June 30, 1964 C. L. ELENBURG 3,138,883

FLEXIBLY SUSPENDED SCRAPER RECEPTACLE

Filed Aug. 28, 1962 4 Sheets-Sheet 1

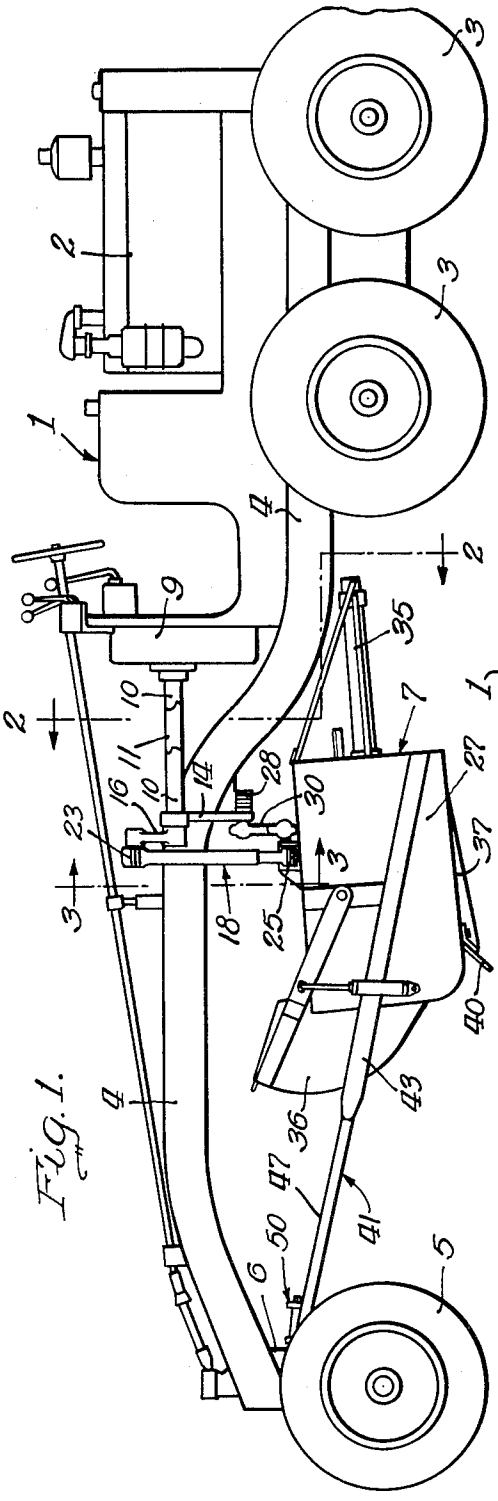


Fig. 1.

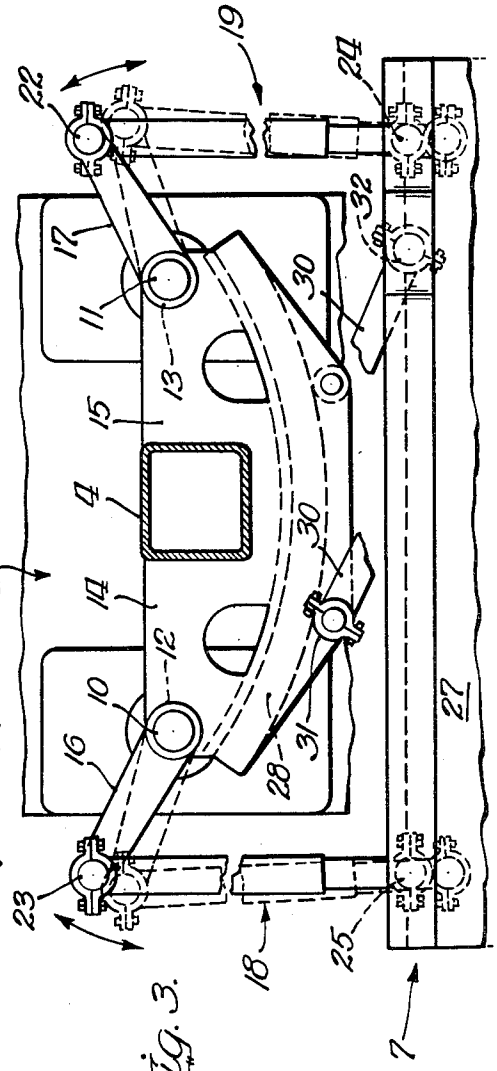


Fig. 3.

