Aug. 6, 1957 C. W. BRAUER 2,801,479

EXCAVATING AND LOADING DEVICE.

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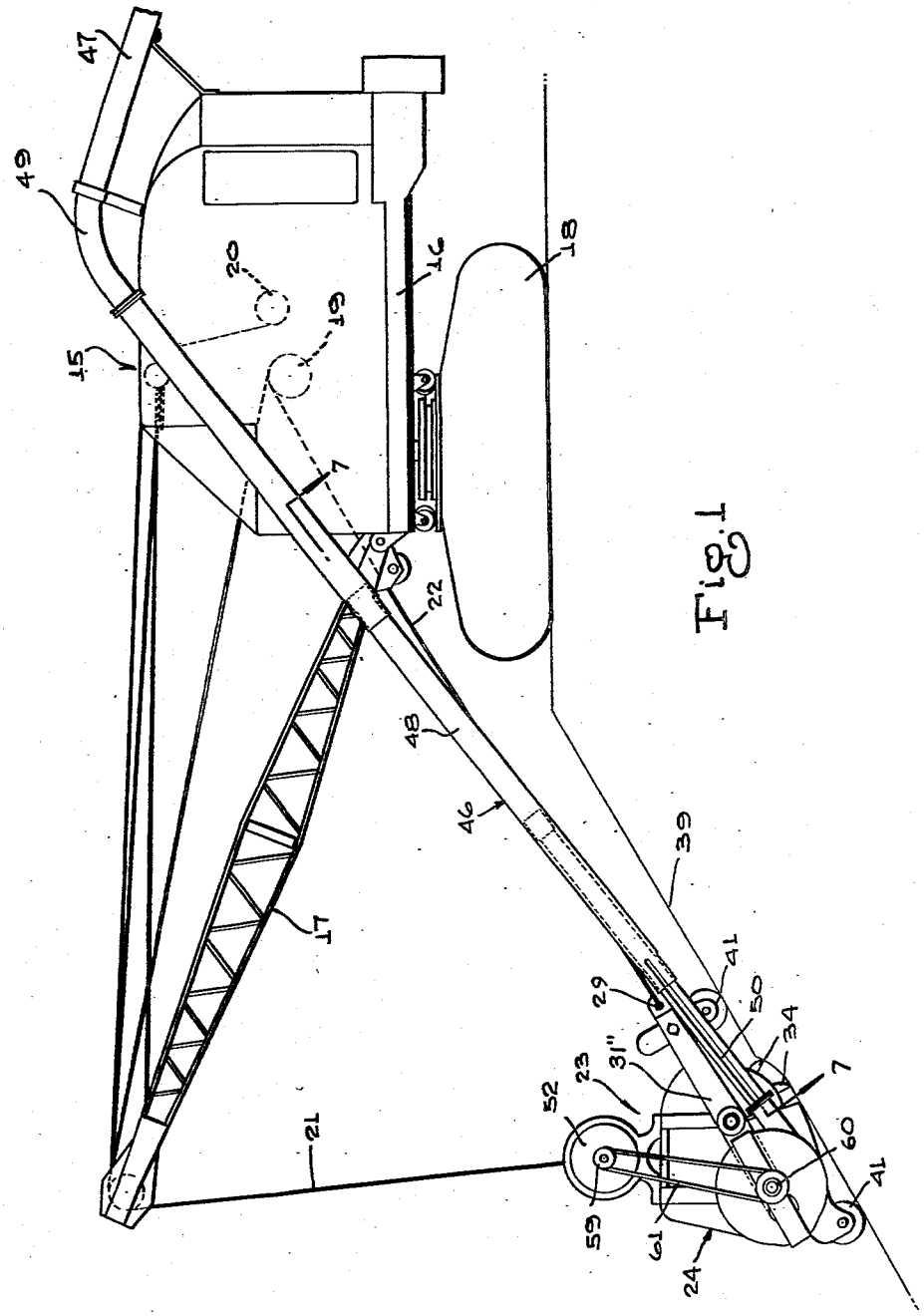


