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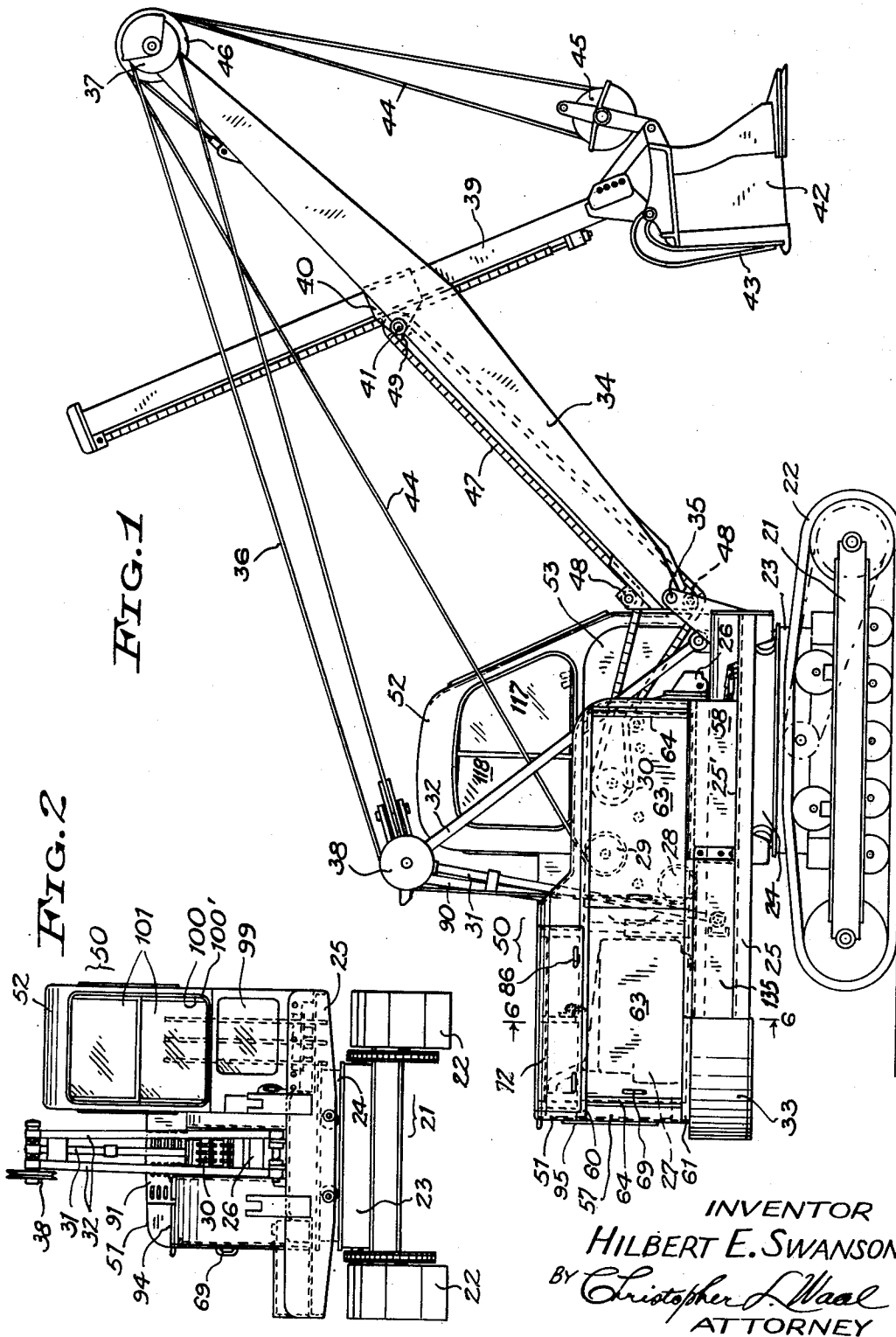
H. E. SWANSON

