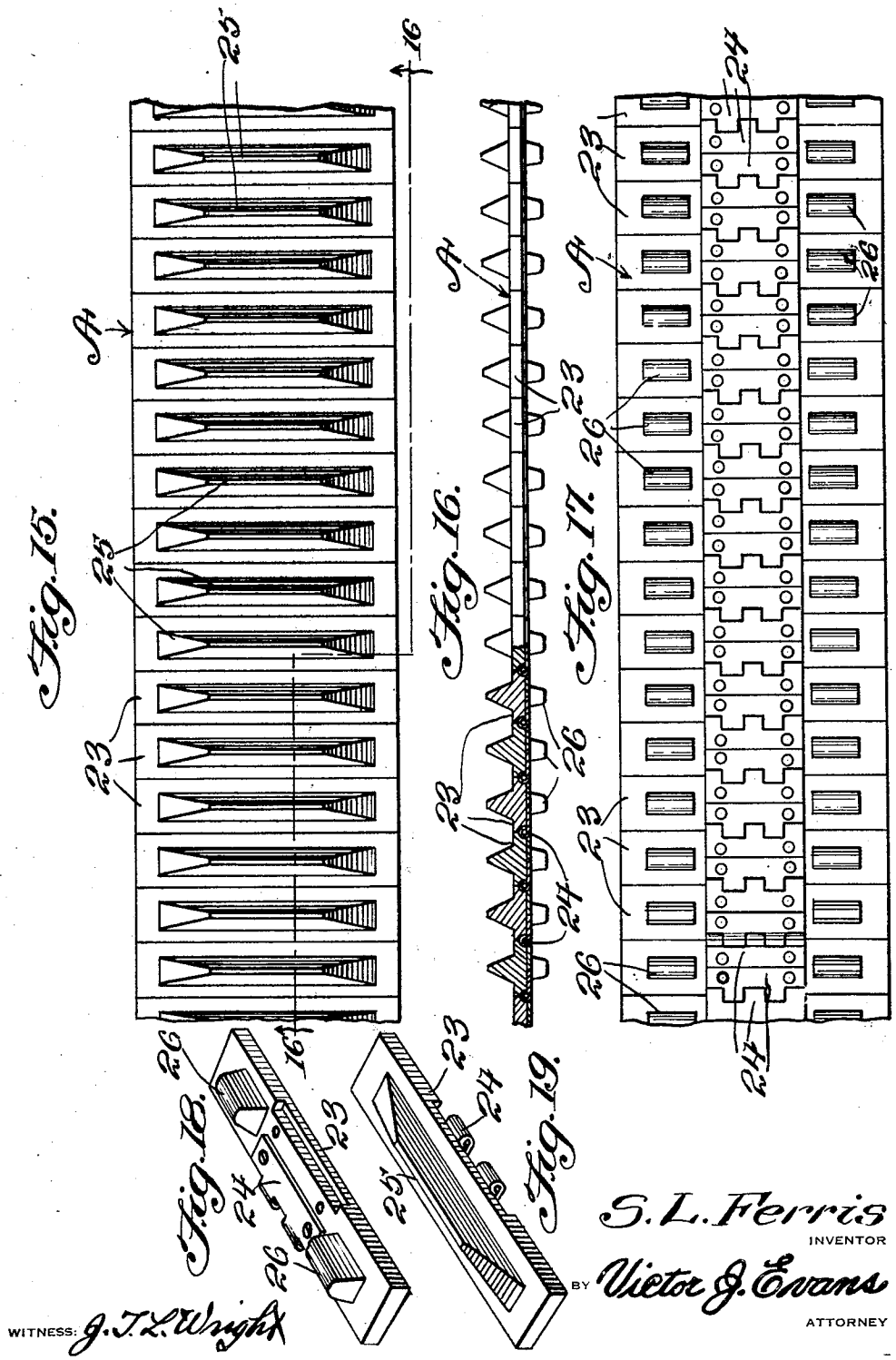
S. L. Ferris
INVENTOR

BY Victor J. Evans
ATTORNEY

Nov. 3, 1931. S. L. FERRIS 1,830,267

MINING MACHINE

Filed Dec. 17, 1928 6 Sheets-Sheet 6



S. L. Ferris
INVENTOR

BY Victor J. Evans
ATTORNEY

WITNESS: J. T. L. Wright

Patented Nov. 3, 1931 1,830,267

UNITED STATES PATENT OFFICE

SIDNEY L. FERRIS, OF DECOTA, WEST VIRGINIA

MINING MACHINE

Application filed December 17, 1928. Serial No. 326,622.

