

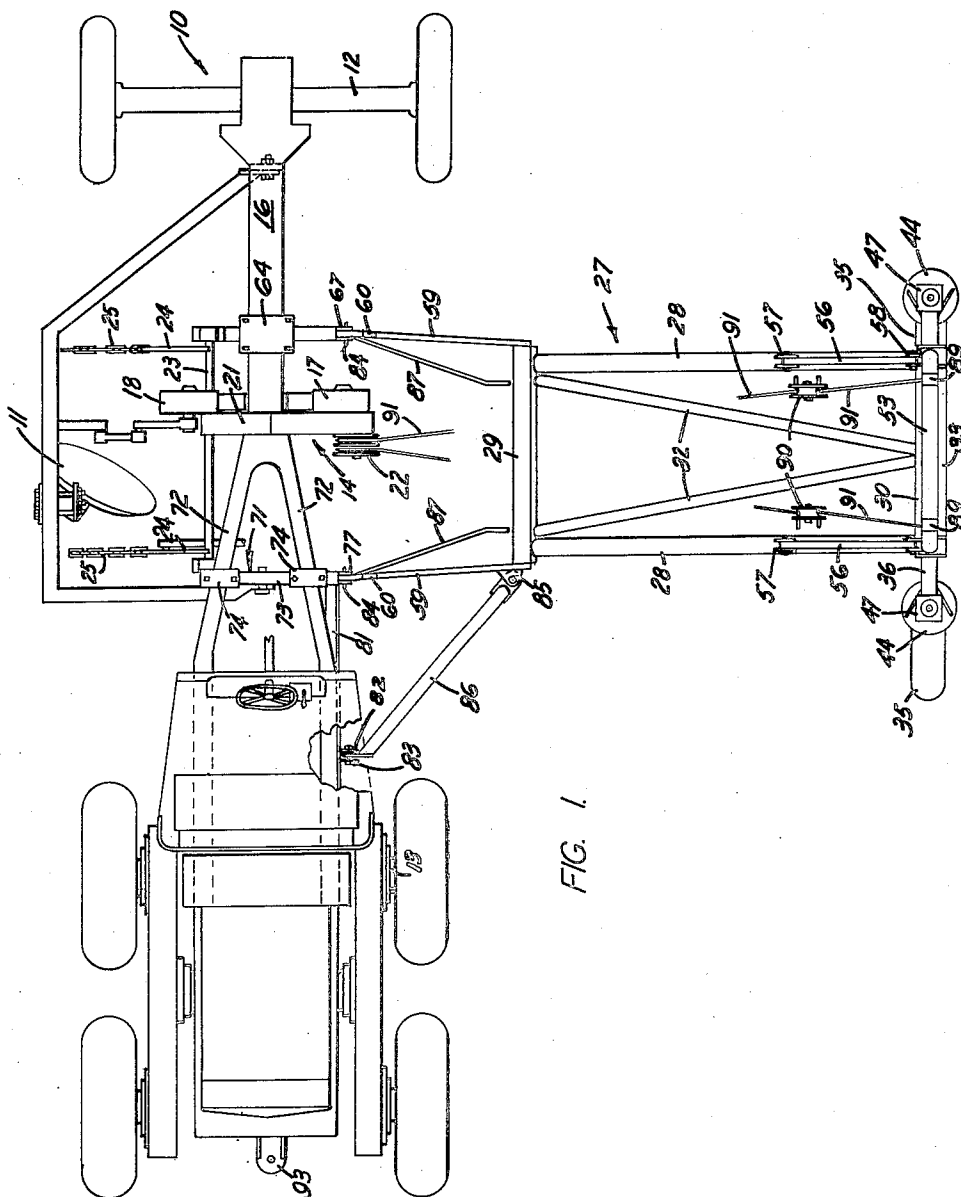
Dec. 3, 1957

V. H. REISSER
EXCAVATING MACHINE

2,814,889

Filed July 21, 1955

6 Sheets-Sheet 1



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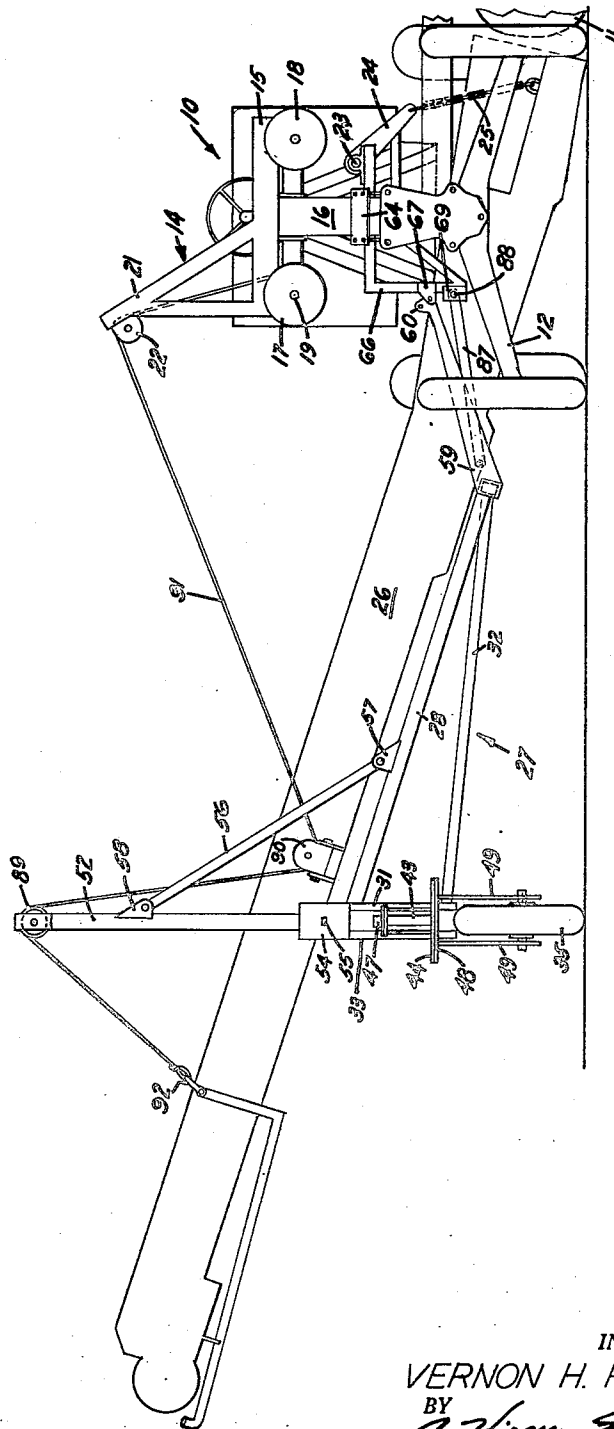


FIG. 2.

