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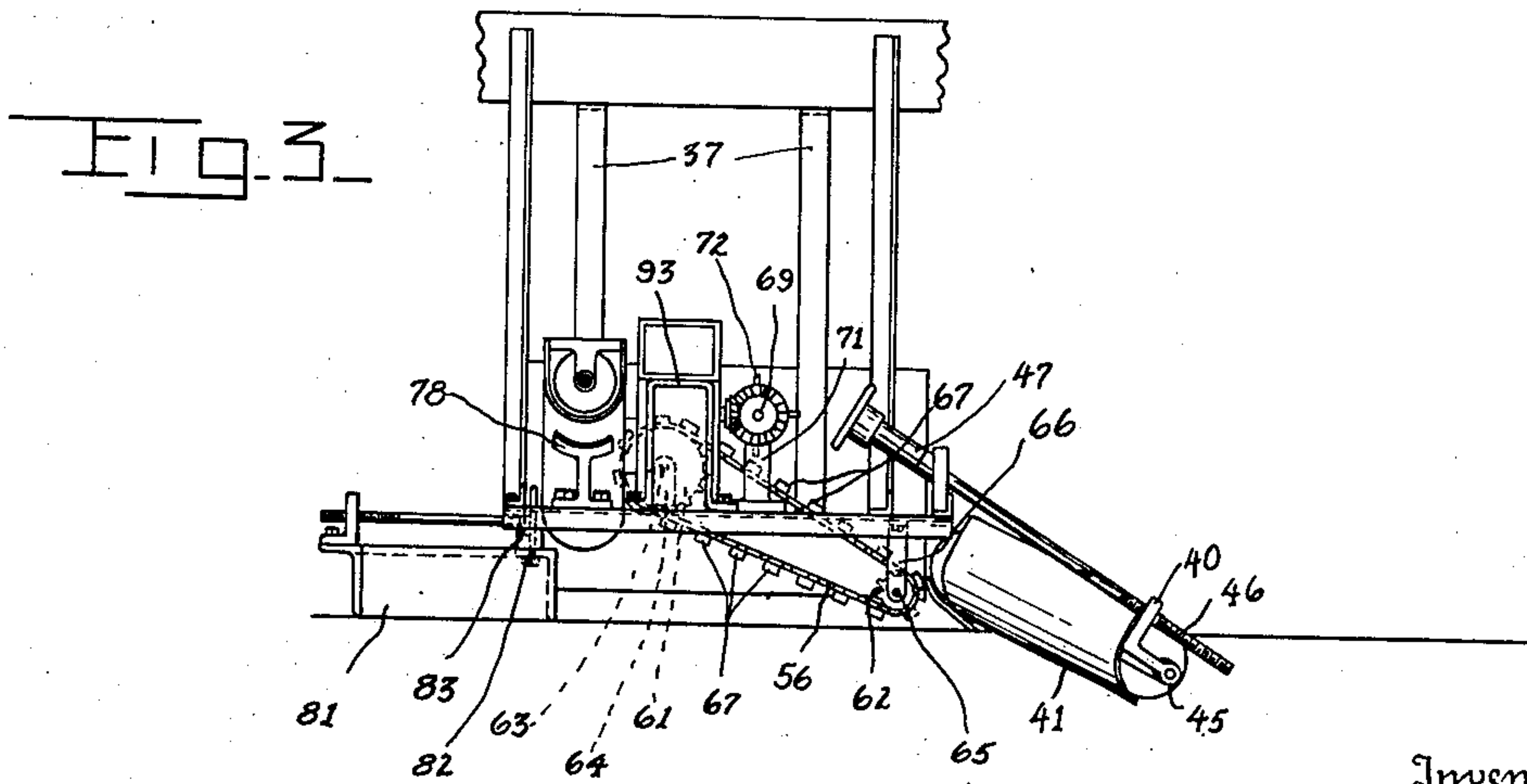
