

Feb. 14, 1933.

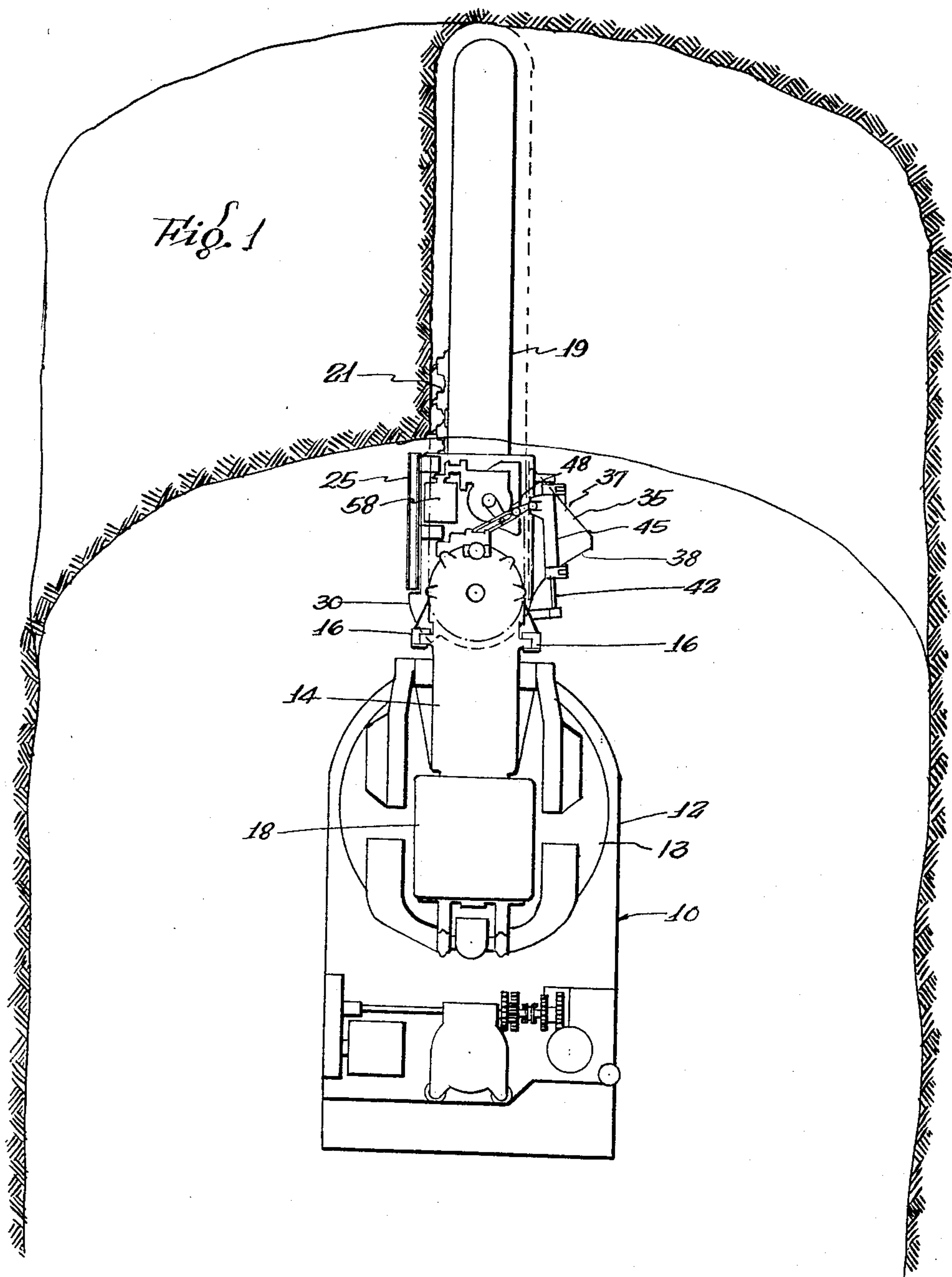
F. A. LINDGREN

1,897,984

MINING MACHINE

Original Filed June 3, 1929