Fig. 1

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Fig. 2

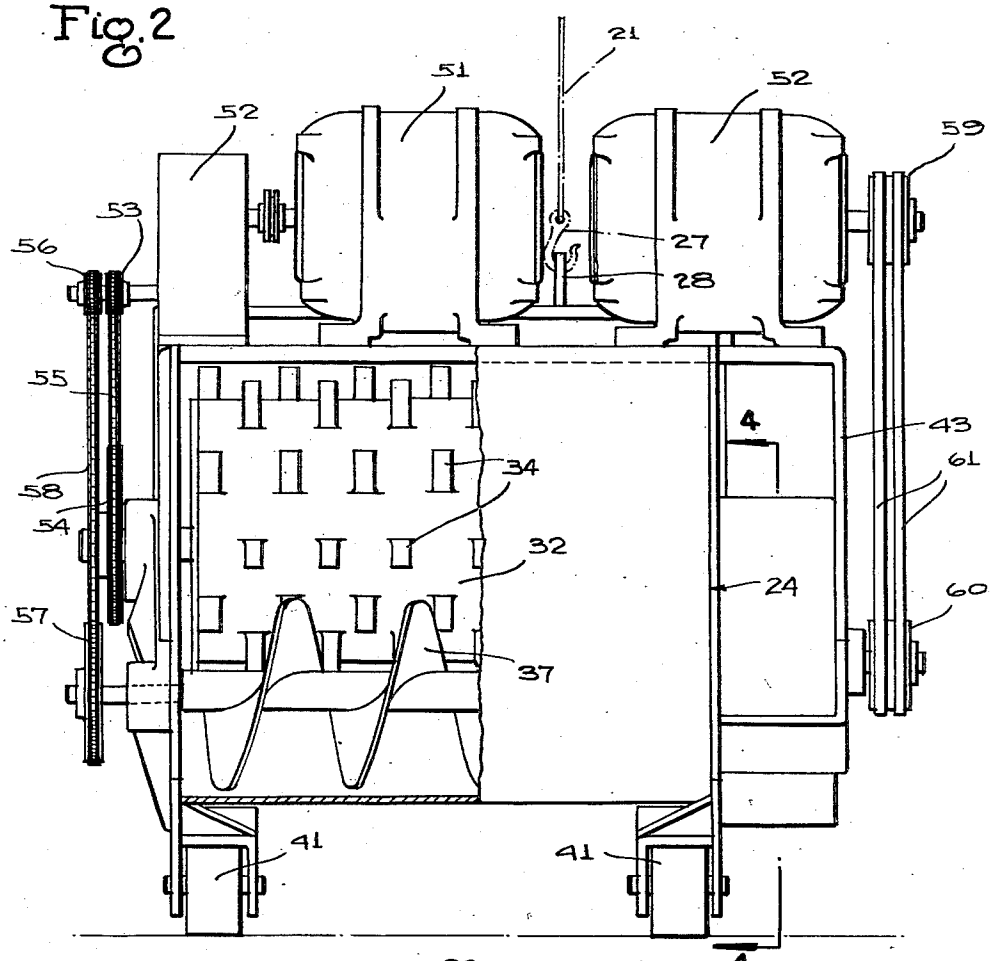
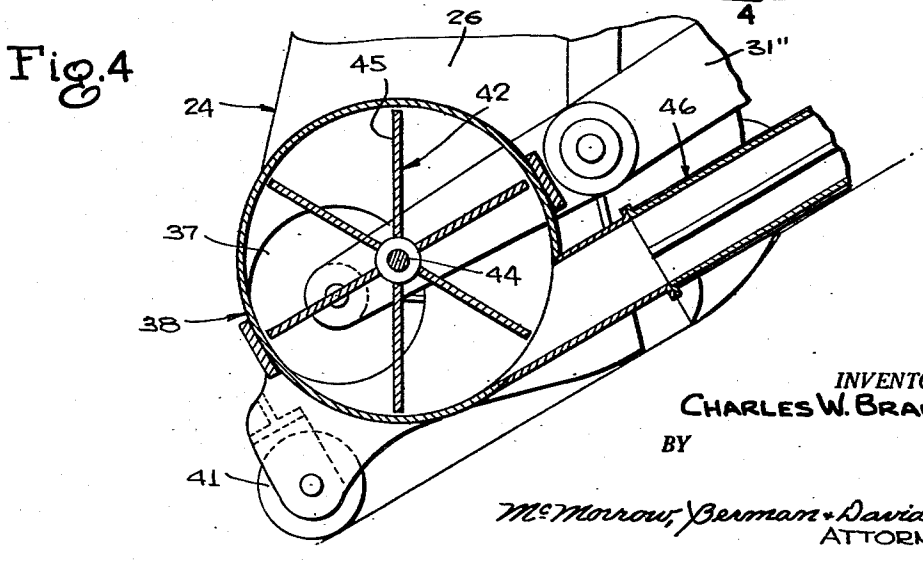