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4 Sheets-Sheet 2

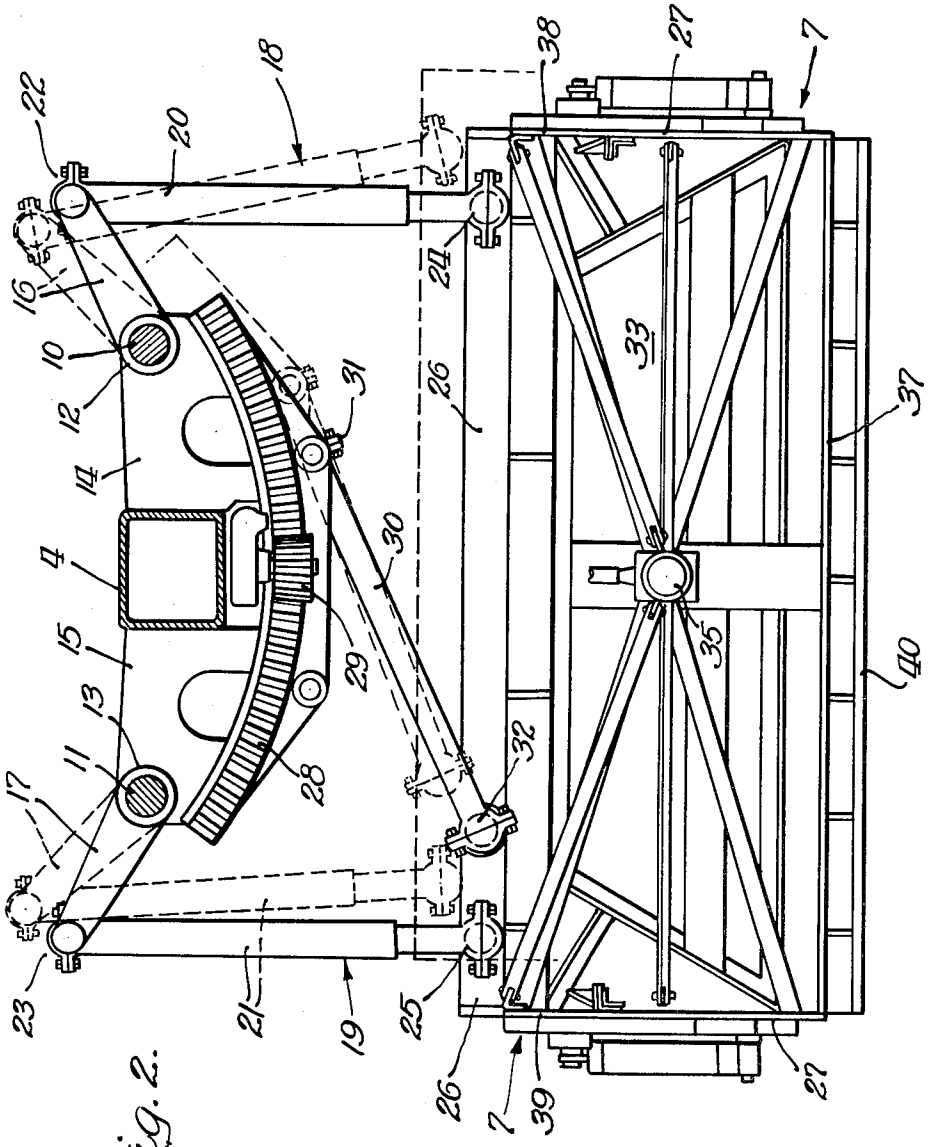


Fig. 2.

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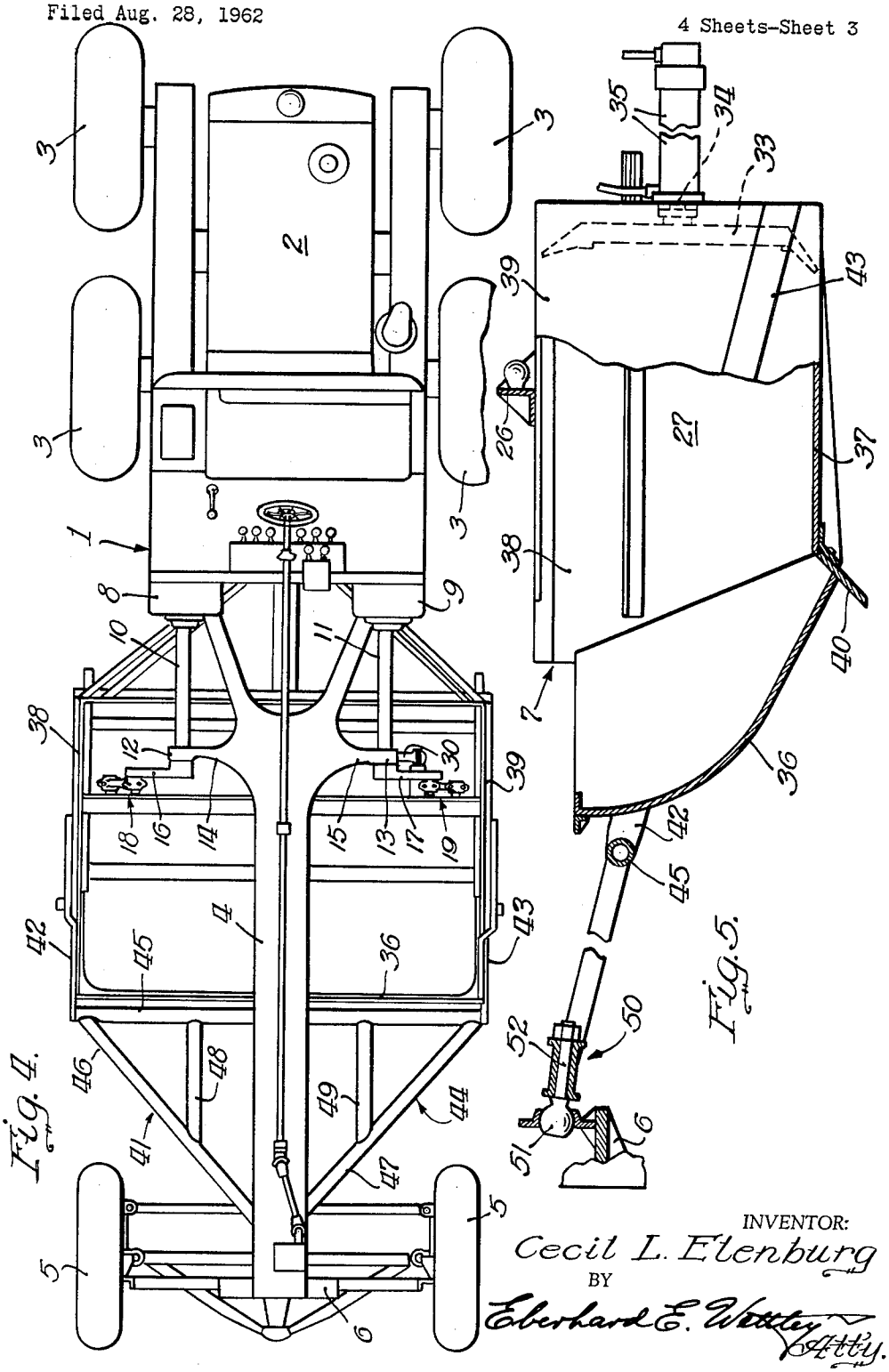