3 Sheets-Sheet 1



Inventor
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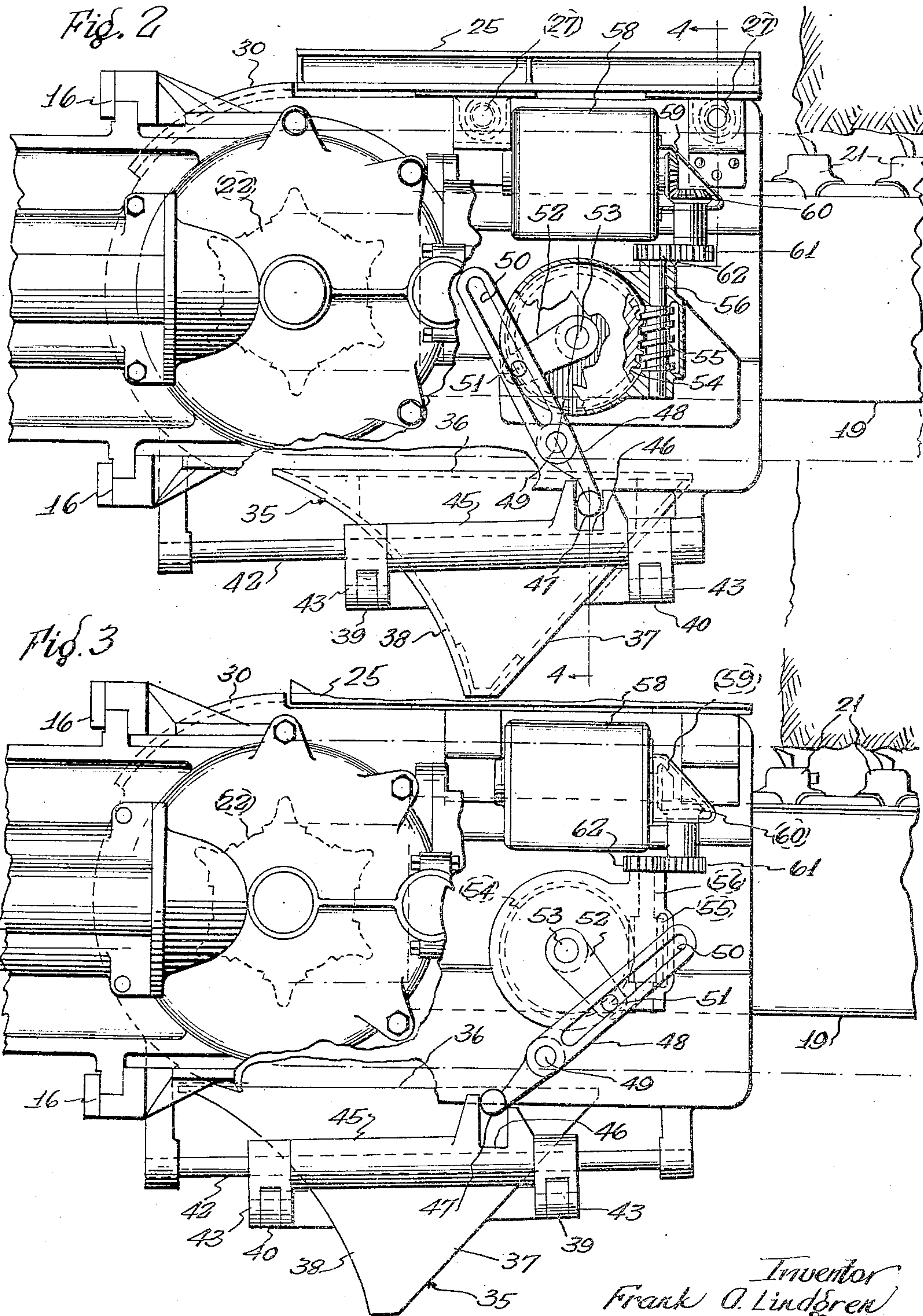