Fig. 4



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EXCAVATING AND LOADING DEVICE

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Fig. 3

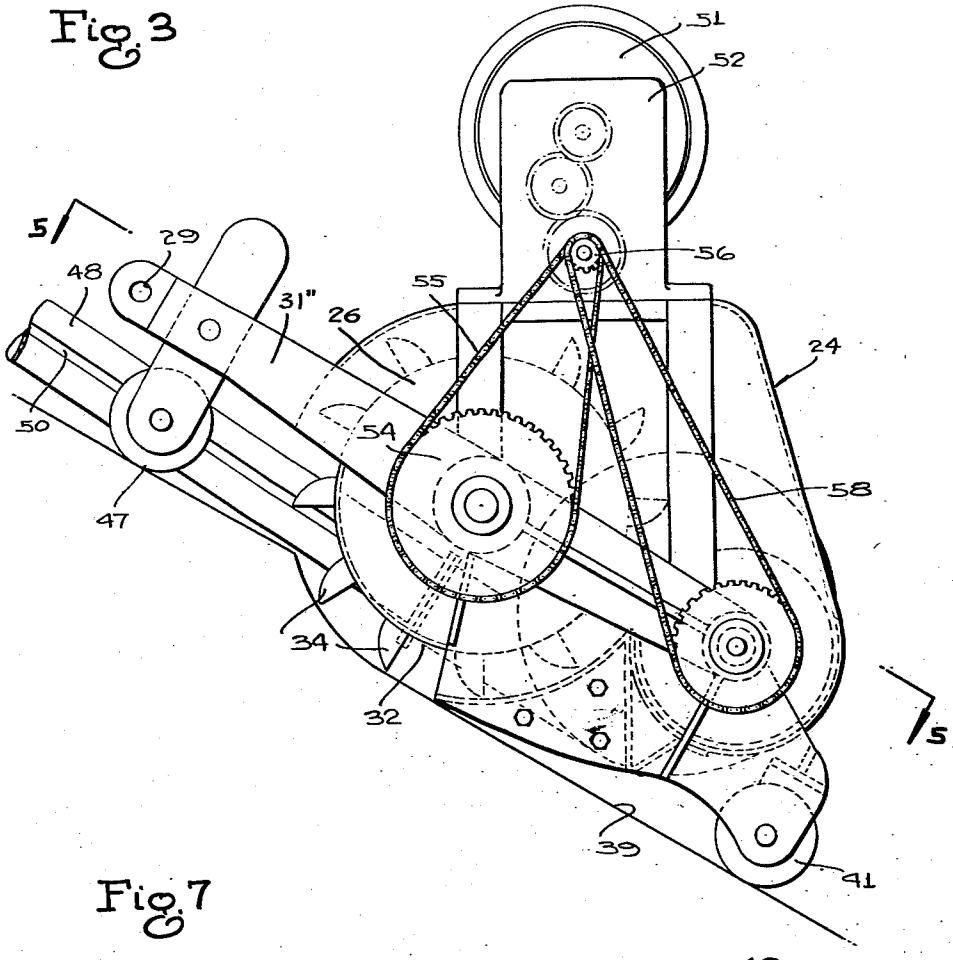
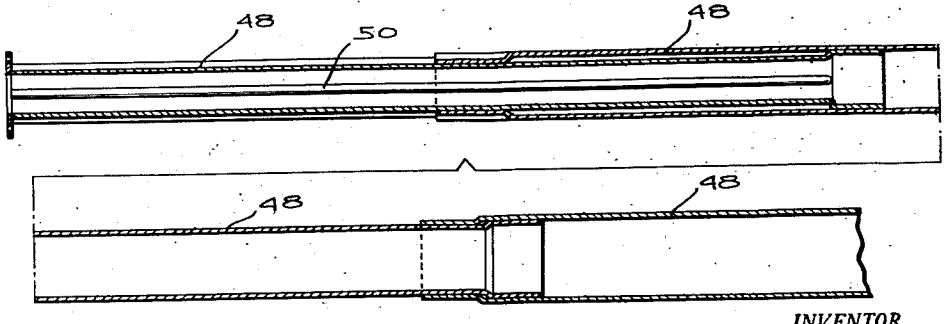