2,529,200

MATERIAL HANDLING MACHINE

Filed May 14, 1945

4 Sheets-Sheet 1



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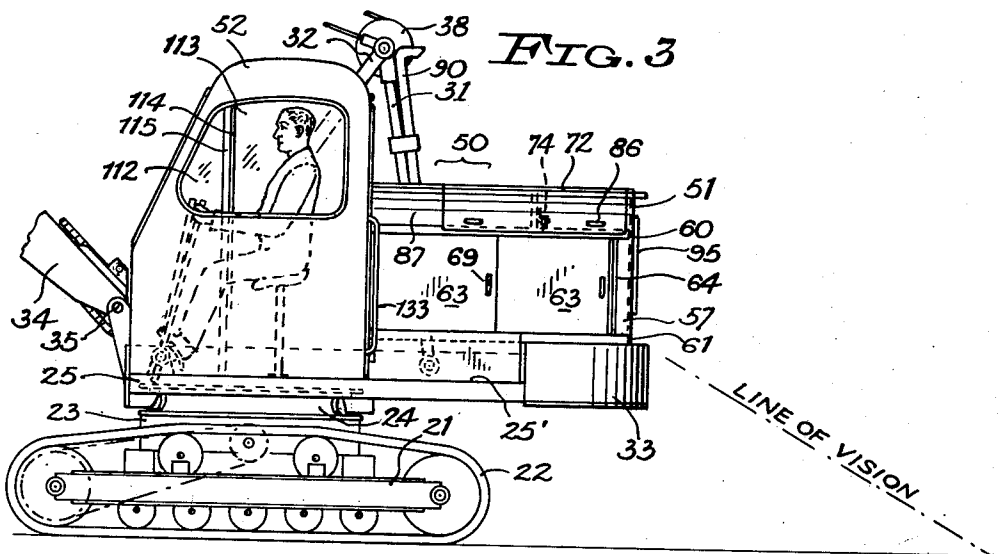
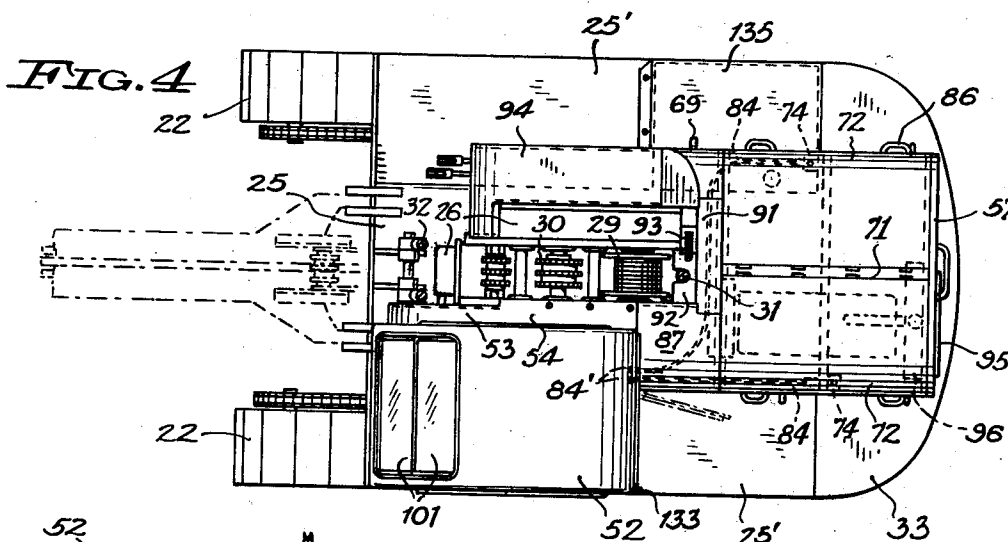
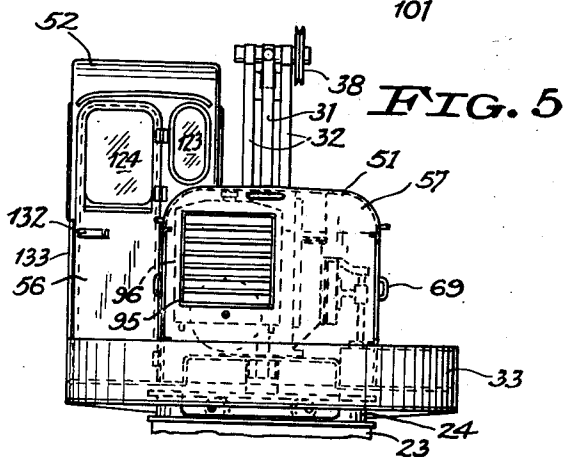
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4 Sheets-Sheet 2