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6 Sheets-Sheet 3

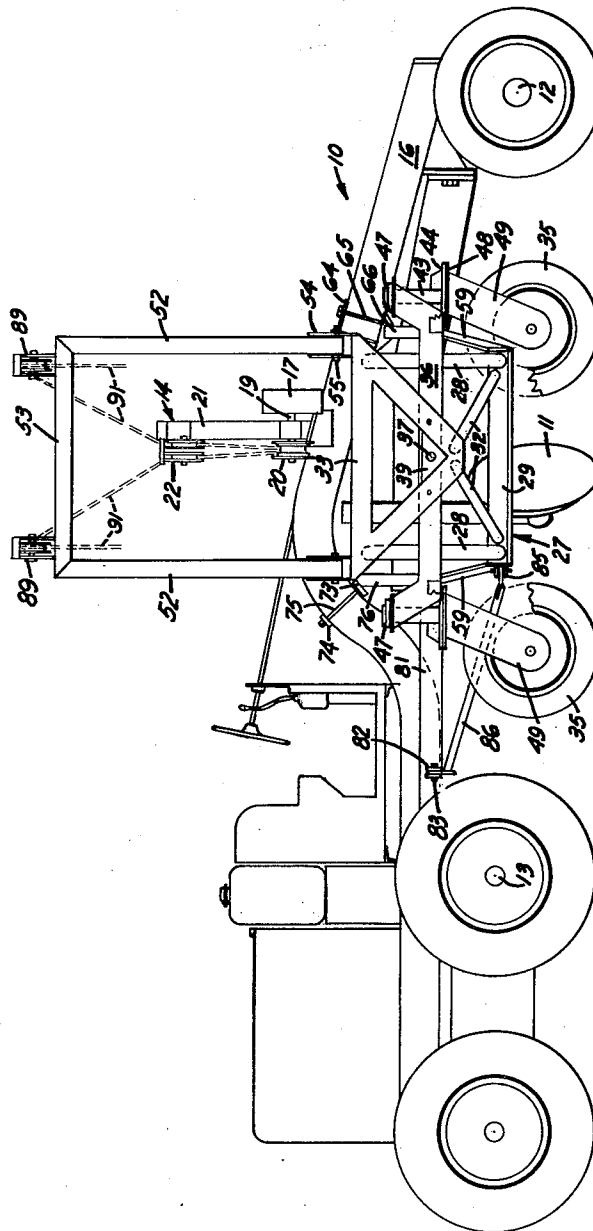


FIG. 3.

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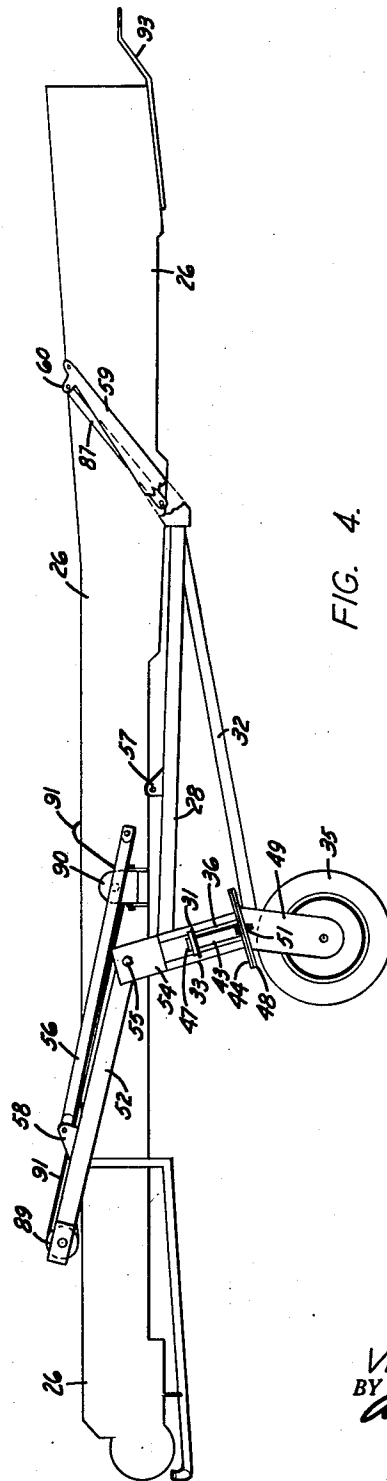


FIG. 4.