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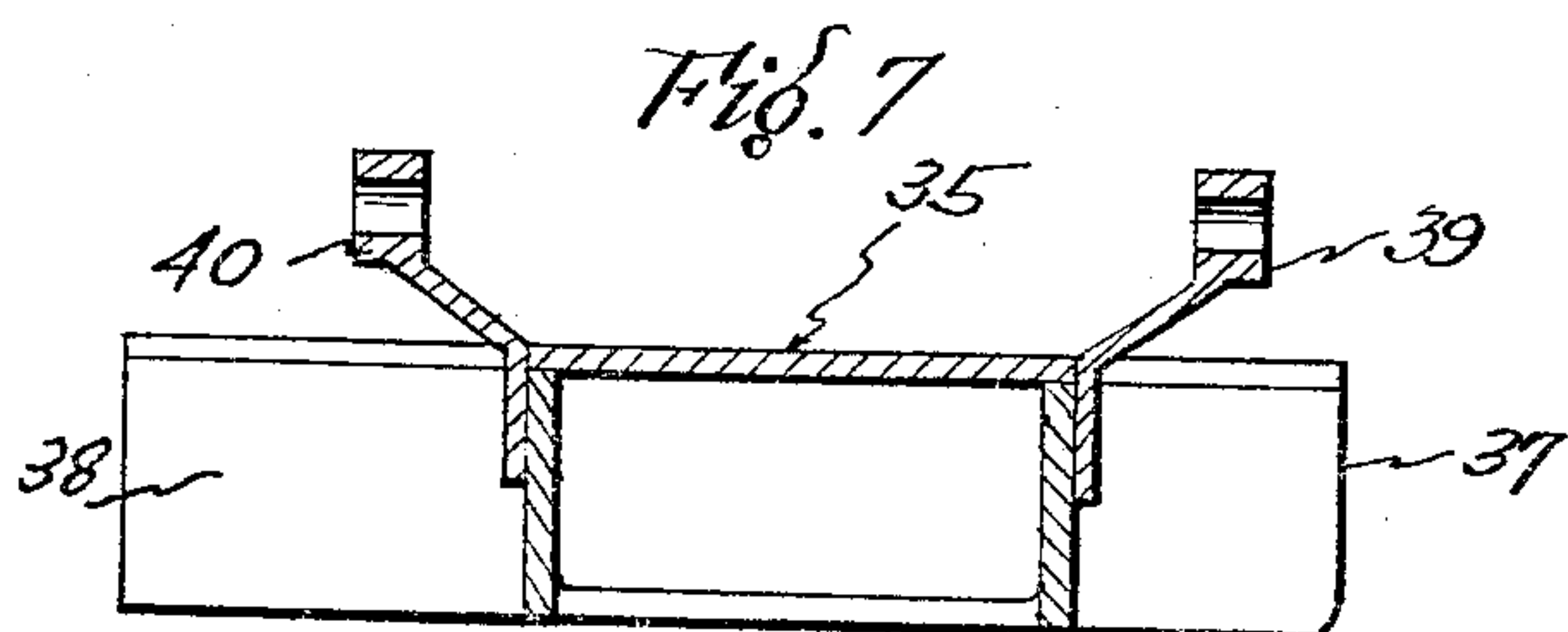
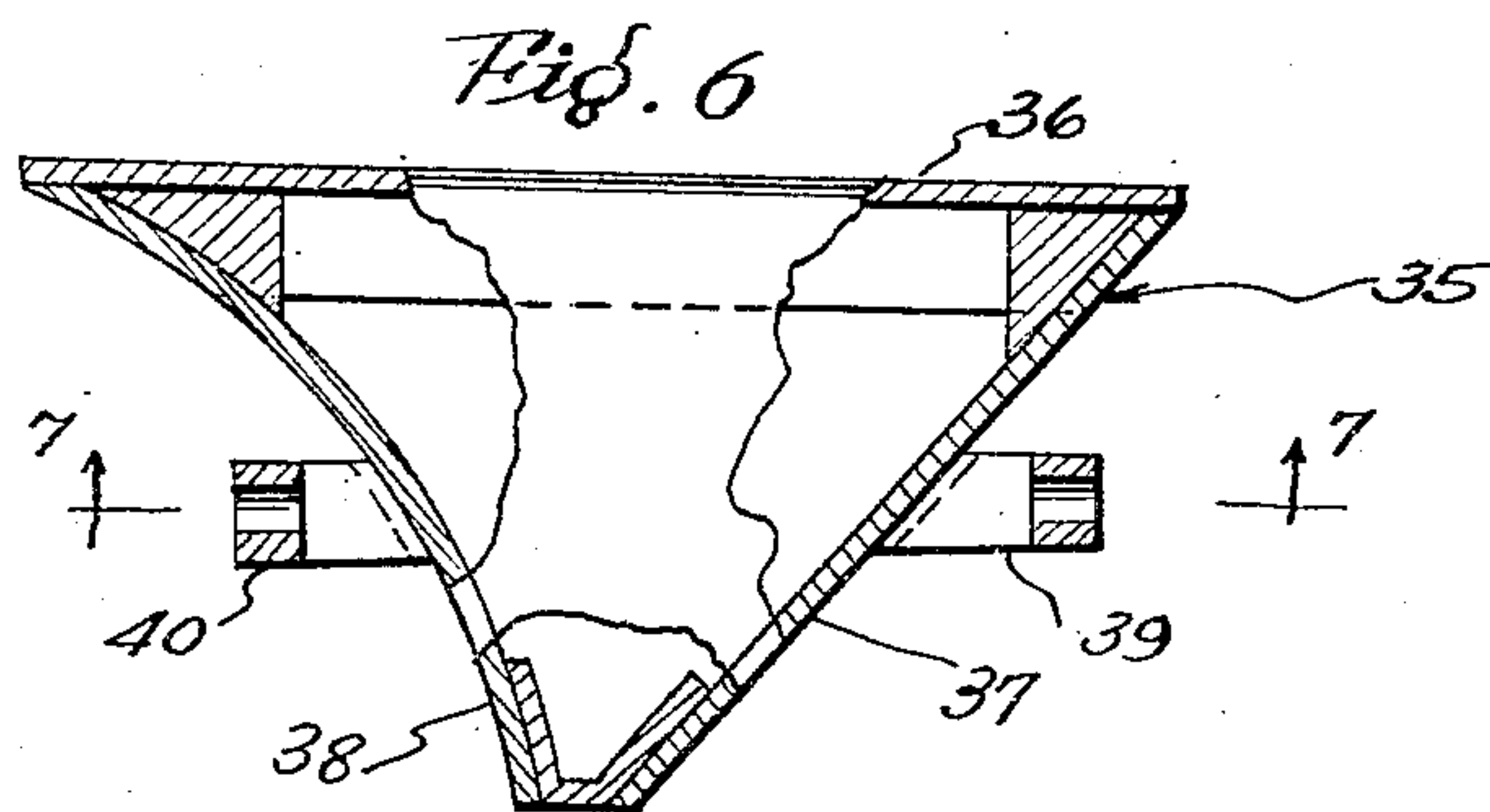
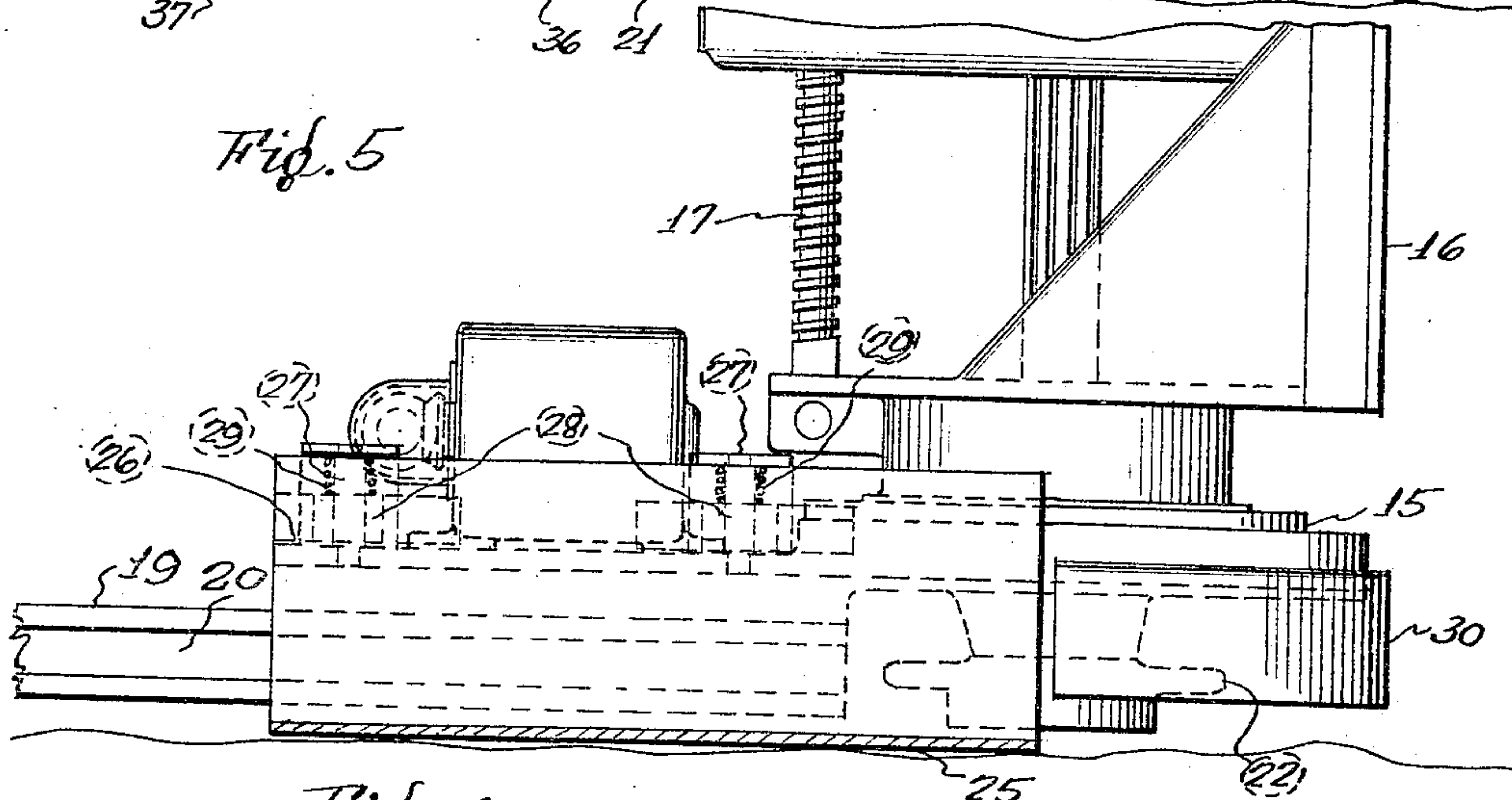