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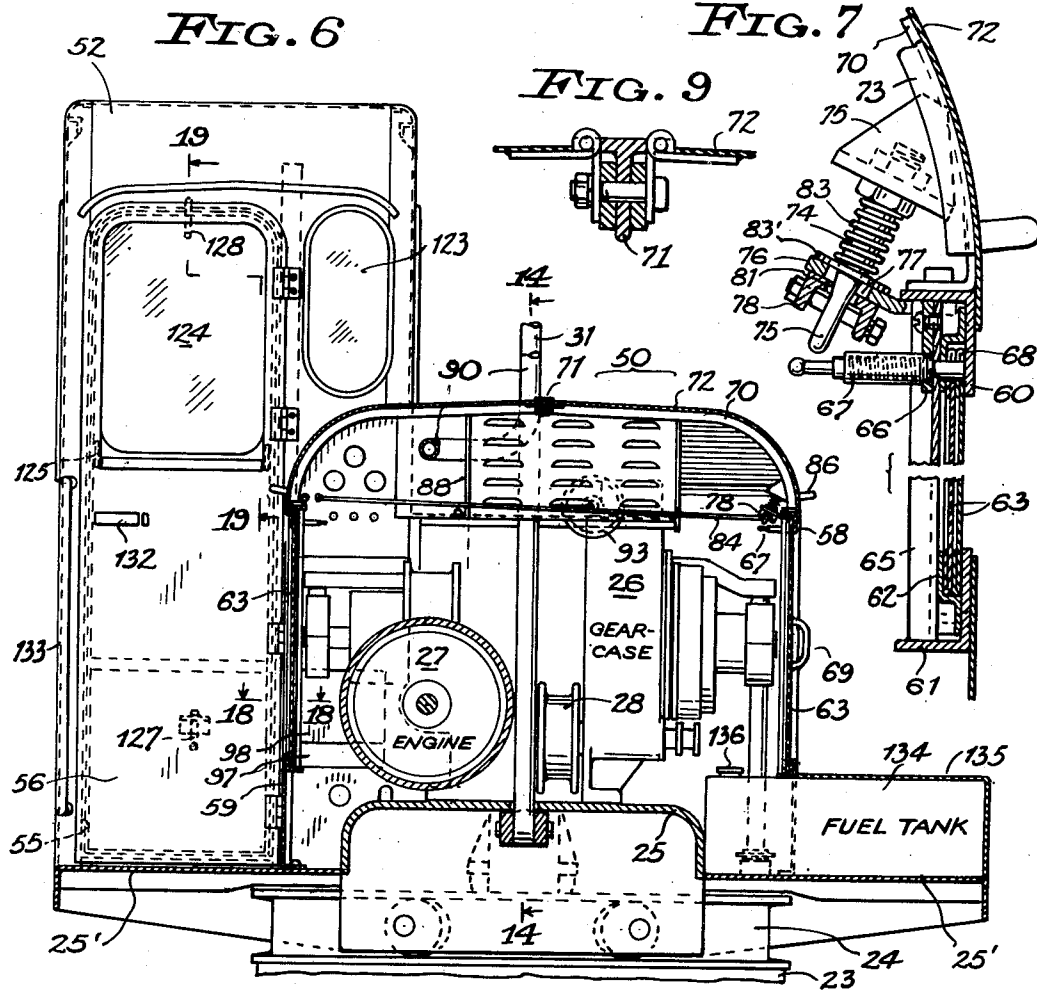
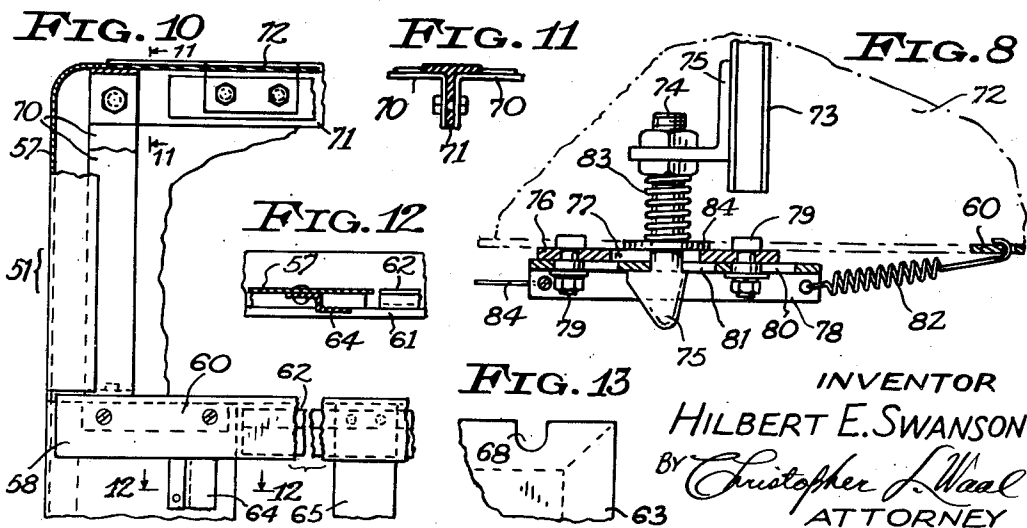