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6 Sheets-Sheet 5

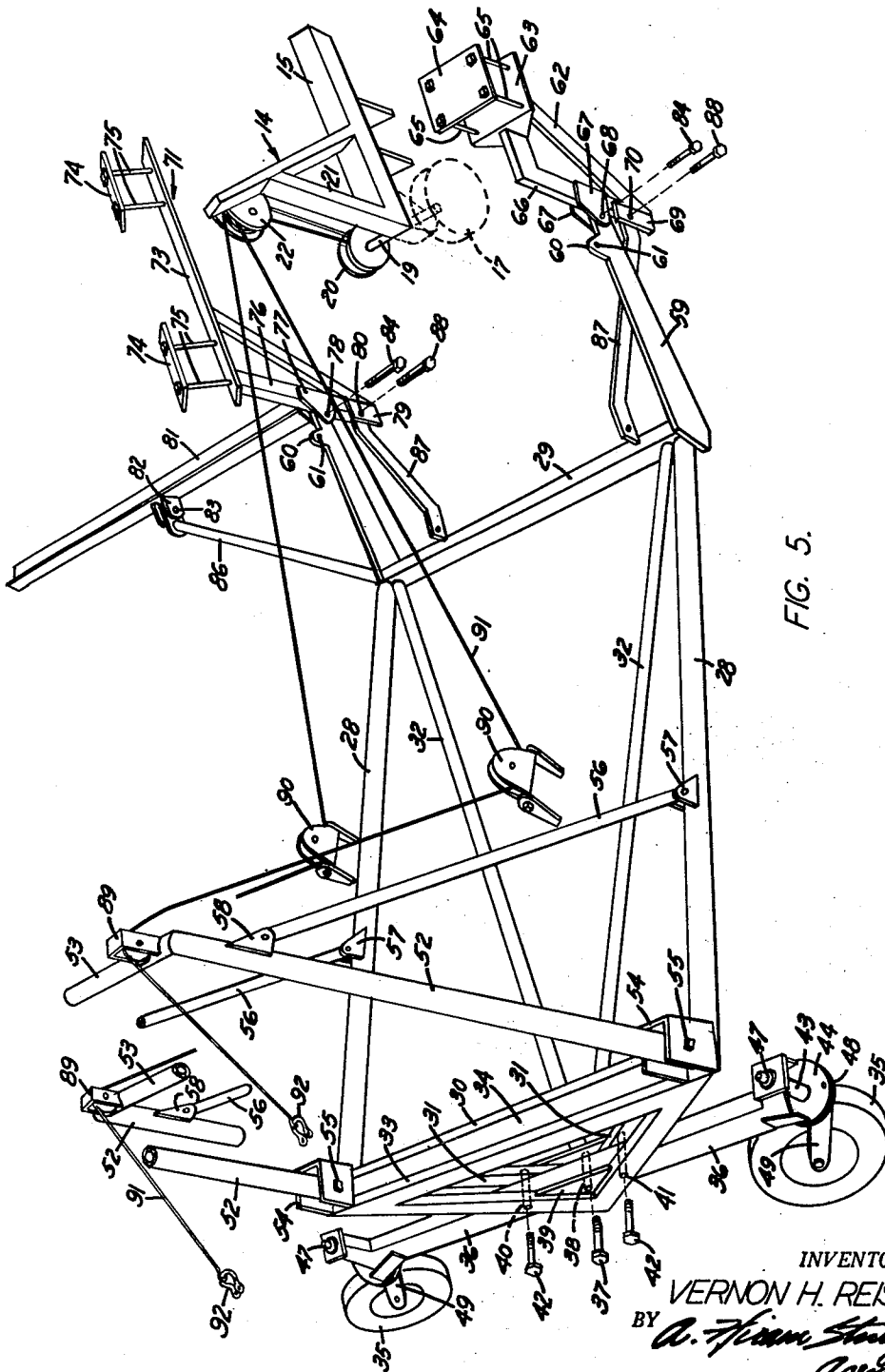


FIG. 5.

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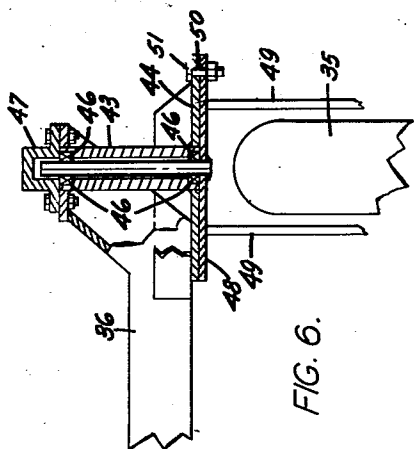
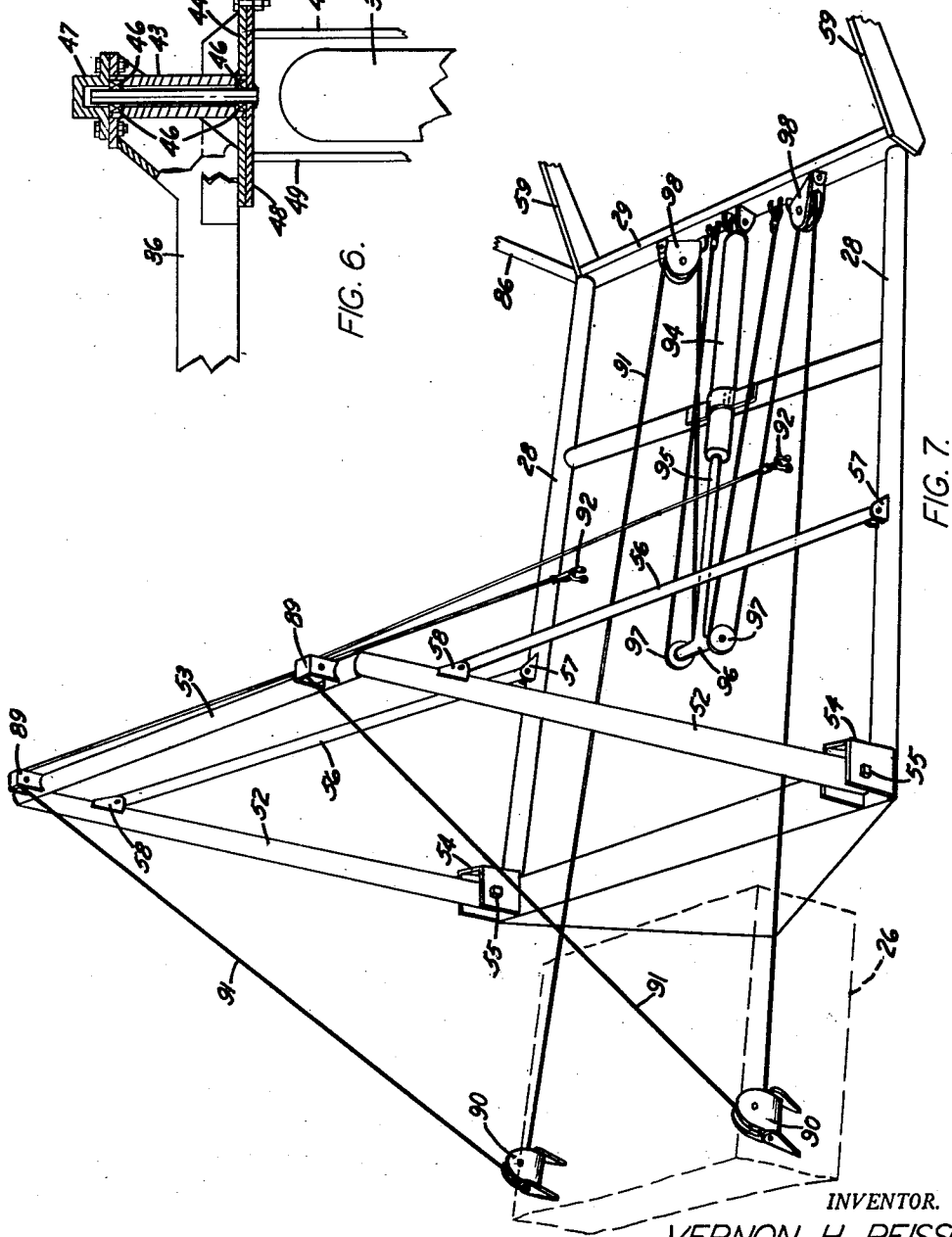
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6 Sheets-Sheet 6