This invention relates to a mining machine, the general object of the invention being to provide means whereby a hole may be drilled into a wall and then a horizontal cut made in the wall so that the mining operations can be performed with the minimum amount of labor and time.

Another object of the invention is to provide means for moving the apparatus during the cutting operation by a motor within the body thereof, said motor also driving the auger.

A further object of the invention is to provide a drum within the body and driven from the motor and to which is attached a cable whereby the apparatus can be moved to its proper position adjacent the wall.

This invention also consists in certain other features of constructon and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claim.

In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is a top plan view of the apparatus.

Figure 2 is an elevation.

Figure 3 is a view of the rear end of the apparatus.

Figure 4 is a view of the side of the apparatus opposite to that shown in Figure 2.

Figure 5 is a horizontal sectional view with parts in plan.

Figure 6 is a section on line 6—6 of Figure 1.

Figure 7 is a section on line 7—7 of Figure 6.

Figure 8 is a section on line 8—8 of Figure 5.

Figure 9 is a fragmentary plan view of the drum and brake and the parts associated therewith.

Figure 10 is a section on line 10—10 of Figure 5.

Figure 11 is a section on line 11—11 of Figure 5.

Figure 12 is a section on line 12—12 of Figure 5.

Figure 13 is a section on line 13—13 of Figure 12.

Figure 14 is a fragmentary side view, showing the operating means for the leveling device.

Figure 15 is a fragmentary view of the endless member for imparting side movement to the apparatus.

Figure 16 is a section on line 16—16 of Figure 15.

Figure 17 is a fragmentary view of the inner face of the endless member.

Figure 18 is a perspective view of one of the links of the endless member, looking toward the inner part thereof.

Figure 19 is a similar view looking toward the outer part.

Figure 20 is a section on line 20—20 of Figure 1.

Figure 21 is a sectional view of the outer end of the auger showing the means for attaching the boring bit.

In these drawings, the numeral 1 indicates the casing-like body of the apparatus, which has a tapered front part 2 forming a chamber, and the casing is divided into other chambers by the partitions 3, these partitions and the walls of the casing having openings therein containing anti-friction bearings for the various shafts of the apparatus.

An electric motor M is arranged in one of the chambers of the apparatus, with its shaft extending through the walls of the chamber, anti-friction bearings 4 being arranged in said walls for the shaft. A pinion 5 is connected to the inner end of the shaft and this pinion meshes with a gear 6 arranged on a shaft 7 journaled in the casing, and this gear 6 meshes with a gear 8 loosely mounted on the propeller shaft 9 which passes through the front chamber and has a square end 10 fitting in a socket in the reduced inner end of the auger 11. This reduced end of the auger passes through holes in the extension 2 and the front wall of the casing, anti-friction bearings 12 being provided for said reduced end. A flanged sleeve 13 is bolted to the reduced end and bears against the extension 2

and the front wall and prevents end play of the auger.

A clutch part 14 is carried by the gear 8 and a clutch part 15 is slidably but non-rotatably arranged on the shaft 9, the clutch part 15 being shifted to operative and inoperative position by the clutch fork 16 pivoted to one of the partitions, as shown at 17, and having its upper end extending through a slot 18 in the top of the housing or casing. A lever 19 is pivoted to the top and has a slot 20 therein for engaging the upper end of the fork, whereby the fork can be moved by the lever. Thus the gear 8 can be engaged with or disengaged from the propeller shaft by this clutch means and it will, of course, be understood that when it is engaged, the auger will be driven from the motor.

The front walls of the front chamber are formed with the guiding grooves 21, each of substantially inverted U-shaped and an opening 22 is formed in the bottom of this chamber with which the ends of the grooves communicate. An endless chain A, composed of a plurality of plate-like links 23 connected together by the hinges 24, has its edges engaging the grooves, with its lower reach passing across the opening. Each link is formed with an elongated beveled rib 25 on its outer face and with a pair of teeth 26 on its inner face, as shown in Figures 18 and 19. The teeth are arranged on each side of the hinge.