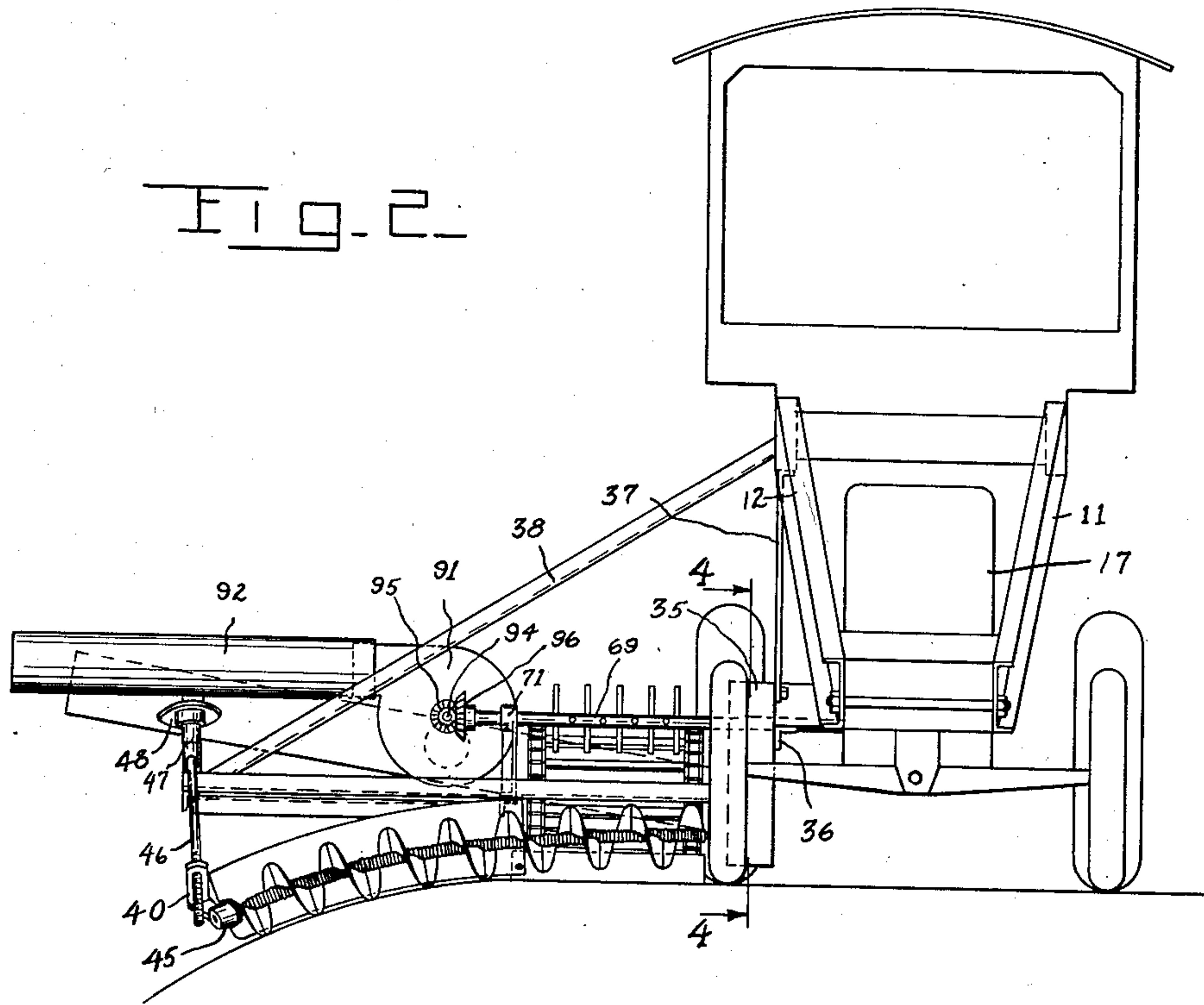
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ROAD WORKING MACHINE