Fig. 4.

Fig. 5.

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Fig. 6.

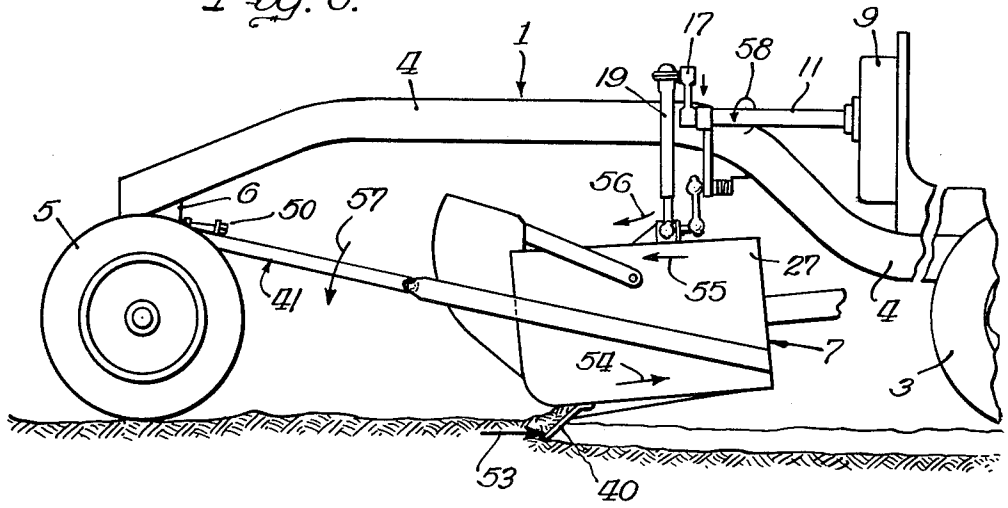


Fig. 7.

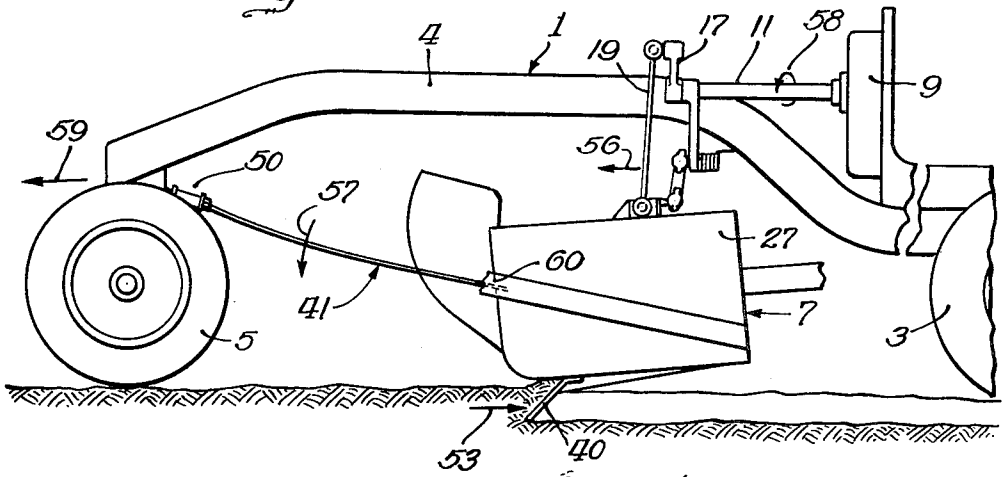
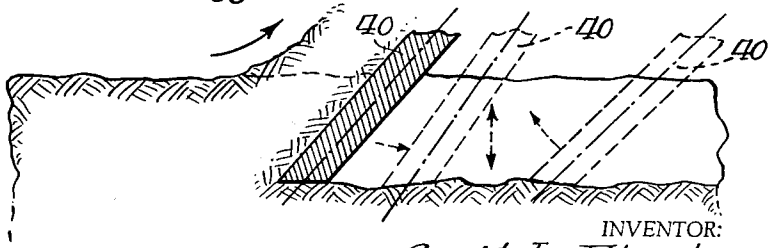


Fig. 8.