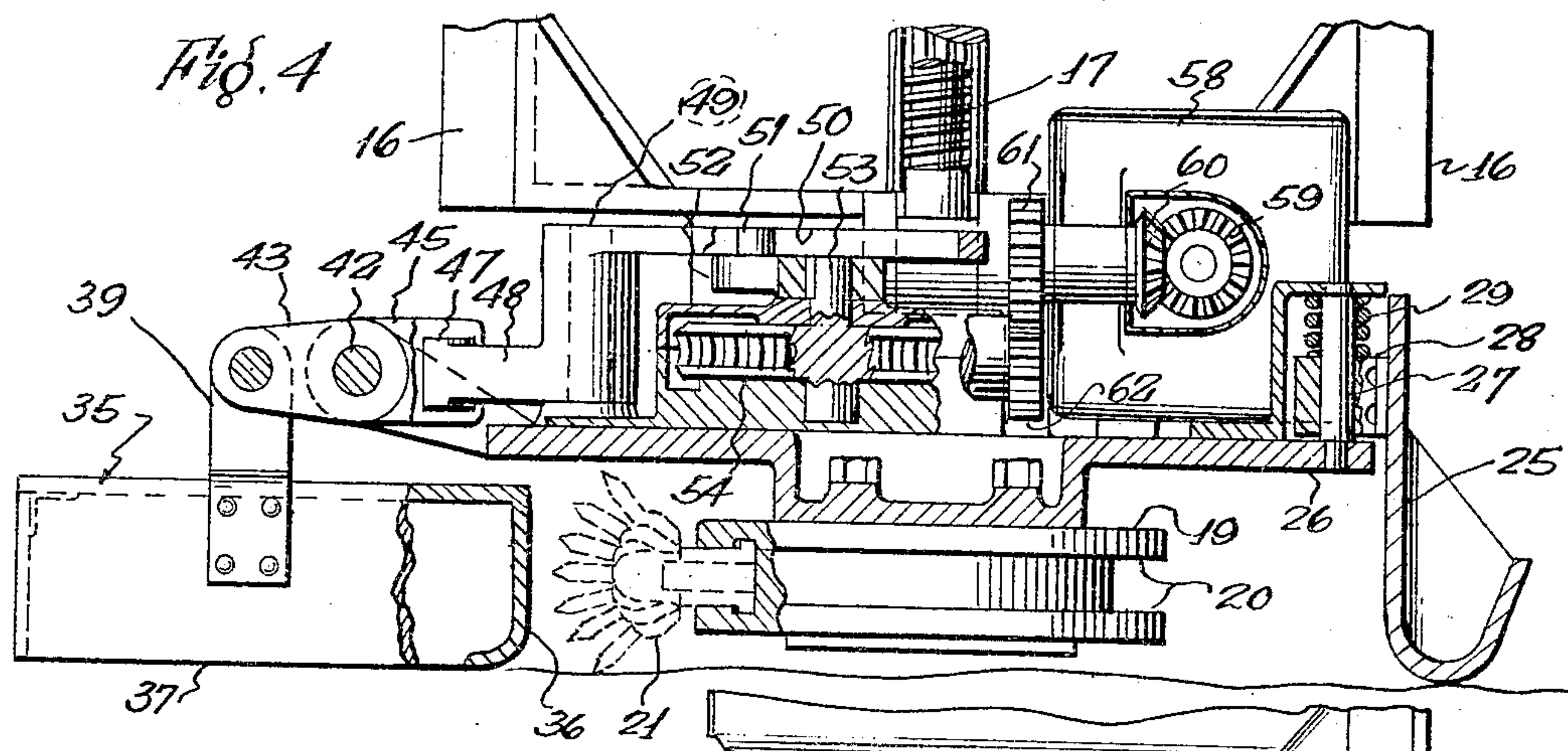
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UNITED STATES PATENT OFFICE