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ROAD WORKING MACHINE

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17 Claims. (Cl. 262—2)

My invention relates to road working machines and has for an object to provide a machine capable of working the shoulder of the road.

5 An object of the invention resides in providing a machine which will work the road outwardly of the supporting wheels of the machine.

Another object of the invention resides in providing a machine in which material is picked up from the road and discharged outwardly beyond 10 the shoulder of the road.

A still further object of the invention resides in providing a machine in which earth, weeds, etc., are picked up and in which the earth is separated from the weeds and deposited back upon 15 the road and in which the weeds are discharged outwardly beyond the road.

An object of the invention resides in providing a blower for removing snow and other fine materials from the weeds separated from the earth.

20 Another object of the invention resides in providing a leveling device for leveling off the earth deposited back upon the shoulder of the road.

A feature of the invention resides in constructing the device for removing the weeds, earth, etc., flexible so that the same may be arranged to fit 25 the contour of the shoulder of a road.

Another object of the invention resides in constructing the device for removing the weeds, earth, etc., in the form of a conveyor having a flexible shaft with separate flights attached 30 thereto.

An object of the invention resides in providing in conjunction with the means for separating the earth from the weeds, a device for breaking up 35 the earth into small pieces.

A feature of the invention resides in the arrangement of the various conveyors and other parts of the invention whereby the material removed is first carried inwardly, then the component parts thereof separated and the weeds and certain of the materials separated are carried outwardly beyond the shoulder of the road. 40

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described. 45

In the drawings:

Fig. 1 is a plan view of a road working machine illustrating an embodiment of my invention.

50 Fig. 2 is a front elevational view of the structure shown in Fig. 1.

Fig. 3 is a fragmentary side elevational view of the structure shown in Fig. 1.

Fig. 4 is an elevational sectional detail view of 55 the gear case taken on line 4—4 of Fig. 2.

In the working of roads it has heretofore been found impractical to remove weeds and finish up the shoulder of a road by means of a machine traveling upon the road. The present invention provides a machine which may travel on the pavement where the road is paved or upon the inner 5 portion of the road and which while so traveling will work the shoulder.

My invention utilizes a wheel supported frame and may be attached to a road grader frame, a truck frame or any other wheel supported frame. Since such frames are well known in the art, the same has not been described in detail in this application and the invention as shown is applied to a road grader which is indicated in its entirety 10 by the reference character A. The road grader A comprises a frame 10 which consists of two arched longitudinal frame members 11 and 12 connected together at their ends by means of transverse frame members 13 and 14. The rearward portion of the frame 10 is supported on driving wheels 15 and 16 which may be driven from a power plant 17 in the usual manner, said power plant being mounted at the rearward portion of 20 the machine. The forward portion of the road grader frame is supported by steering wheels 18 and 19 which are connected to the frame member 13 in a manner to permit of steering the road grader. At the center of the frame 10 is provided the usual circle 21 which carries a blade 22. At the rear of the tractor is provided a cab 23 in which the operator is stationed and from which the entire road grader may be controlled. The method of controlling the same and the apparatus therefor forming no feature of the invention have 25 not been illustrated in this application. 30

My invention proper is indicated in its entirety by the reference character B and comprises a frame 30 which consists of two transverse frame members 32 and 33 connected to two longitudinally extending frame members 31 and 34 at the outermost end thereof. The frame members 32 and 33 are attached to a gear case 35 in which the transmission for driving the various parts of the invention are disposed. The case 35 has secured to it a longitudinally extending frame member 36 which is secured to the frame member 12 of grader A at the ends thereof. In addition two hangers 37 are utilized which are attached to the case 35 and which are further secured to the frame member 12 in the central portion of the same 40 where said frame member is the highest. Two braces 38 are connected to the longitudinally extending frame member 34 and to the frame member 12 at the high point thereof and serve to support 45 50 55

port the frame 30 in a rigid manner so that said frame projects laterally outwardly from the frame 10 of the road grader proper.