Fig. 7



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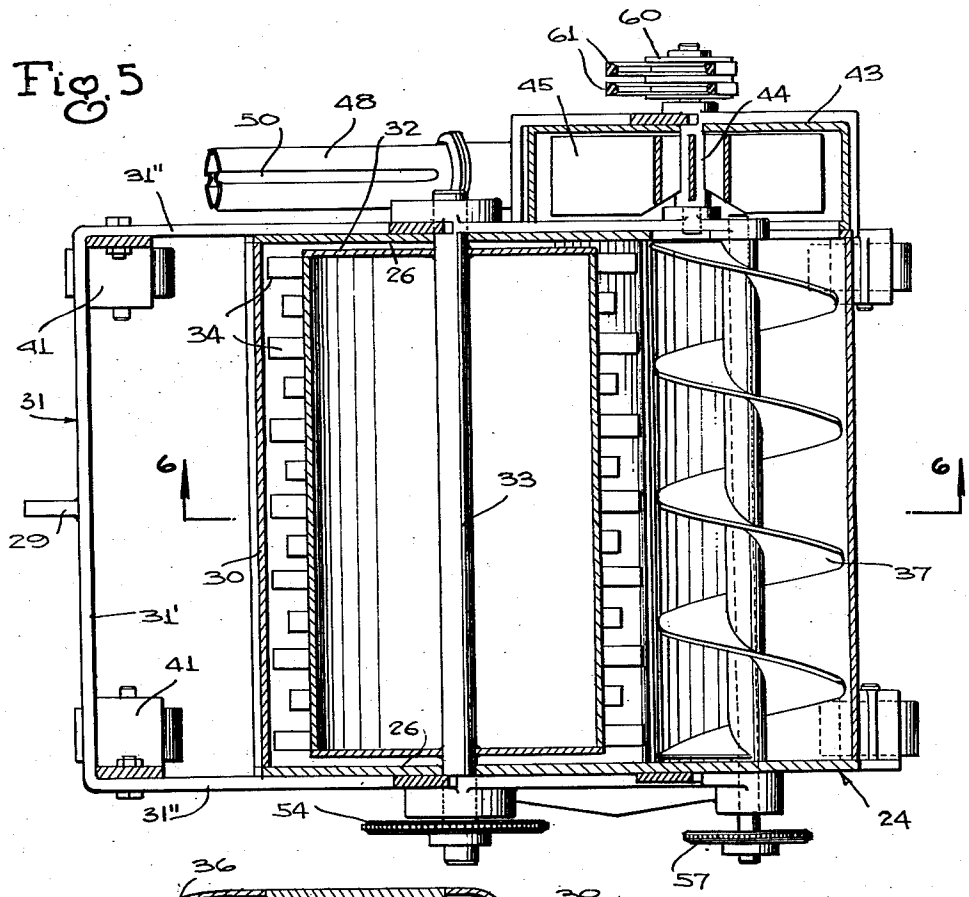
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EXCAVATING AND LOADING DEVICE

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Fig. 5



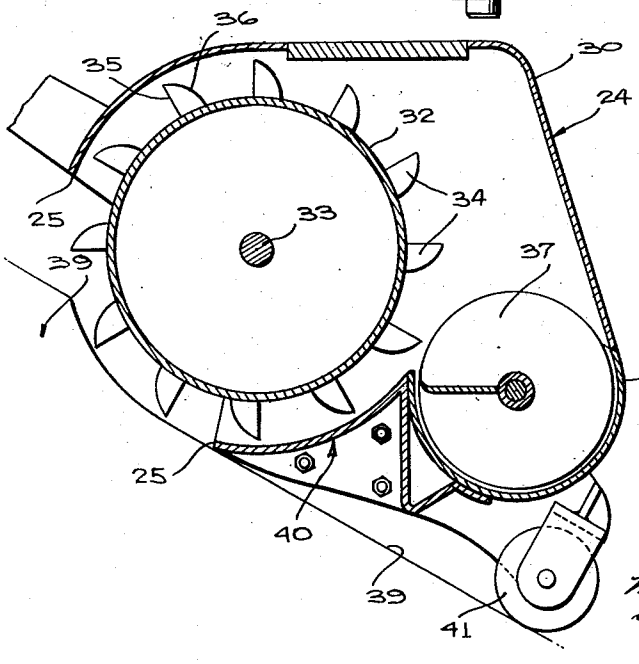


Fig. 6

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2,801,479

EXCAVATING AND LOADING DEVICE

Charles W. Brauer, Peoria, Ill.