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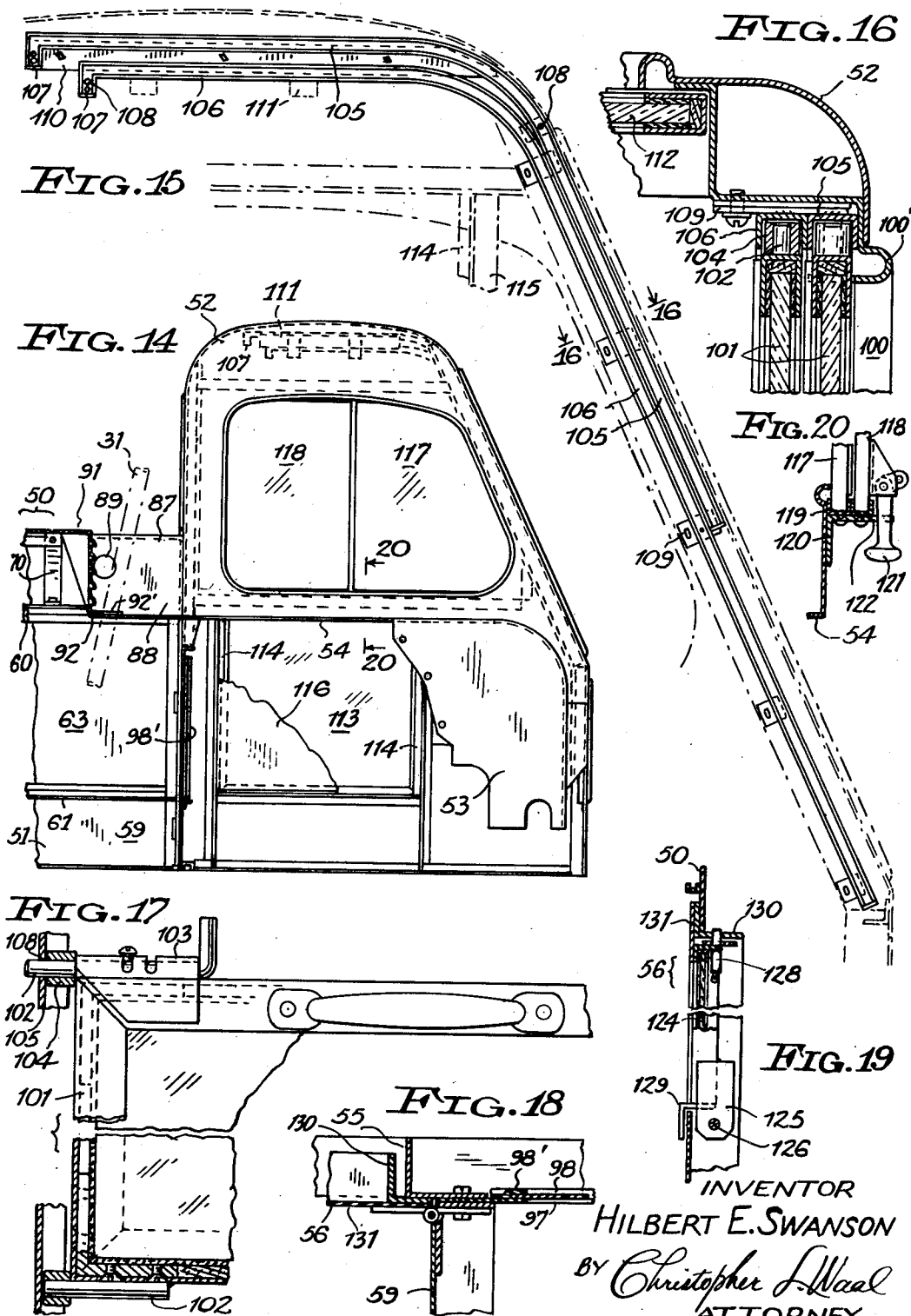
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MATERIAL HANDLING MACHINE