My invention comprises a device for removing the weeds and earth from the shoulder of the road which I have indicated in its entirety by the reference numeral 41. This device is in the nature of a conveyor and consists of a screw 42 operating in conjunction with the mold board 43. The screw 42 is constructed with a flexible shaft 44 constructed of a coil spring which is journaled in one end in a bearing 45 and at its other end is attached to a shaft 50 which is journaled in a bearing formed in the case 35. The bearing 45 has swivelly connected to it a bracket 40 which is threaded to receive a threaded adjusting rod 46. Rod 46 is rotatably mounted in a bearing 47 swivelly attached to the frame member 33 and held from longitudinal movement therein. This rod has a hand wheel 48 secured at one end of the same, whereby said rod may be rotated and the bearing 45 moved toward and from the frame 30. For the purpose of simplicity, the rod 46 has been shown as manipulated by a hand wheel situated at the end of the same. However, it can readily be comprehended that by suitable shafting and bevel gears and other transmission, this rod may be controlled from means disposed within the cab 23 of the tractor. The screw 42 further includes a number of flights 49 which are attached to the convolutions of the shaft 44 and which in conjunction form a screw capable of progressing the material removed by the same inwardly toward the center of the road. The mold board 43 is constructed in two sections 51 and 52 which are pivoted together at 53. The bearing 45 is attached to the section 52 and when the rod 46 is rotated this section is moved upwardly and rearwardly about the pivot 53. The device 41 is curved so that the same fits the contour of the shoulder of the road as shown in Fig. 2 and the mold board 43 is correspondingly curved. The section 51 of mold board 43 is constructed with a leading edge 54 which is adapted to cut the weeds and level off the irregularities of the earth of the shoulder. Due to the fact that the screw 42 is somewhat elevated at its inner end the section 51 of the mold board projects forwardly of the section 52. Section 52 may also be constructed with a sharpened leading edge 55 which is adapted to cut weeds and level off the earth with which it comes in contact.

Although I have shown the screw 41 as flexible, it can readily be comprehended that two straight sections may be employed which may be connected together by means of universal joints and operated in the same manner as the structure illustrated or where it is not desired to follow the contour of the road, a single straight screw may be utilized.

Operating in conjunction with the device 41 is a slat conveyor 56 which operates to separate the weeds from the earth. This slat conveyor consists of two chains 57 and 58 which are mounted upon sprockets 61 and 62. The sprocket 61 is attached to a shaft 63 which is journaled in a bearing formed in case 35 and in another bearing 64 attached to the longitudinal frame member 31. The sprocket 62 is mounted on a shaft 65 which is similarly journaled in case 35 and in a bearing 66 attached to the frame member 31. The chains 57 and 58 have attached to them slats 67 which are spaced apart a suitable distance to carry weeds and similar material along the upper run thereof and to permit loose earth

and smaller particles of material to pass through the same and to be deposited upon the road immediately below said conveyor. The slat conveyor 56 inclines upwardly as shown in Fig. 3 and is driven in such a manner that the same picks up the material delivered by the screw 42 and discharges the material carried by the same at its upper end.

Operating in conjunction with the slat conveyor 56 is a breaking device 68 which serves to break up the chunks of earth carried up by the conveyor 56. This device consists of a shaft 69 which is journaled in a bearing formed in case 35 and in another bearing 71 attached to the frame member 31. This shaft has a number of prongs 72 secured to the same which project outwardly therefrom and which are disposed so that the ends thereof come in close proximity to the slats 67 of conveyor 56. These prongs operate in conjunction with the slats 67 to break the large chunks of earth which may be carried upwardly by the conveyor 56 and also serve to positively convey the weeds and similar material upwardly over the upper end of said conveyor.

The conveyor 56 discharges into a screw conveyor 73. This conveyor consists of a screw 74 having a shaft 75 journaled in a bearing 76 secured to a trough 77 in which the said screw operates. The other end of this shaft is journaled in a bearing formed in the case 35. The trough 77 rests at its outer end on a saddle 78 secured to the longitudinal frame member 34 and is secured at its other end to the case 35. The upper end of the conveyor 56 is sufficiently high so that the same discharges into the trough 77.

It will be seen that the smaller particles of earth broken up by the breaking device 68 pass through the conveyor 56 and drop back upon the shoulder of the road. For leveling off this earth a scraper blade 81 is employed which is pivoted at 82 to a hanger 83 attached to the case 35. The other end of this scraper has connected to it a threaded rod 84 which is rotatably mounted in a bearing 55 swivelly attached to the underside of the transverse frame member 32. This rod is threaded in a lug 86 swivelly secured to said scraper. A hand wheel 87 on the end of rod 84 serves to rotate the same, whereby the blade 81 may be moved forwardly or rearwardly to vary the inclination of the same. The rod 84 may, if desired, be operated by remote control from the cab 23 the same as the rod 46, the same being accomplished through suitable shafting and gearing connected therewith.