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United States Patent Office 3,138,883 Patented June 30, 1964

3,138,883
FLEXIBLY SUSPENDED SCRAPER RECEPTACLE

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Filed Aug. 28, 1962, Ser. No. 220,354
20 Claims. (Cl. 37—124)

This invention relates to certain improvements embodied in earth moving vehicles and in earth or material handling equipment. More specifically, the new and novel apparatus of this invention can be supplied as an integral assembly carried by appropriate wheel means so as to be provided as a complete grader unit or the like; or the apparatus can be adapted as an accessory structure readily attachable with a road working machine for operative use and control by such a machine. For example, the accessory structure can be connected with a wheeled motor grader as substitute equipment for some other piece of road working machinery as a grader or scraper blade of the wheeled motor grader. Thus the scraper receptacle is rendered efficiently operable when attached to the frame assembly of a grader using the mechanical control equipment to manipulate the scraper receptacle.

In greater detail, the present invention comprises the provision of a universally functional type of flexible suspended scraper receptacle carried by or suspended from a frame or frame part of a mobile unit to obtain a vibratory or shudder type of action by the receptacle, bucket or bowl under operative conditions to enhance and induce a continuous, positive scraping and loading function under the control of an operator on the mobile unit.

The developed arrangement eliminates blade and/or bucket stoppage by or within the material being worked or acted upon, eliminating retardation of the scraping function and the forward progress of the mobile unit. The scraper receptacle assembly herein disclosed overcomes the objectionable difficulties encountered by excessively high powered mobile vehicles performing like operations and which are usually augmented by other accessory vehicles such as high powered bulldozers all acting in tandem to force a scraper bucket through the selected material in the working path being serviced.

This application is a continuation-in-part of my copending application, Serial No. 715,918, filed February 18, 1958, now Patent number 3,052,049, covering an invention in Earth Moving Devices.

One object of the present invention is to provide a support or carrying means arranged to suspend a receptacle in the form of a scraper bowl or bucket in a manner which induces a self-developed cooperative resilient action in the scraper bucket which counteracts any retardation or progress interference by the material being engaged by the blade or bucket to establish a smooth and continuous forward cutting and loading cycle for such scraper bucket and its working parts as the blade, all under operative conditions.

Another object is to provide a scraper bucket that will perform efficiently and under complete control with moderate power and without the use of supplementary power equipment or other separate mechanisms other than the vehicle equipment to which the scraper bucket is attached and from which it derives its operative functions.

It is a further object to provide a bowl or bucket of this type which is regulated laterally and vertically or in combinations of such actions to be able to tilt the scraper receptacle in either a horizontal or vertical plane and in variations of both all obtainable and functionable under the flexibly suspended apparatus contributing to the free, steady and continuous forward motion of the scraper receptacle. Oscillatory and vibratory motions are developed under operation to keep the scraper bowl and blade in operation.

The regulation and control of the scraper means may be well understood and is more fully described and disclosed in my co-pending application, Serial No. 715,918, filed February 18, 1958, which is directed to such improvements.

Other objects and advantages relating to the invention herein disclosed shall hereinafter appear in or become evident from the following detailed description relating to the flexibly suspended scraper receptacle shown in the accompanying drawings and forming a part of this specification.

In the drawings:

FIG. 1 is a side elevational view of a conventional motor grader embodying the device of this invention, certain details of structure having been omitted for the sake of clarity and which are more specifically shown and described in my co-pending application, Serial No. 715,918, which has been hereinbefore mentioned;

FIG. 2 is a general transverse vertical sectional view taken substantially in the plane of the line 2—2 indicated in FIG. 1;

FIG. 3 is another fragmentary view similar to FIG. 2, but as viewed from the opposite side thereof somewhat as indicated by the line 3—3 shown in FIG. 1;

FIG. 4 is a general plan view of the motor grader and the scraper bowl or receptacle as the latter is associated with such a vehicle and controlled by the equipment of this vehicle in performing its various operative functions;

FIG. 5 is a partial longitudinal sectional view of the scraper bowl or receptacle to better illustrate certain details thereof;

FIG. 6 is a fragmentary side elevational view of the suspended receptacle or scraper bowl to diagrammatically disclose the action which develops as the mobile unit or vehicle is set into forward motion;

FIG. 7 is a similar illustration with some of the salient parts diagrammatically shown to further express the operational stage that ensues and which contributes to the vibratory or shudder action of the earth or material carrying receptacle;

FIG. 8 is a diagrammatic illustration of the scraper bowl blade per se in section to show in a general way the blade oscillation which occurs during the forward progress of the equipment of this invention.