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MINING MACHINE

Application filed June 3, 1929, Serial No. 367,851. Renewed May 28, 1932.

This invention relates to improvements in mining machines and has for its principal object to provide a means for clearing the cuttings from the path of the cutter bar in a machine of the arcwall or slabbing type adapted to cut a kerf in the mine wall at or near the mine bottom.

The present invention provides mechanically operable means for clearing the cuttings from the path of the cutter bar to more efficiently keep the path of the cutter bits clear of loose cuttings as said bits enter the kerf in the coal face.

Other objects of my invention will appear from time to time as this specification proceeds.

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

Figure 1 is a top plan view of a mining machine of the slabbing type cutting a kerf in a mine wall and having my invention embodied thereon;

Figure 2 is an enlarged fragmentary plan view of a mining machine of the slabbing type with parts broken away and in section to more clearly show the details of my invention;

Figure 3 is an enlarged fragmentary plan view of the mining machine shown in Figure 1 with the cuttings deflector in another position than is shown in Figure 2;

Figure 4 is a sectional view taken on line 4—4 of Figure 2;

Figure 5 is a fragmentary side elevation of the mining machine shown in Figure 1;

Figure 6 is an enlarged horizontal sectional view of the cuttings deflector; and

Figure 7 is a sectional view taken on line 7—7 of Figure 6.