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4 Sheets-Sheet 4



UNITED STATES PATENT OFFICE

2,529,200

MATERIAL HANDLING MACHINE

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2 Claims. (Cl. 214—135)

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The present invention relates to material handling machines such as power shovels, cranes and the like, and particularly to cabs for such machines.

An object of the invention is to provide a power shovel machine or the like having an improved cab affording the operator an unobstructed view in all directions and protecting him against inclement weather.

Another object is to provide a machine of this type in which the operator's enclosure of the cab extends higher than the machinery enclosure and also projects laterally therefrom to improve the view to the rear, this relation further permitting the use of a rear entrance to the operator's enclosure.

Still another object is to provide a cab-type machine which will adequately protect the machinery while permitting convenient access thereto.

A further object is to perfect details of construction generally.

The invention further consists in the several features hereinafter described and claimed.

In the accompanying drawings,

Fig. 1 is a right-hand side elevation of a cab-type power shovel machine constructed in accordance with the invention;

Fig. 2 is a front elevation of the machine, the boom being removed;

Fig. 3 is a left-hand side elevation of the machine, parts of the boom being omitted;

Fig. 4 is a top view of the machine;

Fig. 5 is a rear elevation of the machine, parts of the undercarriage being omitted;

Fig. 6 is a transverse sectional elevation of the machine taken generally along the line 6—6 of Fig. 1;

Fig. 7 is a detail transverse sectional elevation of one side of the machinery enclosure showing movable closure members and locking means therefor;

Fig. 8 is a detail sectional view of a bonnet-locking device for the machinery enclosure;

Fig. 9 is a detail transverse sectional elevation of a bonnet hinge mounting;

Fig. 10 is an elevation, partly in section, of the rear portion of the machinery enclosure, as viewed from the right side;

Fig. 11 is a detail transverse sectional elevation taken generally along the line 11—11 of Fig. 10;

Fig. 12 is a detail sectional view taken generally along the line 12—12 of Fig. 10;

Fig. 13 is a detail view of an upper corner portion of a sliding panel for the machinery enclosure;

Fig. 14 is a longitudinal sectional elevation of the cab taken generally along the line 14—14 of Fig. 6, the machine being omitted;

Fig. 15 is a detail elevation of a window rail assembly for the sliding front windows of the cab;

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Fig. 16 is a detail sectional view of a front cover portion of the cab, taken generally along the line 16—16 of Fig. 15;

Fig. 17 is a detail inside view of one of the sliding front windows and an associated guide rail, parts being shown in section;

Fig. 18 is a detail sectional view taken generally along the line 18—18 of Fig. 6;

Fig. 19 is a detail sectional view taken generally along the line 19—19 of Fig. 6, and

Fig. 20 is a detail sectional view taken generally along the line 20—20 of Fig. 14.

In these drawings, and more particularly Figs. 1 to 6 thereof, the numeral 21 designates the undercarriage or chassis of a mobile material-handling machine, which by way of example is here shown to be a power shovel. The undercarriage comprises crawlers 22 at opposite sides supporting a frame or carbody 23, the latter carrying a superposed roller track 24 provided with the usual internal ring gear, not shown. In some instances, the undercarriage may be provided with rubber-tired wheels instead of crawlers, as is well understood in this art.