Application September 3, 1954, Serial No. 453,991

3 Claims. (Cl. 37—189)

This invention relates to excavating and loading devices.

An object of the invention is to provide an improved excavating and loading device which is designed especially but not exclusively to be operated by and mounted upon a mobile vehicle, and to depend from the vehicle to operate upon ground surfaces which decline from the surface upon which the vehicle is supported.

Another object of the invention is to provide an excavating and loading device of the above indicated character which may quickly and easily be moved upwardly or downwardly along a declining ground surface or shifted between spaced points thereon.

A further object of the invention is to provide an excavating and loading device of the character indicated above in which the material excavated is immediately conveyed to one side of the digger element and then raised to a loading outlet while remaining to said one side of the digger element.

Other objects and advantages of the invention will appear from the following description considered in conjunction with the attached drawings in which:

Figure 1 is a side elevational view of a device of the present invention mounted upon a mobile carrier;

Figure 2 is a rear elevational view, on an enlarged scale and partially in section, of said device;

Figure 3 is a side elevational view taken from the side opposite that shown in Figure 1, and on an enlarged scale;

Figure 4 is a vertical section taken along the line 4—4 of Figure 2;

Figure 5 is a horizontal section taken along the line 5—5 of Figure 3;

Figure 6 is a vertical section taken along the line 6—6 of Figure 5; and

Figure 7 is a horizontal section taken along the line 7—7 of Figure 1, on an enlarged scale, divided in two parts for purposes of arrangement on the sheet.

Referring now to the drawings in more detail, the reference numeral 15 designates generally a mobile carrier including a frame 16 and a boom 17, the boom having its lower end connected to the frame 16 for swinging movement about a horizontal axis. The carrier 15 also includes conventional ground engaging gear, diagrammatically shown at 18, upon which the frame 16 is rotatably mounted, and cable drums 19 and 20 mounted upon the frame 16. A first cable 21 is pulley-supported on the upper end of the boom 17 and has one end connected to the drum 19. A second cable 22 also has one end connected to the drum 19. Operatively connected to the other ends of the cables 21 and 22 is an excavating and loading device, generally designated 23, which embodies the present invention.

The device 23 includes an upstanding housing 24. The other end of the cable 21 is attached to the top of the housing 24 by means of a hook 27 which is engaged in an eye 28 projecting from the top of the housing 24. The other end of the cable 22 is attached to an eye 29 carried

by the bight portion 31' of a U-shaped frame 31 having the legs 31'' supported by the side walls 26 of the housing 24. A pair of spaced wheels 41 are secured to a forward part of the underside of the housing 24, adjacent each end thereof, the wheels 41 serving to control the depth of a cutting drum 32 rotatably journalled in the side or end walls of the housing 24, with the cables 21 and 22 controlling the mobility backwardly and forwardly on a ground surface.

The cutting drum 32 is positioned transversely of and within the housing 24 and projects rearwardly through an opening 25, the drum 32 being mounted upon a shaft 33 journalled in the side or end walls of the housing 24. The opening 25 is formed partly in the rear wall 26 and in the bottom of the housing 24. Arranged about and projecting from the periphery of the drum 32, is a plurality of digging teeth 34, the teeth 34 operating through the opening 25 in the housing 24. The teeth 34 are arranged in staggered longitudinal rows along the drum surface, as shown in Figure 2, and have flat radial surfaces 35 facing in the direction of rotation of the drum and an arcuate surface 36 facing in the opposite direction.

Positioned transversely of and within the housing 24 on a level below the axis of the drum 32, is a rotatable screw conveyor 37, the conveyor 37 being adjacent the front wall 38 of the housing 24 in a position to receive material dug from a ground surface, generally designated 39, by the teeth 34 when the drum 32 is rotated. A portion of the bottom of the housing 24 is so shaped as to cooperate with the teeth 34 in guiding material dug by the teeth 34 to the conveyor 37, is indicated at 40.

On the outside of one side of the housing 24, is a rotary blower 42 which is in communication with one end of the conveyor 37 through an opening provided in said one side. The blower 42 includes a rotary shaft 44 journalled in the blower casing 43 and a plurality of blades 45 extending radially from the shaft 44.