Like numerals refer to like parts throughout the various figures.

In the embodiment of my invention as illustrated, my invention is shown as applied to a mining machine 10 of the slabbing type which is adapted to cut a kerf in a mine wall at the mine bottom or at various elevations with respect thereto.

The mining machine herein illustrated is similar to that shown in an application bear-

ing Serial Number 344,616, filed by William T. McCullough, on March 6, 1929, and will not herein be described in detail excepting as to parts which pertain particularly to my invention.

Said machine comprises a wheeled truck 12 having a turntable 13 thereon, which turntable in turn has a cutting element 14, herein shown as trunnioned near the forward portion of said turntable.

The cutting element 14 has a cutter head 15 depending therefrom and vertically adjustable with respect thereto in guides 16, 16. A threaded shaft 17 driven by a motor 18 on the rearward portion of the cutting element 14 in a suitable manner not herein described is provided to move the cutter head 15 in the guides 16, 16. A cutter bar 19 extends longitudinally forward from the cutter head 15 and is provided with guides 20 for receiving a cutter chain 21 which is movable thereabout. The cutter chain 21 is driven by a sprocket 22 from the motor 18 in its various positions of adjustment with respect to the cutting element through a suitable gear train which will not herein be described since it is no part of my invention.

A cutting guide 25 is disposed on the advance side of the cutter bar 19. The cuttings guide 25 has a curved bottom portion and is yieldably mounted on a cutter bar supporting member 26 so as to be vertically movable with respect to said supporting member and ride over an uneven mine bottom. The cuttings guide 25 is yieldably mounted on the support 26 by means of a plurality of pins 27 held in a vertical position in the supporting member 26 which pass through members 28 fixed to the deflector 25 to support said deflector for vertical movement on said pins. A spring 29 is interposed between each member 28 and the upper support for the pin 27 to hold the cuttings guide 25 in an extreme downward position at all times, thus holding said cuttings guide in engagement with the mine bottom and allowing said cuttings guide to move vertically when passing over a rough or uneven mine bottom.

An arcuate deflector 30 depends from the cutter head 15 and extends from the rearward

portion of the deflector 25 rearwardly around the cutter head 15 conforming to the path of the cutter chain 21 to cooperate with said cutter chain so that said cutter chain may expel the cuttings from the mining machine to the retreating side of the cutter head 15.

Referring now more particularly to the subject matter of the present invention, I provide means for clearing the cuttings from the cutter chain on the retreating side of the cutter bar 19, which herein comprises a reciprocally movable cuttings deflector 35 movable longitudinally of said cutter bar. An inner side 36 of the cuttings deflector 35 extends substantially longitudinally of the cutter bar 19 and has a curved bottom portion to guide the deflector 35 over a rough mine bottom on transverse movement of the cutter bar 19. A forward side 37 of the cuttings deflector 35 extends rearwardly with respect thereto at an acute angle to the inner side 36 of the deflector 35. A rearward side 38 of the cuttings deflector 35 is of an arcuate shape and extends forwardly with respect thereto at an acute angle with respect to the inner side 36 of the deflector 35 so as to form a plow like surface to propel the cuttings away from the cutter chain 21 on reciprocable movement of the cuttings deflector 35. It may be seen with reference to Figures 1 and 2 that the side 38 of the deflector 35 is so shaped and arranged with respect to the cutter chain 21 that said side tends to deflect the cuttings from the cutter chain even when the deflector is in a stationary position. It may here also be seen that the cuttings deflector 35 is of substantially a triangular shape and that the forward side 37 and rearward side 38 of the cuttings deflector 35 may both propel the cuttings from the path of the cutter chain on reciprocable movement of the deflector 35.

The deflector 35 may be supported for reciprocable movement with respect to the cutter bar 19 and reciprocated in any suitable manner, said deflector as herein shown being supported on members 39 and 40 which project upwardly from the sides 37 and 38 of the deflector 35, respectively, and are connected to a rod 42 by means of links 43, 43, slidable on said rod and pivotally connected to the members 39 and 40. The rod 42 is supported outwardly from the cutter bar 19 and is spaced closer to said cutter bar at its forward end than at its rearward end so as to guide the deflector 35 in an outward direction as said deflector is moved rearwardly along the rod 42 and thus aid in deflecting the cuttings outwardly from the cutter bar 19. A member 45 is interposed between the links 43, 43, and is reciprocally movable along the rod 42. A forked portion 46 projects inwardly toward the cutter bar 19 from the member 45 and serves as a guide for a rider 47 on the end of an arm 48. The arm 48 is pivotally