For the stake of consistency in the following description, the receptacle, bowl or bucket are different terms used for a scraper device used to load, carry and unload the material or earth being acted upon by a motor grader scraper, and the term scraper bowl will hereinafter be used through the specification in a more or less generic sense to refer to all analogous devices of the type mentioned.

Referring to FIGS. 1 and 4, the numeral 1represents a conventional type of motor grader unit having a power unit 2 supported over the wheels 3 on a frame 4 which frame extends to the vehicle steering wheels 5 having a suitable carriage 6 upon which the frame 4 rests. Frame 4 is of the humpbacked type from which the usual conventional scraper blade is normally suspended and operated, this blade having been removed in the drawings to make room for the scraper bowl 7 of the present invention.

The motor grader 1 is equipped with a pair of power mechanisms 8 and 9 being supplied with motive power from the power unit or engine 2, the mechanisms 8 and 9 including the usual gear transmission assemblies. The mechanisms 8 and 9 are provided with long drive shafts 10 and 11 that extend in outboard fashion through bearings 12 and 13 supported by frame projections 14 and 15 disposed laterally and oppositely from the frame 4.

As best seen in FIG. 2, the shafts 10 and 11 fixedly carry cranks 16 and 17 for arcuately swinging motion beyond

the frame 4 projections 14 and 15. Link means 18 and 19 are interposed between the crank ends and the scraper bowl 7 and comprise links 20 and 21 provided with universal ball and socket assemblies 22 and 23 at the crank ends and with similar ball and socket assemblies 24 and 25 at the scraper bowl ends, the latter having connection with a scraper bowl member such as the cross angle piece 26 that spans the top of the bowl 27 per se of the scraper bowl or receptacle unit 7. Thus the bowl is swingably suspended from the frame by the dual link means 18 and 19 permitting fore and aft motion as well as transverse motion of the bowl 27, or any compound movement thereof along angular relations such as made possible by this type of compound link suspension.

Lateral swinging and control of the scraper bowl 7 is accomplished through the rack 28 and pinion 29 carried by the frame 4 which motion is transmitted through the transverse diagonally directed link 30 connected with ball and socket units 31 at the rack assembly and 32 on the cross angle pice 26 as more completely described in the co-epnding application previously mentioned.

Bowl 27 is better illustrated in FIG. 5 and is constructed as a receptacle with an open back normally closed by an ejector blade 33 guided for motion through bowl 27 and so actuated by a ram or piston rod 34 of the piston cylinder 35 secured to a suitable framework at the rear of the bowl or receptacle 27. A swingable hood 36 controls the forward opening of bowl 27 for purposes noted in my co-pending application.

The bottom 37 of the bowl is contiguous with the sides 38 and 39 and includes a forward cutting blade 40 that is secured to the bowl bottom and angularly pitched downwardly for cutting purposes as shown in FIG. 5. The blade 40 provides the inclined loading means to direct material into the bowl proper under the adjustably raised hood 36 and toward the ejector blade 33. Blade 40 also functions as the depth gauge means to cut or to scrape off predetermined surface quantities of material under the forward motion of the vehicle or motor grader unit 1.

The scraper bowl assembly 7 is provided with a further flexible suspension apparatus generally designated at 41 in the form of a unitary hitch structure supplementing the other two suspension link mechanisms 18 and 19 previously described.

The hitch structure 41 functions as a drawbar for the bowl or receptacle and provides a single flexible supporting member comprising a forked drawbar providing arms 42 and 43 rigidly attached to the sides 38 and 39 of the bowl or receptacle 27. Arms 42 and 43 are joined by a frame 44 of relatively flexible members comprising a cross tube 45, diagonal tubular runners 46 and 47 with some intermediate reinforcing tubular braces such as 48 and 49. As shown in FIG. 5, the towing end of the hitch structure 41 is connected with a swingable and rotational assembly 50 connected with the forward end of frame 4 and at the carriage 6 thereof. With the use of assembly 50, the bowl assembly 7 and by means of the flexible hitch means 41 located between the forward frame end and the bowl 27, such a bowl assembly is permitted free lateral arcuate swinging motion about the ball and socket unit 51 and at the same time such bowl assembly is also rockable about the axis of the sleeve 52, which sleeve is interposed between certain of the structural members of the single unitary flexible suspension apparatus 41. The described motions are further rendered possible by reason of the swingable link means 18 and 19, the latter two devices and the universal assembly 50 thus providing the unique bowl suspension that all contribute to the efficient and positive bowl filling action as will hereinafter be more fully described.

It should be noted and understood that the long drive shafts 10 and 11 do not only provide the power means whereby to introduce and control the desired orientation wanted in using the bowl 27, but these same shafts perform a further advantageous function of establishing torsional spring means for interposing resilient structure between the frame of the vehicle proper and the scraper bowl means 7 which comprises the material handling facility of the device of this invention. FIG. 3 illustrates the spring action developed by the torsional properties of shafts 10 and 11. The full lines in this illustration show, for example, an adjusted arrangement of the shafts and links, by the power means 8 and 9, to suspend the scraper bowl 7 in the full line position indicated. The broken lines generally indicate the resilient action developed under operating conditions whereby shafts 10 and 11 act under torsional forces transmitted thereto by the link means 18 and 19 and their poins of suspension at the outer ends of the cranks 16 and 17, the latter inducing the twist in each of their respective power shafts under the weight of the scraper bowl.