In conjunction with the conveyor 73 a blower 91 is employed. This blower is supported by the longitudinal frame member 31 and is provided with a discharge spout 92 extending outwardly therefrom. An upright 93 secured to the longitudinal frame member 34 supports the spout 92 at its outer end. The blower 91 is constructed with a blower shaft 94 which has attached to it a bevel gear 95. This bevel gear meshes with another bevel gear 96 fast on shaft 69. By means of this construction the blower is driven in a manner to cause the earth and materials carried thereby to be discharged through the spout 92. The intake of the blower is indicated at 97 and is connected to the trough 77 intermediate the ends of the same and in proximity to the slat conveyor 56. The blower 91 serves to remove snow and other light materials collected with the weeds and to discharge the same outwardly beyond the shoulder of the road and upon the adjoining portion of the right of way.

The various parts of the invention are driven in the following manner: Attached to the power plant 17 of the grader A is a transmission 105. Shaft 69 extends completely through the case 35 and is driven by the transmission 105. Attached to this shaft within the case 35 is a gear pinion 106 which meshes with a gear 107. Gear 107 is rotatably mounted on a stub shaft 108 secured to case 35. A sprocket 109 is secured to gear 107. A chain 112 passes over this sprocket and another sprocket 113 which is fast on the shaft. By means of this construction the device 41 is operated. A pinion 111 is also attached to gear 107. This pinion meshes with a gear 114 rotatable on a stub shaft 115 secured to case 35. This gear in turn meshes with another gear 116 which is keyed to the end of shaft 63, whereby the slat conveyor 56 is driven. Conveyor 73 is driven by means of a gear 117 attached to shaft 74 which meshes with the gear 116.

The operation of the invention is as follows: The flights 49 of conveyor 41 engage the weeds and earth and cut off the weeds and loosen the irregularities of the shoulder. The mold boards 52 and 51 scrape along the surface of the shoulder and further assist in cutting off the weeds and loosening irregular particles of earth as well as smoothing the surface of the shoulder. As the grader travels in a forward direction the weeds and earth so loosened are advanced by the screw 42 which carries the same upwardly to a position where the material so loosened may be engaged by the slat conveyor 56. This conveyor elevates the material removed from the shoulder of the road and brings the same into a position where the breaking device 68 may engage the same. This breaks up the earth into smaller particles which pass through the slat conveyor 56 and are deposited back upon the ground. The weeds and other similar material are carried through the breaking device and are discharged from the upper end of the conveyor 56 to the conveyor 73. This conveyor carries the material deposited therein outwardly beyond the shoulder of the road and deposits the same in the ditch or gutter to the side of the road. In a similar manner any material drawn from the trough 77 by blower 91 is discharged outwardly beyond the shoulder of the road where the same is out of the way.

The advantages of my invention are manifest. An extremely practical construction is provided whereby the shoulders of roads may be readily worked by a machine traveling upon the surface portion of the road. By means of my invention the weeds may be removed from the shoulder and at the same time the shoulder leveled off. With my invention the clumps of earth removed are broken up into finer particles which drop through the slat conveyor and are deposited back upon the road. The scraper at the rear of the device levels off the earth so deposited. My invention may be used in conjunction with a road grader, truck or any other similar wheel supported structure. My invention is simple to operate and effective in producing the desired results.

Changes in the specific form of my invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

I claim:

1. A road working machine comprising a wheel supported frame, a conveyor attached to

said frame and extending transversely thereof and across the shoulder of the road, said conveyor substantially throughout the length thereof engaging the surface of the road to remove weeds, earth, etc. throughout its extent from the shoulder and to convey the same inwardly from the edge of the road, a slat conveyor carried by the frame and extending longitudinally thereof and receiving the weeds discharged from said first conveyor, said slat conveyor operating to discharge the earth through the same and back upon the road and the weeds at the end thereof, and another conveyor carried by said frame and extending transversely thereof, said last named conveyor receiving the weeds from the slat conveyor and discharging the same outwardly beyond said shoulder.

2. A road working machine comprising a wheel supported frame, a conveyor attached to said frame and extending transversely thereof and across the shoulder of the road, said conveyor being positioned in close proximity to the surface of the road and being adapted to remove weeds, earth, etc., from the road and to move the same inwardly from the edge of the road, a second conveyor extending across said frame and positioned above said first conveyor, said second conveyor being adapted to discharge outwardly and beyond the shoulder of the road, and a slat conveyor disposed between said discharge end of the first conveyor and the receiving end of the second conveyor, and inclining from said first conveyor up to said second conveyor, said slat conveyor separating the earth from the weeds and delivering the weeds to the second named conveyor.