connected to the top portion of the cutter bar supporting member 26 at 49 for pivotal movement about a vertical axis and has a slot 50 therein on the opposite side of the pivotal axis 49 of the arm 48 from the rider 47. A pin 51 on the end of a crank 52 rides in the slot 50 so that rotation of said crank will reciprocally move the arm 48 about its pivotal axis. The crank 52 is keyed on the end of an upright shaft 53 journaled in the cutter bar supporting member 26. A worm gear 54 is fixed to the shaft 53 and is driven by a worm 55 on a transverse shaft 56. The worm 55 and transverse shaft 56 are driven from a motor 58 on the supporting member 26 by means of a bevel motor pinion 59, bevel pinion 60, spur gear 61 and spur gear 62 keyed on the transverse shaft 56. In looking at Figures 2 and 3 it may clearly be seen that rotation of the crank 52 causes reciprocable movement of the member 40 about its pivotal axis 49 which reciprocally moves the member 45 and cuttings deflector 35 along the rod 42.

Looking now in particular at Figure 1 showing a mining machine of the type embodying my invention cutting a kerf in a mine wall it may be seen that the cuttings are deflected in the path of the reciprocally movable cuttings deflector 35 by means of the cuttings guide 25 and arcuate deflector 30 in cooperation with the cutter chain 21, and are propelled away from said cutter chain by means of the reciprocally movable cuttings deflector 35. When the cutter bar 19 is making a cut such as is shown in Figure 1 movement of the cutter head is very slight compared with the width of the kerf cut. It may be seen that where no means for deflecting the cuttings away from the path of the cutter chain is provided that the cuttings will tend to collect in the path of the cutter chain and retard the progress of the cutter bar and be propelled back into the kerf by means of the cutter chain. Due to the danger of removing the cuttings by hand it is impractical to employ hand labor to remove said cuttings from the path of the cutter chain. The device of my invention therefore provides mechanically operable means cooperating with the cutter chain for removing the cuttings from the path of said cutter chain.

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

I claim as my invention:

1. In combination with a truck mounted

mining machine having a depending cutter head, a cutter bar projecting forwardly therefrom adapted to cut an arcuate kerf adjacent the mine bottom and having a cutter chain movable thereabout, and means operated independently of said cutter chain for clearing the cuttings from said cutter chain comprising a cuttings deflector reciprocally movable along said cutter bar.

2. In combination with a mining machine, a main frame, a cutter bar projecting forwardly therefrom adapted to cut a kerf adjacent the mine bottom and having a cutter chain movable thereabout, and means operated independently of said cutter chain for clearing the cuttings from the retreating side of said cutter bar comprising a cuttings deflector reciprocally movable along the retreating side of said cutter bar.

3. In combination with a mining machine, a main frame, a cutter bar projecting forwardly therefrom adapted to cut a kerf adjacent the mine bottom and having a cutter chain movable thereabout, and means operated independently of said cutter chain for clearing the cuttings from the retreating side of said cutter bar comprising a cuttings deflector movable longitudinally of said cutter bar on the retreating side thereof.

4. In combination with a mining machine, a main frame, a cutter bar projecting forwardly therefrom adapted to cut a kerf adjacent the mine bottom and having a cutter chain movable thereabout, and means operated independently of said cutter chain for clearing the cuttings from the retreating side of said cutter bar comprising a cuttings deflector reciprocally movable longitudinally of said cutter bar on the retreating side thereof.

5. In combination with a mining machine, a main frame, a cutter bar projecting forwardly therefrom adapted to cut a kerf adjacent the mine bottom and having a cutter chain movable thereabout, and means operated independently of said cutter chain for clearing the cuttings from the retreating side of said cutter bar comprising a cuttings deflector engageable with the mine bottom and reciprocally movable longitudinally of said cutter bar on the retreating side thereof.

6. In combination with a truck mounted mining machine having a depending cutter head, a cutter bar projecting forwardly therefrom and adapted to cut a kerf adjacent the mine bottom, and means for clearing the cuttings from said cutter bar comprising a reciprocally movable cuttings deflector and a motor supported on said cutter bar for reciprocally moving said cuttings deflector.

7. In combination with a truck mounted mining machine having a depending cutter head, a cutter bar projecting forwardly therefrom and adapted to cut a kerf adjacent

cent the mine bottom, a cutter chain movable about said cutter bar, means cooperating with said cutter chain for expelling the cuttings beyond the retreating side of the machine comprising a cuttings guide extending along the advance side of said cutter bar for a portion of its length and arcuately around the rearward portion of said cutter bar, and means for clearing the cuttings from the retreating side of said cutter bar comprising a reciprocally movable cuttings deflector on the retreating side of said cutter bar.