It is, therefore, obvious that the scraper bowl is hanging from a two point resilient arrangement connected through the mounting means on the frame of the vehicle and that the single flexible hitch means to directly draw the scraper bowl forward also provides a resilient deflectable draw bar for the support of the scraper bowl at another location on the bowl through universal means mounted on the frame.

As hereinbefore related, bucket devices are necessary in road building and maintenance, but the difficulty has been to move such devices and to do so with a minimum of effort and cost. Greatly exaggerated power mechanisms are employed. Progress is slow and extremely costly with total lack of efficient operation.

With the arrangement of the described flexibly suspended scraper receptacle, the objectionable factors noted have been eliminated. FIGS. 6, 7 and 8 are used to demonstrate the resultant action of the scraper bowl unit 7 as it functions when embodied into the apparatus described which suspends the bowl from a frame part of a power motor grader.

In FIG. 6, the link means 18 and 19 are adjusted by the cranks to carry the bowl 27 for cutting away a given surface layer of the roadbed. The arrows generally indicate the resultant action generated as the machine advances under its own power. Arrow 53 is the reactionary force encountered in cutting and loading the bowl 27 which tends to push the bowl 27 back as per arrow 54 to induce a rotational action about some horizontal transverse bowl axis. This condition tends to move the upper part of the bowl 27 forwardly as at arrow 55 causing link means 18 and 19 to swingably adjust forwardly as per arrow 56.

FIG. 7 diagrammatically illustrates this general operative condition which further simultaneously induces a downward deflection in the flexible draw bar hitch means 41 as shown by arrow 57 in FIGS. 6 and 7. Also, while the suspension links swing to comply with the bowl motion, the same links are directly tied in with the interposed spring action of the two torsional power shafts 10 and 11 acting as indicated by the arrow 58 in FIGS. 6 and 7.

The various tilting and rocking motions developed by the bowl suspension apparatus are directly transmitted to the cutting and loading blade 40 with FIG. 8 schematically illustrating certain angular deviations of the blade under this live operative action. The blade 40 angle is constantly changing with the bodily shifting adjustments of the bowl made possible by the use of the group of flexible suspension units herein employed. The blade angle changes in FIG. 8 are varied in a longitudinal plane and relative to an upright position as well as with respect to the surface of the ground. Any transverse angular change of the bowl 27 correspondingly changes the transverse position of the blade a like amount.

In FIG. 7, reaction on the blade at arrow 53 induces a bow or deflection in the flexible suspension apparatus 41 subject to constant periodic return to the normal

straight line position of **41** as seen in FIG. 6. This flexing function coupled with the forward pull of the machine as indicated by arrow **59** is transmitted to the hitch means or draw bar unit **41** and develops a buggy motion to the bowl **27**, simulating the action generated by a trotting horse within a buggy hitch, except that the hitch of the present invention is fastened to the bowl **27** while a buggy hitch is normally pivoted on the wheel frame or axle means of a buggy.

The blade **40** is therefore vibrated or oscillated in unison with the bowl motions and this kind of agitation of the blade in the material confronting the blade causes the latter to continuously maintain its cutting and loading function. Due to the swingable suspension of the bowl at **50** coupled with the torsional vertically operative spring action of the shafts **10** and **11**, the blade is further permitted to oscillate and/or vibrate a given amount to dig its way ahead in the line of travel cutting through the material while dipping under or over stones that may tend to obstruct the path of advance of the blade. With these various functions the bowl is also capable of arcuate motion laterally of the frame **4** about the universal forward hitch **50**, so that all of these possible movements and various combinations of these movements contribute to keeping the blade **40** alive and continually operative during the forward advance of the motor grader. It is also contemplated that the draw bar hitch means **41** can, under certain conditions as when the blade passes over an obstruction, cause this pulling apparatus to flex upwardly to accommodate this sort of a cutting pass of the blade. In such cases the lifting power of the torsional shafts **10** and **11** will provide aid by momentarily lifting the bowl **27** to help the blade pass over an obstruction.

Should the blade pass under a rock or stone, the same suspension instrumentalities will function similarly although oppositely whereupon the rock or stone is carried over the blade into the bowl. All of these actions apply to multiple rocks, stones or other obstructions of like kinds.

Under operation, the bowl **27** and its blade **40** are subjected to fore and aft oscillation as the flexible hitch draw bar **41** bows out of its normal straight line relationship. When this occurs, the distance between point **60** on the bowl **27** and the universal mounting of the hitch means **41** at **50** as shown in FIG. 7, decreases to draw the bowl and blade forwardly in pendulum fashion on its other flexible suspension means. As the hitch means moves toward its original normal memory shape, the inertia of this act will conceivably override its normal position to induce additional fore and aft motion to the bowl and blade. The forward pull on the draw bar will also enter into the deflective action of the draw bar.