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EXCAVATING MACHINE

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Application July 21, 1955, Serial No. 523,427

3 Claims. (Cl. 37-110)

This invention relates to excavating machinery and more particularly to the type of excavating machinery embodying a motor vehicle having a laterally extending elevating conveyor.

In operation of this type of machinery, excavated soil is deposited on the lower end of the conveyor and is discharged from the upper end of the conveyor. Frequently, this soil is trucked away, and in this case the conveyor discharges the soil into the box of a truck which rides under the elevated end of the conveyor. During this loading operation, it is necessary that the upper end of the conveyor is disposed well above the top of the truck box.

The volume of excavated soil which can be moved per unit of time, substantially proportionately decreases as the angle of elevation of the conveyor is increased. Also, the length of the conveyor is limited by the stability characteristics required for operation of the motor vehicle.

In the past, excavating machinery of the types embodying a motor vehicle having a standard tread and a laterally extending conveyor has not been adapted for operation with large capacity trucks having high boxes. In addition, due to the angle of elevation required for operation of the conveyor with many smaller capacity trucks, the excavating machinery heretofore known has not operated as efficiently as desired.

It has heretofore been thought impossible to provide a practical machine which solves these problems by having a longer conveyor with greater height and a lesser angle of elevation because the machine would tip over, and because stability has been a problem even with the machines now in use. It is the primary object of this invention to provide a way to construct a stable and practical machine having a longer conveyor.

A further object is to provide an excavating machine as described and having a large conveyor of great weight and of greater length than has ever been heretofore mounted on a motor grader of ordinary size and tread, characterized by its ability to travel over rough, steeply inclined, uneven terrain without producing such strains on the machine as would otherwise render it impractical.

And a further object is to provide a motor vehicle mounted excavating machine capable of handling a greater volume of excavated soil per unit of time than has been heretofore possible with conveyors mounted on motor vehicles having a standard tread.

Another object of the present invention is to provide an excavating machine embodying a motor vehicle having a laterally extending elevating conveyor adapted to operate efficiently with substantially any large capacity truck and arranged to handle a greater volume of excavated soil per unit of time than heretofore possible with conveyors used with motor vehicles having a standard tread.

A further object of the present invention is to provide an excavating machine as described above having desirable stability characteristics.

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Still a further object of the present invention is to provide an excavating machine as described above, and including a particularly constructed wheeled carriage and means for interconnecting the motor vehicle, carriage and conveyor, for adjustably supporting the conveyor in any selected elevated position. More particularly, the construction and arrangement is such that the carriage and motor vehicle are relatively movable to accommodate variations in the contour of the ground between the wheels of the carriage and the wheels of the motor vehicle, and the means provide a floating connection for the conveyor whereby the conveyor is automatically raised and lowered with respect to the carriage to compensate for the relative movement of the motor vehicle and carriage during the excavating operation, and whereby the conveyor tends to assume a preset height above the ground below the carriage wheels.

Yet a further object of the present invention is to provide a new and improved carriage which may be easily attached to a motor vehicle in an excavating position for supporting the conveyor as described above, and, in addition, may be easily attached to the motor vehicle in a transport position, wherein the conveyor and carriage are disposed longitudinally behind the motor vehicle and may be conveniently towed thereby.

These and other objects and advantages of the present invention will be apparent from the following description of the invention taken with the accompanying drawings wherein:

Figure 1 is a plan view of the excavating machine of the present invention having the conveyor removed for more clearly illustrating the construction of the wheeled carriage;

Figure 2 is a view in front elevation of the excavating machine of the present invention;

Figure 3 is a view in side elevation looking at the lefthand end of the machine as illustrated in Figure 2 and having the conveyor removed for purposes of illustration;

Figure 4 is a view in side elevation of the carriage and conveyor when arranged in the transport position;

Figure 5 is a perspective view of the carriage and the means for interconnecting the carriage, conveyor and motor vehicle;

Figure 6 is an enlarged view in vertical section taken through the wheel mounting structure of the carriage and illustrating one wheel in the transport position; and

Figure 7 is a perspective view of a portion of the carriage and illustrating the use of hydraulic means for raising and lowering the conveyor.