Connected to the blower 42 is the lower end of a conduit 46 for discharging the excavated material received in the blower 42 from the screw conveyor 37. The conduit 46 has its free end 47 raised above the ground level adjacent the carrier 15 for discharging the material passing through the conduit 46 into a waiting vehicle or hopper. The conduit 46 consists of a plurality of telescoping sections 48 a non-telescoping discharge section 49 which is secured in the raised position above referred to, the sections 48 being formed with interlocking longitudinally extending grooves 50, as shown in Figure 7, where necessary, to prevent the rotation of one section 48 upon another.

Means are operatively connected to the drum 32, the conveyor 37, and the blower 42 for causing rotation thereof said means comprising electric motors 51 and 52 which are mounted upon the top of the housing 24 and connected to the elements 32, 37 and 42 by appropriate driving means. The motor 51 is connected directly to gearing 52 which drives the drum 32 through sprockets 53 and 54 and a chain 55. Similarly, the motor 51 drives the conveyor 37 through sprockets 56 and 57 and a chain 58. The motor 52 drives the blower 42 through pulleys 59 and 60 and belts 61.

As will be apparent from the foregoing description, the mobile carrier 15 may be moved to the edge of a declining ground surface 39 and the excavating and loading device of the present invention then positioned at any point upon the inclined surface 39 by proper manipulation of the boom 17 and the cables 21 and 22. When positioned at a chosen spot upon the declining surface 39, the device 23 will rest upon its wheels 41 and, in that position, the teeth 34 of the drum 32, extending outwardly through the opening 25, will dig into the surface 39, underlying the opening 25, and will throw the ma-

terial excavated into the screw conveyor **37** which conveys the material into the blower casing **43** to be acted upon by the blower **42**. By the effect of the blower **42**, the material will be forced up the conduit **46** and discharged from the outlet **47** into a waiting truck or other vehicle. To excavate at a different level, the device **23** may be moved upwardly or downwardly along the surface **39** by the operation of the cable drum **19** to reel or unreel the cables **21** and **22**, the telescoping sections **48** of the conduit **46** adjusting themselves to the altered position of the device **23**. Moreover, by the elevation of the boom **17** and the rotation of the frame **16** upon the ground engaging gear **18**, the device **23** may be shifted from one position on the ground surface **39** to another position spaced therefrom without the difficulty and inconvenience of moving the device **23** along the intervening ground surface. By virtue of the conveyor **37** and the arrangement of the conduit **46**, the material excavated is moved immediately out of the line of operation of the drum **32** and is conveyed to the discharge point **47** without again being brought into the line of operation of the drum **32**.

What is claimed is:

1. In an excavating and loading device, a housing having top, bottom and end walls, and front and rear walls, said rear and bottom walls together having an opening therein extending across the housing, a cutting drum within the housing and journaled on said end walls and projecting rearwardly through said opening, a screw conveyor mounted within the housing adjacent to said front wall and said bottom wall, one end wall having an opening registered with one end of the screw conveyor, an exterior blower casing mounted on said one end wall in communication with the last mentioned opening, a blower mounted within said blower casing, a discharge conduit leading from the blower casing, and drive means on the housing operatively connected to the cutting drum, the screw conveyor and the blower.

2. In an excavating and loading device, a housing having top, bottom and end walls, and front and rear walls, said rear and bottom walls together having an opening therein extending across the housing, a cutting drum within the housing and journaled on said end walls and projecting rearwardly through said opening, a screw conveyor mounted within the housing adjacent to said front wall and said bottom wall, one end wall having an opening registered with one end of the screw conveyor, an exterior blower casing mounted on said one end wall in communication with the last mentioned opening, a blower mounted within said blower casing, a discharge conduit leading from the blower casing, and drive means on the housing operatively connected to the cutting drum, the screw conveyor and the blower, and ground engaging wheel means secured to the housing and projecting below the housing adjacent to said front wall.

3. In an excavating and loading device, a housing having a top, bottom and end walls, and front and rear walls, said rear and bottom walls together having an opening therein extending across the housing, a cutting drum within the housing and journaled on said end walls and projecting rearwardly through said opening, a screw conveyor mounted within the housing adjacent to said front wall and said bottom wall, one end wall having an opening registered with one end of the screw conveyor, an exterior blower casing mounted on said one end wall in communication with the last mentioned opening, a blower mounted within said blower casing, a discharge conduit leading from the blower casing, and drive means on the housing operatively connected to the cutting drum, the screw conveyor and the blower, and ground engaging wheel means secured to the housing and projecting below the housing adjacent to said front wall, a frame projecting rearwardly from and secured to said housing, and other ground engaging wheel means mounted on and depending from said frame.

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