A rotating frame or turntable 25 is rotatably mounted on the roller track to turn about a vertical axis through an unlimited range and carries the usual mechanism for operating the machine, this mechanism including a gear-case 26 and an engine or motor 27. One suitable type of undercarriage and operating mechanism is shown in United States Patent 2,320,320, to Harold E. Brey and Hilbert E. Swanson, for Traction Brake and Driving Mechanism, issued May 25, 1943.

The gear-case 26 is here shown to carry the usual boom-hoisting drum 28, a dipper-hoisting drum 29, and a dipper-crowding sprocket wheel 30. The turntable carries the usual A-frame, here shown to comprise a rear leg 31 and a pair of laterally spaced front legs 32. The usual counterweight 33 is secured to the rear end of the turntable.

A boom 34 is detachably pivoted at 35 at the front of the turntable to swing in a vertical plane and is adjustably elevated by a hoisting cable 36 which is wound on the drum 28 and passes over sheaves 37 on the boom point and sheaves 38 on the A-frame, as usual. A reciprocating dipper stick or handle 39 slides in a guide member 40 pivoted on a shipper shaft 41 at the middle portion of the boom and carries an excavating dipper or bucket 42 at its lower end, the dipper having the customary hinged dump door 43.

Pivotal movement of the dipper stick 39 and the associated guide member 40 is effected by the usual dipper-hoisting cable 44 which passes over a sheave 45 on the dipper and sheaves 46 on the boom point and is wound onto the winding drum 29.

Longitudinal reciprocation of the dipper stick is effected in any suitable manner as by a crowd belt or chain 47 which is fastened at its ends to the opposite ends of the dipper stick and which passes

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over the reversibly driven sprocket wheel 30, guide sprockets 48 at the foot of the boom, and guide sprockets 49 coaxial with the shipper shaft. This general arrangement for the dipper crowd is disclosed in my United States Patent 2,304,486, for Crowd for Boom Structures, issued December 8, 1942.

In accordance with usual practice, the power shovel machine is readily converted to various other forms, such as a dragline, back-digger, clam-shell and crane, by providing a suitable boom and other equipment. The sprocket wheel 30 is removable to permit the substitution of a winding drum similar to the drum 29.

Mounted on the turntable 25 is a cab 50 which comprises a machinery enclosure 51 and an operator's enclosure 52. The machinery enclosure is somewhat narrower than the turntable and is set in from the opposite side edges thereof, so as to leave walkways at opposite sides, these walkways being formed by deck plates 25' constituting the side portions of the turntable, and also being formed by the opposite sides of the counterweight 33 which usually extends higher than the deck plates. The rear portion of the counterweight may project from the rear end of the machinery enclosure to facilitate travel of the operator from one side of the platform to the other.

The operator's enclosure is secured to the front portion of the platform and at one side thereof, here shown to be the left side, and extends higher than the machinery enclosure. The upper portion of the operator's enclosure has window openings on all sides, affording the operator an unobstructed view in all directions. The window openings are glazed, as hereinafter described, for protection against inclement weather. The operator's view directly to the rear is such that he may see the ground a short distance behind the machine, as indicated in Fig. 3. The vertical rear wall of the operator's enclosure is connected to the left front end of the machinery enclosure, and the lower right-hand side of the operator's enclosure is closed by the gear-case 26 and by a side panel 53 and flange 54 which are suitably fastened to the gear-case. The rear wall of the operator's enclosure has a doorway 55 opening onto the walkway of the rotating platform and closed by a door 56 which is hinged to the operator's enclosure near the side wall of the machinery enclosure. With the door in this location there is no danger of the door swinging beyond the side edge of the platform.