And while in operation, the bowl and blade are capable of vertical reciprocal or up and down motion under the torsional resilience of the power shafts **10** and **11**. These various bodily actions of the bowl and blade are resolved into many different significant compound motions all contributing toward the maintenance of a continuously live active blade for the bowl. The blade thus shudders and/or oscillates its way through the material encountered thereby and the blade is not permitted to assume a static relation with the material under operation.

The motor grader hereinbefore described and embodying the scraper bowl or receptacle of the present invention incorporating the flexibly suspension apparatus carrying the scraper bucket in pendulum fashion has demonstrated under field tests that the combination of the aforesaid apparatus and the flexible hitch means operates efficiently and continuously in the performance of its designed purpose of scraping, grading, loading and unloading materials for the construction and maintenance of roads and highways, as well as for accomplishing other analogous duties for which these devices are intended.

The foregoing description and disclosure relates to one embodiment of the invention. Certain changes in the various elements or in the combinations of elements are contemplated without departing from the fundamental concept of the present invention. The extent of such changes or modifications shall, however, be governed by the breadth and scope of the language contained in the following claimed subject matter.

What I claim is:

1. In a mobile vehicle, in combination, a frame, a scraper bucket for said frame adapted for road and earth working purposes, cooperative swingable supporting mechanisms, certain of said mechanisms being connected with support means on said frame and with one end portion of said bucket to provide means to carry said one end of said bucket for universal motion relatively to the frame, one other of said swingable supporting mechanisms being rigidly connected with the other end of said bucket and with said frame to pull said bucket, said other swingable supporting mechanism including flexible members functioning to flex vertically to impart a predetermined oscillatory motion to the attached end of the bucket during the operation of the bucket and with respect to the other swingable bucket supporting mechanisms.

2. In a mobile vehicle of the combination set forth and defined in claim 1, wherein one of said cooperative swingable supporting mechanisms comprises a flexibly constructed hitch extending from the frame to said bucket, said hitch including a resilient portion to flex with respect to the frame and with respect to said bucket to induce a vertical oscillatory motion to the hitch connected portion of said bucket during the operation of said bucket.

3. In a mobile vehicle as in claim 1 with the inclusion of a material cutting blade on said bucket, said oscillatory motion of said bucket being directly transmitted to said blade to likewise oscillate the blade while said bucket is in operation.

4. In a mobile vehicle as in claim 2 with the inclusion of a material cutting blade on said bucket, said oscillatory motion of said bucket being directly transmitted to said blade to likewise oscillate the blade while said bucket is in operation.

5. In a mobile vehicle as in claim 1 with the addition of a material cutting blade on said bucket, said oscillatory motion of said bucket being directly transmitted to said blade causing blade oscillation while said bucket is in operation, and regulatory means are connected with at least one of said swingable supporting mechanisms to control the elevation of the cutting blade of the bucket in relation to the frame and to the surface being serviced by said vehicle bucket.

6. A material handling machine comprising, in combination, a structural part on said machine, a scraper bowl, universal suspension means on said structural part supporting means connected with said structural part through said universal means and connected with the rear portion of said bowl to support said portion of the bowl for free motion relatively to said structural part, a flexible hitch unit connected with said bowl at the forward end thereof to support this end of the bowl and including mechanism to mount said hitch upon said structural machine part, said flexible hitch unit comprising a draw bar for the bowl and to bodily vibrate the adjacent end of the scraper bowl through the motion of the structural part under the operation of said machine, flexing of said hitch unit under operation causing said bowl to move relatively toward and away from the point of connection of the flexible hitch unit with said structural part and under the suspension of the bowl by said universal suspension means.

7. In the combination set forth in claim 6, wherein said flexible hitch unit is rigidly secured to the scraper bowl at its forward end and said mounting mechanism of said hitch comprises a universal means to allow said

scraper bowl free bodily swinging motion and rotational motion about the longitudinal axis of the flexible hitch unit.

8. In the combination set forth in claim 6, wherein said supporting means includes resilient structural means to permit vertical oscillatory motion of said scraper bowl in relation to said structural part through said bowl supporting means.

9. A road and material scraper vehicle comprising a frame, a scraper bowl, individually operable orientation suspension mechanisms connected between said frame and said bowl to freely carry said bowl in tilting relation from the frame, a single flexible bowl supporting suspension mechanism having one end thereof rigidly connected with said bowl to support the bowl and to control the free tilt thereof and extending to and rockably mounted upon said frame to induce forward motion to said bowl, said orientation suspension mechanisms each comprising a link element on said bowl, a power shaft rotationally mounted on said frame, and a crank member fixed to said shaft and connected with the link element, said power shaft, when active, providing means to raise and lower said bowl to orient the latter in a given relation with respect to the frame, said power shaft further providing torsional spring suspension means to allow vertical oscillation and tilt of said scraper bowl under operative conditions under the controlled guidance of said single flexible bowl supporting suspension mechanism which rockably supports the bowl.

10. In the combination defined in claim 9 wherein the link elements each include ball and socket connections with the bowl and with their respective cranks, and said mounting of the single flexible bowl supporting suspension mechanism on said frame comprises a further universal motion arrangement for the support of said bowl.