8. In combination with a truck mounted mining machine having a depending cutter head, a cutter bar projecting forwardly therefrom and adapted to cut a kerf adjacent the mine bottom, a cutter chain movable about said cutter bar, means cooperating with said cutter chain for expelling the cuttings beyond the retreating side of said machine comprising a cuttings guide yieldably mounted on the advance side of the cutter bar and engageable with the mine bottom, a second deflector extending arcuately around the rearward portion of the cutter bar, and means for clearing the cuttings from the retreating side of said cutter bar comprising a reciprocally movable cuttings deflector on the retreating side of said cutter bar.

9. In combination with a truck mounted mining machine having a depending cutter head, a cutter bar projecting forwardly therefrom and adapted to cut a kerf adjacent the mine bottom, a cutter chain movable about said cutter bar, means cooperating with said cutter chain for expelling the cuttings beyond the retreating side of said machine comprising a cuttings guide yieldably mounted on the advance side of the cutter bar and engageable with the mine bottom, a second deflector extending arcuately around the rearward portion of the cutter bar, and means for clearing the cuttings from the retreating side of said cutter bar comprising a cuttings deflector engageable with the mine bottom and reciprocally movable longitudinally of said cutter bar on the retreating side thereof.

10. In combination with a truck mounted mining machine having a depending cutter head, a cutter bar projecting forwardly therefrom and adapted to cut a kerf adjacent the mine bottom, means for clearing the cuttings from said cutter bar comprising a supporting member extending longitudinally of said cutter bar on the retreating side thereof, and a cuttings deflector pivotally mounted on said supporting member and reciprocally movable therealong.

11. In combination with a truck mounted mining machine having a depending cutter head, a cutter bar projecting forwardly therefrom and adapted to cut a kerf adjacent the

mine bottom, means for clearing the cuttings from said cutter bar comprising a supporting member extending along said cutter bar on the retreating side thereof, the forward portion of said supporting member being closer to said cutter bar than the rearward portion of said supporting member, and a cuttings deflector pivotally mounted on said supporting member and reciprocally movable therealong.

12. In combination with a truck mounted mining machine having a depending cutter head, a cutter bar projecting forwardly therefrom and adapted to cut a kerf adjacent the mine bottom, means for clearing the cuttings from said cutter bar comprising a motor on said cutter bar, a supporting member extending along said cutter bar on the retreating side thereof, a cuttings deflector pivotally mounted on said supporting member and reciprocally movable therealong, and means driven by said motor for reciprocally moving said deflector along said supporting member.

13. In combination with a truck mounted mining machine, a turntable, a depending cutter head supported by said turntable, a chain carrying cutter bar projecting forwardly therefrom adapted to cut an arcuate kerf adjacent the mine bottom, and means for clearing the cuttings from said cutter bar comprising a cuttings deflector reciprocally movable along said cutter bar.

14. In combination with a truck mounted mining machine, a turntable, a depending cutter head supported by said turntable, a chain carrying cutter bar projecting forwardly therefrom adapted to cut an arcuate kerf adjacent the mine bottom, and means for clearing the cuttings from said cutter bar comprising a cuttings deflector reciprocally movable along the retreating side of said cutter bar.

15. In combination with a truck mounted mining machine, a turntable, a depending cutter head supported by said turntable, a chain carrying cutter bar projecting forwardly therefrom adapted to cut an arcuate kerf adjacent the mine bottom, and means for clearing the cuttings from said cutter bar comprising a cuttings deflector movable longitudinally of said cutter bar on the retreating side of said cutter bar adjacent the rearward end thereof.

16. In combination with a truck mounted mining machine, a turntable, a depending cutter head supported by said turntable, a chain carrying cutter bar projecting forwardly therefrom adapted to cut an arcuate kerf adjacent the mine bottom, and means for clearing the cuttings from said cutter bar comprising a cuttings deflector reciprocally movable longitudinally of said cutter bar on the retreating side of said cutter bar adjacent the rearward end thereof.

17. In combination with a track mounted mining machine, a projecting chain carrying cutter bar adapted to cut an arcuate kerf adjacent the mine bottom, and means for clearing the cuttings from the path of said cutter bar comprising a cuttings deflector operated independently of the chain on said chain carrying cutter bar and movable along the retreating side of said cutter bar.

18. In combination with a track mounted mining machine, a projecting chain carrying cutter bar adapted to cut an arcuate kerf adjacent the mine bottom, and means for clearing the cuttings from the path of said cutter bar comprising a cuttings deflector mounted on and movable with said cutter bar and having a portion adapted to slidably engage the mine bottom and be moved along the retreating side of said cutter bar independently of said cutter bar for discharging the cuttings beyond said cutter bar in cooperation with the cutter chain on said cutter bar.

Signed at Chicago, in the county of Cook and State of Illinois, this 25th day of May, A. D. 1929.

FRANK A. LINDGREN.

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