Referring now to the drawings, the embodiment of the invention there illustrated includes a motor vehicle 10 which, for the purposes of illustration, is shown as the well known Adams motor grader, model 550, to which further reference may be had for structural details.

In the past this type of motor grader has been adapted for use with a laterally extending elevator conveyor and an excavating disc. In operation of this machine, the disc deposited excavated soil onto the lower end of the conveyor which then discharged the soil from its elevated end onto the ground or into the box of a truck, as previously noted.

In the drawings, the disc 11 is disposed between the front axle 12 and the intermediate axle 13 of the motor grader and is arranged outwardly from the lefthand side of the frame of the grader, as viewed in Figure 1. Also, the disc 11 is mounted to the frame by any suitable means whereby the disc may be adjustably positioned and operated, in the well known manner, from controls carried by the motor grader. For a further description regarding the disc and associated mounting means, reference

may be had to the "Elegrader excavating machine" produced by the Reisser Corporation of Blair, Nebraska. Also, the lower end of the conveyor was pivotally mounted to the frame of the grader so that the lower end of the conveyor was disposed closely adjacent to the disc. The upper end of the conveyor was supported in an elevated position by a pair of cables which were tied to the conveyor and to a driven pulley carried by a gantry which was mounted to the frame of the grader.

In the drawings, the gantry 14 is illustrated as including a laterally extending cross arm 15 which is mounted intermediate its ends to the single frame member 16 of the grader 10. The ends of this arm carry a pair of gear boxes 17 and 18. The gears in the box 17 are operatively connected to a rearwardly extending shaft 19 which is received through a suitable bearing carried by the underside of the cross arm 15. The rearward end of the shaft is connected to a double drive pulley 20. Also, the righthand end of the cross arm 15 fixedly carries a braced upstanding arm 21, and the upper end of this arm carries a double pulley 22 which is disposed directly above the drive pulley and is arranged to rotate about an axis which is substantially parallel to the axis of rotation of the drive pulley 20.

The means for pivotally mounting the lower end of the conveyor to the frame are broadly illustrated in the drawings by a fixture which is rigidly connected to the frame and includes a rotatably mounted shaft 23. The shaft 23 is provided with two spaced apart arms 24 which are fixedly connected at their upper ends to the shaft and have lower ends to which are attached a pair of downwardly extending chains 25. The arms 24 are swingable about a substantially longitudinally extending axis and the lower ends of the chains are adapted to be releasably attached to the lower end of the conveyor 26 whereby the lower end of the conveyor may be selectively raised and lowered. A gear box which is a part of the motor grader actuates an arm and link. This link is attached to arm 24 which rotates shaft 23 for selectively raising and lowering the grader. Also, the gears in the gear boxes 17 and 18 may be operatively driven from a power take-off of the grader 10 in the well known manner, and are preferably controlled by mechanism disposed within convenient reach of an operator of the motor grader. Further information as to the construction of the gantry 14 and the means for pivotally mounting the lower end of the conveyor 26 may be had by reference to the "Elegrader excavating machine."

Now, as previously noted, the volume of excavated soil which can be moved by a conveyor per unit of time, substantially proportionally decreases as the angle of elevation of the conveyor is increased. Also, the physical condition of the excavated soil determines the maximum angle of elevation at which the conveyor can operate efficiently.

Heretofore, the lengths of the conveyors adapted for use with motor vehicles having a standard tread have not been sufficient to accommodate their use with large capacity trucks having high boxes. Moreover, these conveyors have not proven adaptable for use over a wide range of soil conditions with many trucks having lower boxes. In the past, it has been substantially impossible to lengthen these conveyors without dangerously reducing the stability characteristics required for operation of the standard tread motor vehicle.

By increasing the length of the conveyor it is possible to reduce the angle of elevation of the conveyor to maintain a good operating efficiency and still elevate the outer end of the conveyor a sufficient height above the ground to accommodate its use with large capacity trucks having high boxes.

The present invention provides a particularly constructed carriage 27 adapted for use with a standard tread motor vehicle 10, and a laterally extending elevating conveyor 26, whereby the conveyor may be substantially

lengthened without reducing the desired stability characteristics of the motor vehicle. In addition to the advantages resulting from the use of a longer conveyor, the construction provides other advantages which are subsequently more fully described.

As shown in Figure 5, the carriage 27 comprises a rigid frame which includes a pair of laterally spaced-apart and parallel frame members 28 which are connected at their inner ends by a crossbrace 29 and are connected at their outer ends to the upper member 30 of a first triangular plate. This upper member is disposed substantially parallel to the crossbrace 29, and has a pair of downwardly extending side members 31 which converge at a point arranged centrally below the upper member 30. The structure is strengthened by a pair of braces 32 which are attached to the lower ends of the side members 31 and extend divergently inwardly and upwardly and are respectively connected to the opposite end portions of the crossbrace 29. A second similarly constructed triangular plate is disposed in an outwardly spaced face-to-face relation with respect to the first plate, and the top member 33 of the second plate is rigidly connected to the top member 30 of the first plate by a rectangular spaced plate 34.

In operation of the excavating machine, the carriage 27 is pivotally connected to the righthand side of the motor grader 10, as subsequently described, and extends laterally outwardly therefrom in a direction transverse to the direction of travel of the motor grader, as shown in Figure 1. The outer end of the carriage is supported by a pair of wheels 35 which are carried by a bar 36 which is adapted to rock for accommodating variations in the contour of the ground. Also, the wheels 35 are arranged in tandem and are each swingable about a respective upstanding axis whereby the wheels can freely turn to follow any change in the direction of travel of the motor grader 10.