3. A road working machine comprising a wheel supported frame, a conveyor attached to said frame and extending transversely thereof and across the shoulder of the road, said conveyor being positioned in close proximity to the surface of the road and being adapted to remove weeds, earth, etc., from the road and to move the same inwardly from the edge of the road, a second conveyor extending across said frame and positioned above said first conveyor, said second conveyor being adapted to discharge outwardly and beyond the shoulder of the road, and a slat conveyor disposed between said discharge end of the first conveyor and the receiving end of the second conveyor, and inclining from said first conveyor up to said second conveyor, said slat conveyor separating the earth from the weeds and delivering the weeds to the second named conveyor, and means cooperating with said slat conveyor for breaking up the earth carried thereby and causing the same to pass through said slat conveyor.

4. A road working machine comprising a wheel supported frame, a conveyor attached to said frame and extending transversely thereof and across the shoulder of the road, said conveyor being constructed to remove weeds, earth, etc., from the shoulder and to convey the same inwardly from the edge of the road, separating means for separating weeds from the earth carried by the frame and deposited at the discharge end of said conveyor, and a second conveyor extending transversely of the shoulder and carried by said frame, said second conveyor receiving the weeds discharged by said separating means and conveying the same outwardly beyond said shoulder, and a leveling device behind said slat conveyor for smoothing the earth deposited upon said shoulder by said slat conveyor.

5. In combination with a longitudinally extending main frame having supporting wheels at

the forward and rearward ends thereof and adapted to travel adjacent the shoulder of a road, a laterally extending frame carried by said main frame and extending cross the shoulder of the road, means on said lateral frame for removing weeds, earth, etc., from the shoulder, means on the lateral frame for separating weeds from the earth, and means on said lateral frame for discharging the weeds outwardly beyond the shoulder and the earth back upon the shoulder.

6. A road working machine comprising a wheel supported frame, means attached to said frame and extending across the shoulder of the road for removing weeds, earth and snow, etc., from the shoulder, separating means carried by the frame for separating the weeds from the earth, a discharge conveyor supported by the frame and carry the weeds and snow adhering thereto in an outward direction, and a blower connected with said last named conveyor for removing the snow from the weeds and for blowing the snow outwardly beyond said shoulder.

7. A road working machine comprising a wheel supported frame, a conveyor attached to said frame and extending across the shoulder of the road for removing weeds, earth, etc., from the shoulder, said conveyor including a flexible shaft journaled at its ends, flights on said shaft forming a screw, said shaft being bent to conform to the curvature of the shoulder of the road, a mold board disposed in proximity to said screw, said conveyor operating to cut off weeds and irregularities on the upper surface of the road and carrying the same toward one end thereof, and means for receiving the material discharged from said conveyor.

8. A road working machine comprising a wheel supported frame, a conveyor attached to said frame and extending across the shoulder of the road for removing weeds, earth, etc., from the shoulder, said conveyor including a flexible shaft journaled at its ends, flights on said shaft forming a screw, said shaft being bent to conform to the curvature of the shoulder of the road, and a mold board disposed adjacent to said screw, said conveyor operating to cut off weeds and irregularities on the upper surface of the road and to discharge the same toward one end of said conveyor, said mold board being constructed in two sections, one fixed and the other hingedly connected to the first section, and means for swinging said hinged section to shift the position of said mold board and screw with respect to the surface of the road, and means for receiving the material discharged from said conveyor.

9. A road working machine comprising a wheel supported frame, a conveyor attached to said frame and extending across the shoulder of the road for removing weeds, earth, etc., from the shoulder, a slat conveyor receiving the material discharged by said first named conveyor, said slat conveyor serving to separate the weeds from the earth, a shaft extending above said slat conveyor and having prongs thereon for engagement with the earth to break up the same, a transverse conveyor carried by said frame and receiving the weeds discharged by said slat conveyor and conveying the same outwardly beyond said shoulder.