A shaft 27 has its ends journaled in the front and rear walls of the front chamber, and this shaft carries a pair of toothed wheels 28, the teeth of which engage the teeth 26 of the endless member, whereby when the shaft is rotated, the endless member will be moved and as the ribs 25 of the endless member engage the floor of the mine, this movement of the endless member will move the apparatus sidewise. A gear 29 is fastened to the shaft 27 and a train of gears 30 connects this gear with a gear 31 loosely arranged on the propeller shaft 9. A clutch, shown generally at 32, is provided for connecting the gear 31 with the propeller shaft when it is desired to actuate the endless member from the motor and the clutch fork 33 of this clutch passes through a slot 34 in the top of the casing and is shifted by means of a lever 35 pivoted to the top of the casing and having a slot in one end for engaging the upper end of the link.

A transversely arranged shaft 36 is arranged in the casing and has keyed thereto a drum 37, a ring gear 38 and a small gear 39. A shaft 40 is journaled in the casing and extends at right angles to the shaft 36 and this shaft 40 has attached thereto the gears 41 and 42, the gear 41 meshing with the gear 38 and the gear 42 with the gear 39. These gears 41 and 42 are provided with clutch parts and a pair of clutch members 43 are slidably but non-rotatably mounted on the shaft 40 so that either one of the gears 41 or 42 can be connected with and driven from the shaft 40.

A yoke-shaped member 44 has its limbs formed with forks for engaging the forked members 43, this member being slidably supported on a stud 45 in the casing and a forked member 46 has its prongs passing through two holes in the yoke member 44. This member is rotatably supported in the casing and has its upper end passing through the top of the casing, with a handle 47 detachably connected with its upper end so that by moving this handle, the yoke member 44 can be shifted to place either clutch part 43 in engagement with the clutch part of either gear 41 or 42, it being understood that when one clutch part 43 is moved into operative position, the other part 43 is moved into inoperative position. This arrangement permits the drum to be driven at two different speeds from the shaft 40. A gear 48 is fastened to the shaft 40 and this gear meshes with the gear 8 so that the shaft 40 is driven from the motor.

A brake drum 49 is keyed to the shaft 36 and a spring band 50 passes over the drum. One end of the band is attached to a wall of the casing, as shown at 51, and the other end of the band is connected to the inner end of a shaft 52 which passes through the rear end of the casing, this end being threaded to receive the threaded hub of a hand wheel 53 whereby by turning the wheel, the shaft 52 can be moved longitudinally to tighten the band on the drum and thus prevent movement of the shaft 36 and the drum 37 or by turning the hand wheel in the opposite direction, the spring band 50 can be released from the drum 49 to permit turning movement of the shaft 36.

A cable 54 has one end attached to the drum and its other end is adapted to be anchored in any suitable manner in the mine. This cable passes between the vertically arranged rollers 55 arranged in an opening 56 formed in the rear part of the casing and it passes over a pulley 57 carried by the bracket 58 attached to the rear end of the casing and it also passes over a pulley 59 carried by the arm 60 which is pivoted to one side of the casing at the front thereof. As will be seen, a set of the pulleys 57 and 59 is placed at each side of the casing so that the cable can be attached to an anchor at either side of the apparatus. By attaching the pulley 59 to the pivoted arm 60, the pulley will adjust itself during the movement of the apparatus and this also permits the arm and pulley to be swung out of the way when not in use.

The eye bolt 74 can be used for fastening the apparatus on a truck.

From the foregoing it will be seen that the winding of the cable on the drum will cause the apparatus to be moved sidewise toward that side of the mine to which the

cable is anchored. If desired, the cable can be anchored at a point either in front or in rear of the apparatus so as to move the apparatus either forwardly or rearwardly, or by anchoring the cable to a point to one side of the rear end of the apparatus, the rear end of the apparatus can be swung to one side or the other. After the apparatus has been properly positioned by the winding of the cable on the drum, the brake is tightened to prevent unwinding of the drum.

A second drum 61 is rotatably arranged on a stud 62 connected with an exterior side of the casing, this drum being provided with a handle 63 whereby it can be turned. A cable may be attached to this drum and anchored either in front or in rear of the apparatus so that by turning the drum by hand, the apparatus can be moved forwardly or rearwardly without operating the motor. This cable can also be used to prevent movement of the apparatus when the same is in operation. A friction plate 64 is fastened to the side of the casing and engages the inner face of the drum when a bolt 65, engaging a threaded socket in the stud 62, is turned, a friction member 66 being caused to engage the outer face of the drum when this bolt is tightened. Thus when the bolt is tightened, the drum 61 is clamped against movement and thus the drum will be prevented from turning against the pull of the cable.