The rocker bar 36 is pivotally mounted to the carriage by a bolt 37 which is received through a hole in the center of the bar and through a pair of axially aligned holes 38 in a pair of plates 39 which are welded or otherwise secured in the inner lower apices of the first and second triangular plates. Also, the rocker bar 36 is provided with a bolt receiving hole 40 spaced on either side of the hole in the center of the bar. The lower portions of the members are provided with pairs of axially aligned holes 41 which are adapted to register with the holes 40 when the rocker bar is disposed in a substantially horizontal position, whereby the bar may be locked in this position by a pair of bolts 42 received through the registering openings 40 and 41.

The bar 36 is provided with a length whereby its ends extend outwardly beyond the frame members 28. Each outer end of the bar is provided with an upstanding portion which includes an internal depending cylindrical housing 43 (Figure 6). The lower portion of each housing 43 is rigidly connected to a disc 44 through an opening in the center thereof, and an edge portion of each disc 44 is welded or otherwise secured to the underside of the adjacent end of the bar 36. Each wheel 35 is pivotally mounted to the bar 36 by a shaft 45 which is disposed in a respective one of the housings 43 and is rotatably received by suitable bearings 46 in the housing and a cap 47 is bolted over the housing. The lower end of each shaft is fixedly connected to the center portion of another disc 48, and depending from each disc 48 is a fork 49, the lower ends of which receive the axles of a respective one of the wheels 35. Also, each pair of discs 44 and 48 is provided with a pair of holes 50 which are arranged to register when the axles of the wheels are axially aligned whereby the wheels 35 may be locked into this position by a bolt 51 received through each pair of registered openings 50.

Further, the carriage comprises an end frame including a pair of laterally spaced-apart upstanding booms

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52 which are rigidly connected at their upper ends by a crossbrace 53. The lower ends of the booms are received in a pair of housings 54 which are fixed to the opposite ends of the top members 30 and 33. Each of the housings 54 is provided with a pair of laterally spaced-apart sides having a pair of axially aligned holes, and each of the booms is provided with a through hole whereby they may be pivotally mounted to the housings 54 by a pair of bolts 55 received through the openings in the booms and housing sides. Also, the housings are provided with back walls which are spaced to accommodate the swinging movement of the booms 52 between an upstanding position, as illustrated in Figure 2, and a depressed position, as illustrated in Figure 4. The end frame is retained in the upstanding position by a pair of braces 56. The lower ends of the braces are releasably bolted to pairs of ears 57 carried by the frame members 28, and the upper ends of the braces are releasably bolted to pairs of ears 58 carried by the booms.

As previously noted, the carriage 27 is releasably attached to the righthand side of the grader 10, as viewed in Figure 1. To this end, the inner end of the carriage is provided with a pair of laterally spaced-apart and parallel plates 59. The outer ends of these plates are welded to the respective outer ends of the crossbrace 29 and extend toward the grader and slightly upwardly with respect to the frame members 28. Each of the plates 59 is provided with an upstanding ear 60 having a bolt receiving hole 61 therethrough, and the inner ends of the plates are provided with a pair of axially aligned holes.

The inner ends of the plates 59 are pivotally and releasably attached to a pair of brackets which are carried by the frame of the motor grader. Disposed forwardly of the gantry 14 is a triangular bracket 62 which is attached to the single frame member 16 of the grader by a lower plate 63, an upper plate 64, and a number of interconnecting bolts 65. This bracket includes a downwardly extending member 66 disposed on the righthand side of the grader, as viewed in Figure 1. This member is provided with a pair of spaced-apart ears 67 having a pair of axially aligned bolt receiving holes 68. Arranged below the pair of ears 67 is a third ear 69 which also has a bolt receiving hole 70.

Disposed rearwardly of the gantry 14 is another triangular bracket 71 which is attached to the forked frame members 72 of the grader by a laterally extending lower plate 73, and a pair of laterally spaced-apart upper plates 74. Each of these upper plates is connected to the frame members and the lower plate by pairs of bolts 75. This bracket 71 also includes a downwardly extending member 76 provided with a pair of spaced-apart ears 77 each having a bolt receiving hole 78 axially aligned with the holes 68 in the ears 67. Also, a third ear 79 is arranged below the ears 77 and is provided with a bolt receiving hole 80 which is axially aligned with the hole 70. Extending rearwardly from the bracket 71 is a bar 81 which is fixed at its front end to the bracket member 76, and is bolted or otherwise fixed at its rear end to the frame of the motor grader. This bar is also provided with a pair of spaced-apart ears 82 having a pair of bolt receiving holes 83 which are axially aligned with the holes 68 and 78.

The inner ends of the plates 59 are received between the respective pairs of ears 67 and 77, whereby the carriage is pivotally mounted to the frame of the motor grader by a pair of bolts 84 received through the respective openings in the plates and ears. Also, the lefthand plate 59, as viewed in Figure 1, is provided with a pair of vertically spaced-apart apertured ears 85. These ears are adapted to receive the apertured outer end of a push bar 86 which is connected to the ears 85 by a bolt. The inner end of the push bar extends inwardly and rearwardly and is received between the ears 82. This inner end is also apertured and is pivotally connected

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to the ears by a bolt. From the foregoing it may be seen that the carriage 27 is mounted to pivot about a single axis which extends longitudinally with respect to the motor grader 10. Thus the carriage and motor grader are relatively movable to accommodate the variations in ground contour between the wheels of the carriage and the wheels of the motor grader.

The conveyor 26 is a conventional endless belt type conveyor which, as previously noted, is provided with a length which is substantially greater than the conveyors heretofore used with standard tread motor vehicles. As shown in Figure 2, the conveyor extends outwardly from the motor grader in a direction transverse to the direction of travel of the grader.