10. A road working machine comprising a wheel supported frame, a conveyor attached to said frame and extending across the shoulder of the road for removing weeds, earth, etc., from the shoulder, a slat conveyor receiving the material discharged by said first named conveyor, said slat conveyor serving to separate the weeds from

the earth, a shaft extending above said slat conveyor and having prongs thereon for engagement with the earth to break up the same, a transverse conveyor carried by said frame and receiving the weeds discharged by said slat conveyor and conveying the same outwardly beyond said shoulder, a blower associated with said first named conveyor, and means driven by said shaft for operating said blower.

11. In combination with a longitudinally extending main frame having supporting wheels at the forward and rearward ends thereof, a case attached to one side of said frame and extending vertically thereof, a laterally extending frame carried by said case, means for bracing said lateral frame with respect to said main frame, means attached to said lateral frame and extending across the shoulder of the road for removing the weeds, earth, etc., from the shoulder, separating means carried by said lateral frame for separating the weeds from the earth, a discharge conveyor carried by said lateral frame, and carrying the weeds discharged by said separating means outwardly beyond the shoulder, and transmission means within said case for driving said removing means, separating means and conveyor.

12. A road working machine comprising a wheel supported frame, a conveyor attached to said frame and extending substantially throughout its length along the ground and outwardly from said frame, a second conveyor attached to said frame and extending outwardly therefrom and being disposed at an elevation above said first conveyor and separating means including a third conveyor carried by said frame and disposed in proximity to the inner end of said first conveyor, said third conveyor moving material from said first conveyor to said second conveyor.

13. A road working machine comprising a wheel supported frame, a conveyor attached to said frame and extending substantially throughout its length along the ground and outwardly from said frame, a second conveyor attached to said frame and extending outwardly therefrom and being disposed at an elevation above said first conveyor, and a perforate conveyor operating as a separating device, carried by said frame and disposed in proximity to the inner end of said first conveyor, said perforate conveyor moving material from said first conveyor to said second conveyor.

14. A road working machine comprising a wheel supported frame, a conveyor attached to said frame and extending substantially horizontally outwardly therefrom laterally of the direction of travel of the machine, means for operating said conveyor to cause the same to move material from its outer end toward its inner end, a second conveyor carried by said frame and extending laterally therefrom in the same general direction as said first conveyor; means for operating said second conveyor to cause the same to move material from its inner end toward its outer end, and separating means between the inner ends of said conveyor and including a conveyor receiving the discharge from the first conveyor and discharging upon said second conveyor.

15. A road working machine comprising a wheel supported frame adapted to be disposed at the edge of the road, a conveyor carried by said frame and substantially throughout its length engaging the surface of the road and picking up material on the road, said conveyor directing the material inwardly from the edge of the road, a second conveyor carried by said frame and extending in the same general direction as said first conveyor, said

second named conveyor being situated with its receiving end innermost and spaced from the discharge end of the first conveyor and adapted to direct material outwardly of the road, a slat conveyor carried by said frame and disposed between said first and second conveyors and delivering material from the first conveyor to the second conveyor and a breaking device operating in conjunction with said slat conveyor.

16. A road working machine comprising a wheel supported frame adapted to be disposed at the edge of the road, a conveyor carried by said frame and substantially throughout its length engaging the surface of the road and following along said surface for picking up material on the road, said conveyor directing the material inwardly from the edge of the road, a second conveyor carried by said frame and extending in the same general direction as said first conveyor and situated above the same, said second named conveyor being arranged with its receiving end innermost and spaced from the discharge end of the first conveyor and above the same and adapted to direct material outwardly of the road, a slat conveyor carried by said frame and disposed between said first and second conveyor and arranged in up-

wardly inclined relation to deliver material from the first conveyor to the second conveyor and a breaking device operating in conjunction with said slat conveyor.

17. A road working machine comprising a wheel supported frame, a conveyor attached to said frame and extending outwardly therefrom laterally of the direction of travel of the machine and in a direction following the surface of the road, means for operating said conveyor to cause the same to move material from its outer end toward its inner end, separating means carried by said frame at the inner end of said conveyor and adapted to receive the discharge therefrom, the material separated being deposited back upon the road, and another conveyor carried by said frame and extending laterally therefrom in the same general directions as said first conveyor, said second conveyor receiving the discharge from said separating means, and means for operating said second conveyor to cause the same to move material from its inner end to its outer end and to discharge the same outwardly beyond the outer end of said first conveyor.

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