A leveling pla e 67 is hinged to the bottom of the casing at one side thereof and adjacent the rear end, the bottom being recessed, as shown at 68, to receive the plate when the same is in closed position. This plate is swung outwardly, as shown in dotted lines in Figure 6, by a rack bar 69 having a slot and pin connection with the outer end of the plate, the rack bar being moved by the oscillation of a handle 70 pivoted to the housing 71 of the rack bar and carrying the dog 72 which will engage the teeth of the rack bar when the handle is moved. A holding dog 73 is carried by the housing for holding the rack bar in adjusted position. It is simply necessary to release the holding dog in order to permit the leveling plate to return to its normal position in the recess. This arrangement permits the apparatus to be leveled when the mine floor is not level. As many of these plates can be provided as are necessary.

An eye bolt 74 is attached to the rear end of the apparatus so that a cable may be attached thereto and attached to an engine, tractor or winch, to move the apparatus, and a coupling 75 is fastened to the rear end of the motor shaft and is located in a socket in the rear end of the casing so that a driven shaft can be connected to this coupling and the winch or other apparatus driven from the motor, thus affording a convenient means of moving the apparatus upon a car or truck by the motor of the apparatus when the apparatus is to be moved from one place to another.

The top of the casing is composed of a plurality of doors 76, some of which may be hinged and the others bodily removable and these doors are held in closed position by the bolts 77 passing through holes in the doors and engaging socketed members 78 attached to the interior walls of the casing. Each bolt is provided with a handle 79 so that it can be turned without the use of a wrench. By making the clutch handles 19, 35 and 47 removable, these doors can be opened without interference from such handles.

Boxes 86 are attached to the doors 87 placed in one side of the casing, one box being adapted to contain the coil of the circuit of the motor and the other box containing the controlling parts of the motor, the handles 88 of these controlling parts extending through the rear of the casing. These controlling parts control the speed of the motor and the reversing of the same.

A hinged cover 89 is provided for the chamber formed by the extension 2 so that access can be had to the parts within the chamber, and I prefer to place an oil receptacle in said chamber which is connected by pipes to the various parts, though the parts can be lubricated in any desired manner.

The auger 11 is of tapered shape and is formed with the longitudinally extending spiral ribs 80, each rib having a row of holes therein for receiving the bits 81 which are removably fastened in the holes by the set screws 82. A boring bit 83 has its shank fitting in a socket 84 formed in the outer end of the auger and is removably held in place by the set screw 85.

From the foregoing it will be seen that when the motor is connected with the propeller shaft, the auger will be rotated and the endless member A will be moved, though this member can be disconnected from the propeller shaft by its clutch so that the auger can be actuated alone. The auger is first actuated to cause it to bore a hole in the mine face and then the clutch of the endless member is thrown into operative position so that this member will move the front end of the device sideways and thus cause the rotating auger to make a horizontal cut in the mine face. After the cut has been made, the apparatus can be moved rearwardly by attaching the cable 54 to an anchor at the rear of the apparatus and the apparatus is moved to the opposite side of the mine to make a new cut by passing the cable over the pulley 59 and anchoring it to one side of the apparatus. It will, of course, be understood that when the drum 37 is to be actuated from the motor, the propeller shaft has its clutch moved to inoperative position.

It is thought from the foregoing description that the advantages and novel features

of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claim.

What I claim is:—

A mining machine comprising a casing, a drilling element carried by the front wall of the casing, a compartment formed in the casing adjacent the front wall and having grooves formed in the front and rear walls thereof to provide tracks, the bottom of the casing under said compartment cut away to expose the ends of the tracks, an endless member mounted on the tracks and having one run in engagement with the ground, a second compartment located at one corner and at the rear of the casing, a power source located in the second compartment, driving means connected to the power source and located between the compartments within the casing, control means connecting the drilling element to said driving means, means actuating the endless member by said control means, a drum journalled in the casing between the second compartment and the rear and one side wall of the casing, an anchoring cable connected to the drum and extending outwardly of the casing through the rear wall thereof for attachment to an anchor, means actuating the drum at either of two speeds from said drive means, guide means at each side of the casing over which the cable may be trained, and an elevating means on said casing adjacent the power source.

In testimony whereof I affix my signature.

S. L. FERRIS.