The inner end of the conveyor 26 is disposed beneath the frame of the grader and is releasably connected to the lower end of the chains 25 whereby it may be given the desired vertical adjustment with respect to the ground. Also, the lower end of the conveyor is prevented from engaging the disc 11 by a pair of radius bars 87. The outer ends of these bars are pivotally connected to the opposite sides of the conveyor 26, and the inner ends of the bars are provided with a pair of axially aligned holes which are adapted to register with the holes 70 and 80 in the ears 69 and 79 whereby the radius bars are releasably attached to the ears by a pair of bolts 88. The outer end portions of the conveyor 26 extend between the booms 52 of the carriage, and the outer end of the conveyor is disposed well outwardly from the carriage. The endless belt of the conveyor 26 may be driven from a power take-off of the motor by any suitable means as by the use of a flexible shaft releasably interconnected between the power take-off and the drive roller of the conveyor belt. Further information as to such an arrangement may be had by referring to the "Elegrader excavating machine," as previously noted.

Further, the invention comprises means for interconnecting the motor vehicle 10, carriage 27, and conveyor 26 for adjustably supporting the conveyor in any selected elevated position. As shown in Figures 1 and 2, a pair of axially aligned pulleys 89 are carried on the top of the crossbrace 53 of the end frame. These pulleys are arranged adjacent to the ends of the crossbrace. Also, a pair of axially aligned pulleys 90 are carried by the sides of the conveyor and are arranged a slight distance inwardly with respect to the booms 52, as shown in Figure 2. A pair of cables 91 are tied to the drive pulley 20 and are reeved around the double pulley 22, and around the conveyor pulleys 90 and end frame pulleys 89. The outer ends of the cables 91 are tied to a pair of clevises 92 which are pinned to the opposite sides of the conveyor 26 at a pair of laterally aligned points which are disposed between the outer end of the conveyor and the end frame.

From the foregoing description, it may be seen that the carriage 27 is pivotally mounted to the frame of the motor grader and is arranged to swing about an axis which is fixed with respect to the frame of the grader. The conveyor 26, on the other hand, is not mounted to swing about a fixed axis, and may be bodily raised or lowered by joint operation of the drive pulley and the arm. Also, either end of the conveyor may be raised or lowered with respect to the other end of the conveyor by individually operating the drive pulley 20 or arm 24. Moreover, since the inner and outer ends of the cables 91 are tied to the motor grader 10 and conveyor 26, respectively, the conveyor and carriage are also relatively movable.

Thus, in operation of the excavating machine with a truck, the outer end of the conveyor may be set at a predetermined height above the ground below the carriage wheels 35, and a sufficient distance above the top of the truck box by operation of the drive pulley 20 and arm 24. The disc 11 is then set to take the desired cut and the endless conveyor belt is set in operation. As

the motor grader is driven forwardly or toward the right, as viewed in Figure 3, the disc deposits excavated soil onto the lower end of the conveyor 26. This soil is then elevated by the conveyor and discharged from the elevated end thereof into the truck box.

During the excavating operation, the elevated end of the conveyor floats with respect to the carriage 27 and motor grader 10, and tends to assume its preset angle of elevation and height above the ground below the carriage wheels 35. Since the level of the ground below the carriage wheels is generally the same as that below the wheels of the truck, the elevated end of the carriage also automatically tends to assume its preset height above the box of the truck.

More particularly, due to the relatively movable and interconnected relationship between the carriage 27, conveyor 26, and motor grader 10, the arrangement is such that if the motor grader wheels ride higher than the carriage wheels, the conveyor will automatically rise with respect to the carriage to substantially offset any downward movement of the outer end of the conveyor as a result of the upward movement of the inner end of the conveyor. Conversely, if the motor grader wheels ride lower than the carriage wheels, the conveyor will automatically be lowered with respect to the carriage to substantially offset any upward movement of the outer end of the conveyor as a result of the downward movement of the inner end of the conveyor. Thus, the elevated end of the conveyor tends to assume a predetermined height, and maintain a preset angle of elevation during the excavating operation. This is a highly advantageous feature of the present invention and is believed to be new in the art.

As previously noted, the conveyor 26 is provided with a length which is substantially greater than the lengths of conveyors heretofore used with standard tread vehicles. Moreover, this is accomplished by the present invention without reducing the desired stability characteristics of the motor grader. The extended length of the conveyor accommodates its use over a wide range of soil conditions. In addition, the outer end of the conveyor may be elevated for efficient use with large capacity trucks having high boxes while maintaining the conveyor at a smaller angle of elevation than heretofore possible. As thus described it will be seen that the cable and pulley system form an automatic compensating means attached to and interconnecting the conveyor and the conveyor supporting carriage for causing the carriage to support a substantial portion of the weight of the conveyor and for automatically causing vertical movement of the conveyor with respect to the carriage to automatically cause that part of said conveyor which is directly above the carriage to move a substantially lesser distance upwardly or downwardly than the carriage moves upwardly or downwardly, respectively, responsive to each variation in ground level over which the carriage wheels pass.

It will further be seen that the cable and pulley system form one type of a controllable means together with the controllable pulleys 22 of the gantry 14 which means interconnects the conveyor and the carriage for supporting the outer end portion of the conveyor and for causing the carriage to support a substantial portion of the weight of the conveyor and for causing vertical movement of the conveyor with respect to the carriage to make it possible to prevent that part of the conveyor which is directly above the carriage from moving upwardly or downwardly as great a distance as the carriage moves upwardly or downwardly respectively responsive to each variation in the ground level over which the carriage wheels pass.

Finally, the construction of the present invention is such that the carriage 27 and conveyor 26 may be easily disconnected from the laterally extending excavating position, as shown in Figure 2, and moved into a transport

position behind the motor grader. Thus the excavating machine comprises a mobile unit which may be driven along standard width highways between excavating jobs.