The machinery enclosure or hood 51 comprises a marginally-flanged vertical rear panel 57 which is secured to parallel side frames 58 and 59, the front end of the left-hand side frame being secured to the operator's enclosure, and the right-hand side frame extending laterally of the gear-case to a point near the front end of the gear-case. The side frames are generally similar and each includes horizontal upper and lower angle bars 60 and 61 which carry guide strips 62 at their inner sides to form therewith channel tracks, Fig. 7, slidably receiving the upper and lower edges of rectangular sheet metal closure panels 63, there being a pair of these panels at each side of the hood. The panels are similar except that those on the right-hand side are longer than those on the left-hand side. Endwise withdrawal of the panels is prevented by stop strips 64 which overlie the ends of the panels when the latter are in their closed position. Each pair of angle bars 60 and 61 is connected at their

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middle portions by a vertical channel bar 65 which carries a mounting plate 66 at its upper end for a spring bolt 67. The spring bolt is engageable in notches 68 formed in the upper edges of the overlapping slidable panels to lock the panels in their closed position. The panels are provided with handles 69 for effecting their opening and closing movements. When the panels are slid open, the machinery is accessible to a person standing on the adjacent walkway of the platform.

The upper bars 60 of the side frames 58 and 59 are connected by transversely extending arch bars 70 arranged in complementary pairs, one pair being disposed at and secured to the rear panel 57, and the other pair being spaced forwardly from the rear panel, each arch bar having in-turned ends. The upper ends of the arch bars are clamped to the ends of a longitudinally extending T-bar 71 arranged centrally of the hood. Curved bonnet panels 72 are hinged to the T-bar and close the upper portion of the hood, these bonnet panels being provided with transverse reinforcing channel bars 73.

Each bonnet panel is locked in closed position by a hook bolt 74 which is secured to a bracket 75 welded to the bonnet bar 73, the hook bolt having a cam nose 75, Figs. 7 and 8. A bracket 76 is secured to the upper bar 60 of the hood side frame and has an elongated opening 77 to pass the bolt. A channel bar 78 is slidably guided below the bracket 76 by bolts 79 extending in slots 80 in the bar and has an elongated opening 81 to admit the hooked end of the hook bolt, the channel bar being urged to locking position by a coiled spring 82 engaging one end of the bar. A coiled spring 83 surrounds the hook bolt and presses on a washer 83' engageable with the bracket 76, thus avoiding play and also releasing the bolt to unlocking position by the pressure of the spring 83 when the locking bar is moved to unlocking position. The latter movement is effected by a Bowden wire 84 or the like which is connected to the end of the locking bar opposite the spring 82 and extends through the rear wall of the operator's enclosure, where a suitable knob or button 84' is provided. After the bonnet panels are unlocked, the side panels can be unlocked by manipulating the spring bolts 67.

Each bonnet panel is provided with handles 86 for effecting its opening and closing movement. When the bonnet panel is to be locked, the bonnet is pressed downwardly against the action of the spring 83 in order to engage the hook bolt 74 with the locking bar 78.

Immediately behind the operator's enclosure the hood includes a casing section 87 with a downturned flange 88, the lower edge of which is fastened to the top wall of the gear case. The vertical flange 88 is provided with an opening 89, Fig. 14, to pass an engine exhaust pipe 90 which is secured to and extends along the rear leg 31 of the A-frame. The hood further includes a louvre member 91 which has a forwardly-projecting lower flange 92 adjacent to the rear top wall of the gear case, this flange having a notch 92' to admit the rear leg 31 of the A-frame and also being notched to pass the boom-hoisting cable 36, the latter being guided by a sheave 93. The top wall 94 of the right-hand front portion of the hood is offset downwardly, thus improving the operator's visibility toward the right side of the machine. The latter visibility is further improved by the fact that the hood or machinery enclosure is offset inwardly from the right-hand

edge of the rotating platform. The rear panel 57 of the machinery enclosure is provided with a radiator grille 95 behind which is mounted an engine radiator 96.

The rear panel of the operator's enclosure is provided with an opening 97 communicating with the interior of the machinery enclosure for admitting warm air to the operator's enclosure in cold weather. This opening is adjustably closed by a vertically-slidable panel 98 movable and frictionally confined in channel tracks 98', Figs. 6 and 18.