11. A road and earth working vehicle comprising a frame, a scraper bucket, an earth cutting blade on said bucket, suspension means supported from said frame at a first location thereon and connected with said bucket rearwardly with respect to the cutting blade of the bucket to carry the bucket beneath said first frame location, a further suspension means comprising a single unitary hitch means rigidly connected with said bucket and extending along the frame between said bucket and said frame for attachment at a second location on said frame spaced from said bucket and from said suspension means at said first location, and universal means on said frame at said second location to receive said single unitary hitch means to suspend the bucket for swinging movement relative to said frame, one of said suspension means being resilient to impart oscillatory action to said bucket under operative conditions to oscillate the bucket blade through the ground.

12. A road working vehicle comprising a wheeled frame, a scraper bucket disposed beneath said frame having a forward material cutting edge thereon, suspension members connected with said frame and connected with said bucket rearwardly of the cutting edge thereof to support the bucket at one location on said frame, and a single hitch member rigidly connected with said bucket and projecting freely away from the forward cutting edge of said bucket toward a point adjacent the frame, said hitch member including universal means to mount and support said hitch member on said frame at a second location disposed remotely with respect to the suspension members and to the bucket, at least one of said members being resilient and adapted to flex to oscillate the bucket vertically during operation to thereby simultaneously oscillate the forward material cutting edge of the bucket.

13. In the combination of claim 11, wherein universal means are supported by said frame to carry the suspension means for swinging movement relative to said frame from said first location to swingably suspend the bucket for cooperative swinging motion on said hitch means and about said universal means at the second frame location.

14. In the combination of claim 12, wherein the suspension members are provided with universal means to swingably support said members with respect to said frame.

15. In the combination of claim 12, with the addition of universal units on said suspension members to permit lateral universal oscillatory motion of the bucket together with its forward cutting edge while supported from said one location, and wherein said universal means comprises a ball and socket unit to connect said hitch member for universal motion about the second remote location on the frame to accommodate vertical oscillatory action of the bucket and its forward cutting edge relative to said second bucket support location.

16. A road and material scraper vehicle comprising, in combination, a frame, a scraper bucket carried by said frame, support means on said frame to suspend said bucket for lateral and vertical oscillation relatively to said frame and with respect to the ground comprising a single unitary towing element rigidly connected with the forward end of said bucket and extending to said frame, universal means on said frame to receive said towing element to swingably support the front end of said bucket, and vertically operable mechanisms carried by said frame and connected with the rear portion of said bucket to swingably support this portion of the bucket from said frame, one of said elements having vertically flexing properties to permit bucket oscillation relative to said frame and with respect to the road or the material being worked by said bucket.

17. A material handling vehicle comprising, in combination, a frame, a forwardly open material receptacle including a cutting blade at the forward edge of the receptacle to penetrate the material to load said receptacle, a single flexible support structure fixed to the receptacle at its open end and extending to said frame, universal means to join said support structure and frame to support said receptacle for universal motion on said universal means and in relation to said frame, additional support means to suspend the rear portion of said receptacle from another location on said frame spaced rearwardly from the open end of the receptacle and its blade, at least one of said support means including a power shaft to control and regulate the position of the receptacle in relation to the frame and to the ground while supported with said support structure from said universal means, said one support means embodying operable mechanism connected with its shaft to induce torsional force into said shaft developed by the weight of the receptacle and transmitted through its connected support means to said shaft to establish vibratory means for the vertical oscillation of the rear portion of said receptacle and to further impart vertical oscillation of the cutting blade by means of the forward support structure of said receptacle through said additional support means.

18. A vehicle comprising a support structure, a forwardly open earth manipulating receptacle for said vehicle, an earth engaging blade at the open end of said receptacle, suspension means each connected with said supporting structure and with said receptacle to the rear of and ahead of the receptacle blade location, certain of said suspension means including resilient parts to induce up and down vibratory displacement of different portions of said receptacle and its blade as the blade passes through the earth and along the surface being travelled by said vehicle, said connections of said suspension means fore and aft of the blade providing means to vary the tilt of the blade under operation, said suspension means ahead of the blade being a drawbar for the receptacle and comprising a single flexible member rigidly connected with the receptacle and having universal connection with the support structure.

19. In the combination set forth in claim 18, wherein said support structure includes power lift means and certain of said suspension means include operable connec-

tions with said power lift means for the bodily raising and lowering said receptacle on its drawbar.

20. A vehicle comprising a support structure, a forwardly open earth manipulating receptacle for said vehicle, an earth engaging blade at the open end of said receptacle, and suspension means each connected with said supporting structure and with said receptacle to the rear of and ahead of the blade location, certain of said suspension means including resilient means to induce up and down vibratory displacement of different portions of said receptacle and its blade as the latter passes through the earth and over the surface being travelled by said vehicle, said connections of said suspension means

with the receptacle fore and aft of the blade providing variable tilt to the blade under operation, at least one of said suspension means providing a vertically flexible hitch frame rigidly connected with said receptacle ahead of the blade to cause said receptacle to vibrate the blade as the receptacle moves with said vehicle.

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