More particularly, the rocker bar 36 is locked into a fixed horizontal position by the pair of bolts 42 which are inserted through the holes 41 and 40 in the members and the registering holes in the bar. The drive pulley 20 is then operated to lower the conveyor 26 onto the top members 30 and 33 and the crossbrace 29, and the cables 91 are disconnected from the drive pulley. The lower ends of the braces 56 are then disconnected from the ears 57, and the end frame is swung into the depressed position, as shown in Figure 4. The radius bars 87 are disconnected from the ears 69 and 79, and are swung upwardly until the holes in their inner ends are in registry with the respective holes 61 in the ears 60. The ends of the radius bars 87 are then bolted to the ears 60 whereby the conveyor is fixed against longitudinal movement of the carriage. The lower end of the conveyor is then disconnected from the chains 25 and the push bar 86 is disconnected from the conveyor and motor grader frame. The plates 59 are disconnected from the grader frame, and the conveyor and carriage are moved into a transport position and disposed longitudinally behind the motor grader. The inner end of the conveyor is then connected to the rear end of the motor grader by a conventional trailer hitch 93. Finally, the carriage wheels 35 are pivoted to a trailing position as illustrated in Figure 4 and are fixed in this position by a locking pin whereby the excavating machine is ready to be driven to the next work location where the conveyor and carriage can be easily reattached in the excavating position.

Figure 7 illustrates an arrangement whereby the conveyor 26 may be raised and lowered by operation of an expansion-contraction type hydraulic motor and a pulley and cable arrangement carried by the carriage.

The inner end of the cylinder 94 of the motor is fixed to the crossbrace 29 intermediate the ends thereof. The piston rod 95 of the motor extends outwardly between the frame members 28 and carries a crossarm 96 having a pair of axially aligned pulleys 97. A pair of pulleys 98 are also carried by the crossbrace 29, one of the pulleys being disposed on either side of the cylinder. The cable connections on the conveyor are reversed with respect to the arrangement as illustrated in Figure 5. The pulleys 90 are now disposed on either side of the conveyor 26 and on the outer end portion of the conveyor with respect to the booms 52. The clevises 92 are disposed on either side of the conveyor and on the inner end portion of the conveyor with respect to the booms 52. The inner ends of the two cables 91 are tied to the crossbrace 29 on either side of the cylinder and between the pulleys 98. The cables 91 are then reeved around the piston rod pulleys 97, through the crossbrace pulleys 98, and thence extend outwardly and are reeved around the conveyor pulleys 90 and end frame pulleys 89 and are tied to the clevises 92.

The hydraulic motor may be operated by any suitable controls carried by the motor grader. Thus, as shown in Figure 7, when the hydraulic motor is expanded, the outer end of the conveyor 26 is raised, and when the hydraulic motor is contracted, the outer end of the conveyor 26 is lowered.

The foregoing description has been given for clearness of understanding only, and no unnecessary limitations should be implied therefrom, for it will be apparent to those skilled in the art that variations and changes may be made in the construction of the present invention without departing from the spirit and scope of the appended claims.

I claim:

1. An excavating machine comprising: a motor vehicle, a conveyor extending laterally from one side of said vehicle and disposed transversely with respect to the direction of travel of said vehicle, a carriage having an outer end including a pair of wheels disposed laterally out-

wardly from said one side of said vehicle and adapted to ride on the ground below said conveyor and in the direction of travel of said vehicle, said carriage having an inner end pivotally connected to said vehicle whereby the outer end of said carriage is adapted to swing in an arc transverse to the direction of travel of said vehicle, said outer end of said carriage having a pair of laterally spaced-apart upstanding booms, said conveyor extending between said booms and having an outer end portion disposed well outwardly from said booms and an inner end pivotally connected to said vehicle, a first pulley mounted on an upper end of one of said booms, a second pulley mounted to said conveyor between said booms and said motor vehicle, a cable reeved under said second pulley and over said first pulley and having an inner end secured to said motor vehicle and an outer end secured to said outer end portion of said conveyor whereby said carriage is caused to support a substantial portion of the weight of said conveyor and whereby vertical movement of said conveyor with respect to said carriage is automatically caused so that the part of said conveyor which is directly above said carriage moves a substantially lesser distance upwardly or downwardly than the carriage moves upwardly and downwardly respectively responsive to each variation in ground level over which the carriage wheels pass, and means for depositing excavated soil onto the inner end of said conveyor.

2. The construction as set forth in claim 1 wherein said inner end of said cable is secured to a drive pulley carried by the motor vehicle and disposed above said inner ends of said carriage and said conveyor.

3. An excavating machine comprising: a motor vehicle, a conveyor extending laterally from one side of said vehicle and disposed transversely with respect to the direction of travel of said vehicle, a carriage disposed beneath said conveyor on said one side of said vehicle and having an outer end including a pair of wheels disposed laterally outwardly from said one side of said vehicle and adapted to ride on the ground below said conveyor and in the direction of travel of said vehicle, said carriage having a rigid frame having an inner end adapted to be pivotally connected to one side of the motor vehicle and having an outer end adapted to be disposed below the conveyor, re-

leasable means for pivotally connecting said carriage to said vehicle whereby the outer end of said carriage is adapted to swing in an arc transverse to the direction of travel of said vehicle, said outer end of the rigid frame having a downwardly extending member, a bar pivotally mounted intermediate its ends to said downwardly extending member and adapted to rock about a horizontal axis disposed transverse to the direction of travel of the motor vehicle, a pair of caster wheels carried in tandem by the ends of said bar and adapted to engage the ground for supporting said outer end of said frame, said caster wheels being disposed respectively extending at least partially forwardly of said conveyor and at least partially rearwardly of said conveyor whereby said wheels are spaced apart a considerable distance for stability when the conveyor and carriage are in a trailer position, releasable means for locking said bar to said carriage to prevent said rocking when said conveyor and carriage are in a trailing position, releasable means for holding said caster wheels in positions transverse to said bar when said conveyor and carriage are in trailing positions, and means for interconnecting said carriage and said conveyor whereby outer end of said conveyor is supported by said carriage, and means for disconnectably attaching the inner end of said conveyor to said motor vehicle during excavating and for removal of said conveyor and carriage from the excavating position of attachment to said motor vehicle whereby the normally inner end of said conveyor can be attached to said motor vehicle in towing position for the towing of the conveyor and carriage on said carriage wheels in trailer fashion, and means for depositing excavated soil onto the inner end of said conveyor.

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