The front wall of the operator's enclosure has a lower vertical portion provided with a window sash 99, and has a sloping upper portion with a window opening 100 defined by a peripheral bead 100', the other window openings having similar beads. The window opening 100 is closed by a pair of slidable upper and lower window sashes 101 shown in detail in Figs. 16 and 17. Each window sash 101 is provided at its corner portions with horizontal pintles 102, at least one of the upper pintles being formed by the plunger of a barrel bolt 103. The pintles 102 of the upper sash member 101 carry respective rollers 104 which are movable in a channel track 105 at each side of the operator's enclosure, and the roller-bearing pintles of the lower sash are movable in similar but longer channel tracks 106 which extend adjacent to the tracks 105, as best seen in Fig. 15. When the sashes 101 are in their closed positions the lower edge of the upper sash overlies the upper edge of the lower sash, the lower ends of the roller tracks 105 and 106 being closed to determine their positions. The upper portions of the roller tracks extend in a generally horizontal position under the roof of the operator's enclosure, so that the two sashes may be moved upwardly to an open position in which they are housed under the hood, one below the other. The rear ends of the two channel tracks are provided with downturned pockets 107 to receive the rear roller-bearing pintles of the open windows, thus holding these windows against displacement. The webs of the roller tracks are further provided with locking openings 108 to admit the pintle-forming plungers of the barrel bolts 103 for locking the two sashes in their open and closed positions. The two channel tracks 105 and 106 at each side are secured together by suitable brackets 109 and 110 which are rigidly attached to the inner walls of the operator's enclosure, the bracket 110 being fastened to an angle bar 111 which is welded to the upper portion of the enclosure.

The left-hand side of the operator's enclosure is provided with a small fixed front window 112 and a relatively large vertically-slidable sash 113 which is movable in channel trackways 114, the front trackway being secured to a vertical angle bar 115. The sash 113 is similar to the sash 101 except for the omission of the pintles 102. The sliding sash 113 is detachably retained in its upper position in any suitable manner, and in its lower position is protected by a guard plate 116, Fig. 14. The right side of the operator's enclosure is provided with two sliding sashes 117 and 118, which are slidable in upper and lower horizontal trackways 119, the latter being shown in detail in Fig. 20 and being carried by an angle bar 120. In their closed positions the rear edge of the front sash 117 overlies the front edge of the rear sash 118. Each sash is provided at its inner side with a pivotally suspended locking handle 121, which

is engageable in any one of a series of notches 122 formed in the angle bar 120, one of these notches being shown in Fig. 20.

The rear wall of the operator's enclosure is provided at the right-hand side with a fixed window 123, and the door 56 is provided at its upper portion with a relatively large sash 124. The sash 124 carries side ears 125 at its lower portion, Fig. 19, secured to pivot members 126, permitting the sash to be swung inwardly to a suspended position in which it is locked by a spring bolt 127, Fig. 6. In its closed position the sash is locked to the door by a similar spring bolt 128, Figs. 6 and 19. Near its pivoted portion the window sash is provided with a horizontal angle 129 which overhangs the lower edge of the window-opening in the door, so as to exclude the weather. The door frame is formed by an angle bar 130 of inverted U-shape to which a sheet metal panel 131 is secured. The door is provided with a suitable operating handle 132. Near the left-hand edge of the door opening a vertical handrail 133 is secured to the operator's enclosure.

A fuel tank 134 is mounted on the right-hand deck plate of the rotating platform near the counterweight and is protected by a cover 135. The fuel tank projects into the machinery compartment and is provided with a filling opening 136 within this compartment, thus preventing access to the fuel tank by unauthorized persons.

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

1. In a material handling machine having a rotating machinery platform, a cab on said platform having a machinery enclosure and an operator's enclosure with windows on all sides, said operator's enclosure extending higher than said machinery enclosure and projecting laterally from one side of said machinery enclosure, and said operator's enclosure having a rear entrance adjacent to a side wall of the machinery enclosure.

2. In a material handling machine having a rotating machinery platform, a cab on said platform having a machinery enclosure and an operator's enclosure with windows on all sides, said operator's enclosure extending higher than said machinery enclosure and projecting laterally from a side wall of said machinery enclosure, said machinery enclosure having a side wall spaced inwardly from a side edge of the platform to provide a walkway extending rearwardly from said operator's enclosure, and said operator's enclosure having a rear entrance opening onto said walkway.

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