

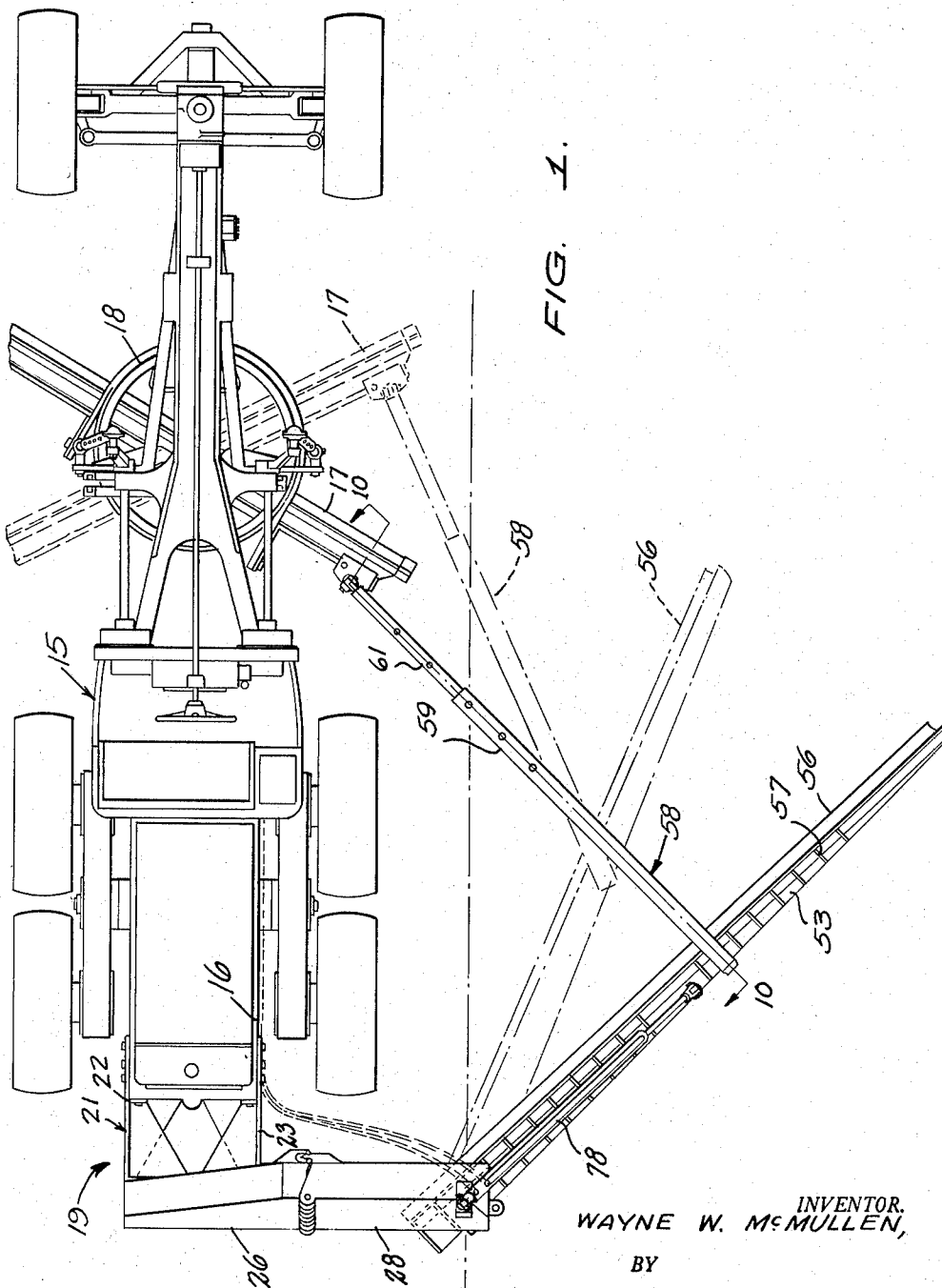
Aug. 19, 1958

W. W. McMULLEN
SLOPE GRADER ATTACHMENT

2,847,772

Filed Feb. 28, 1956

6 Sheets-Sheet 1



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SLOPE GRADER ATTACHMENT

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6 Sheets-Sheet 2

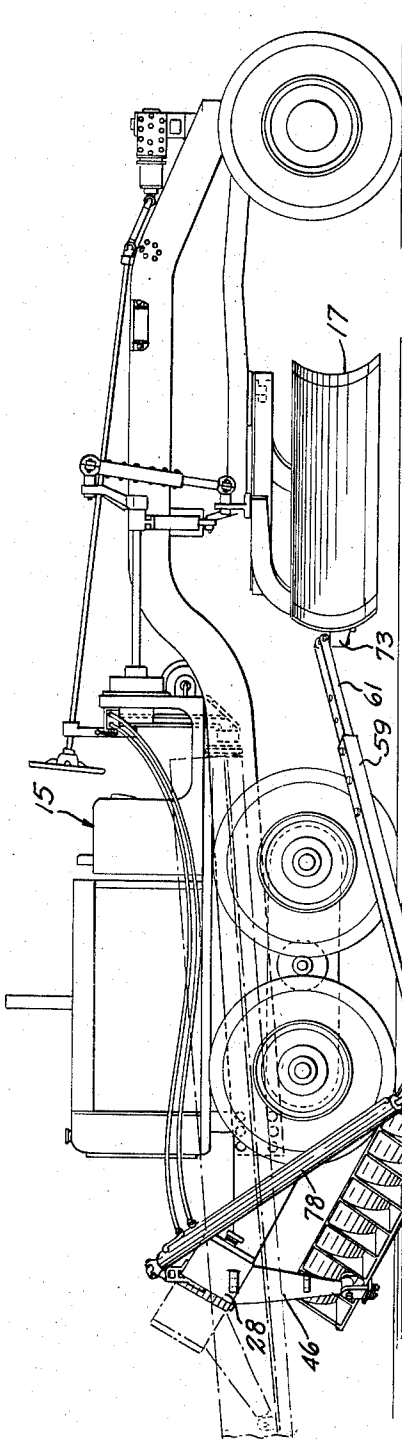


FIG. 2.

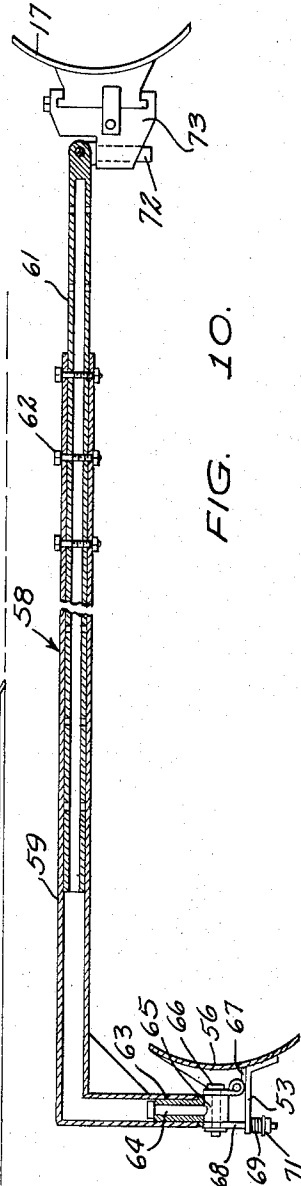


FIG. 10.

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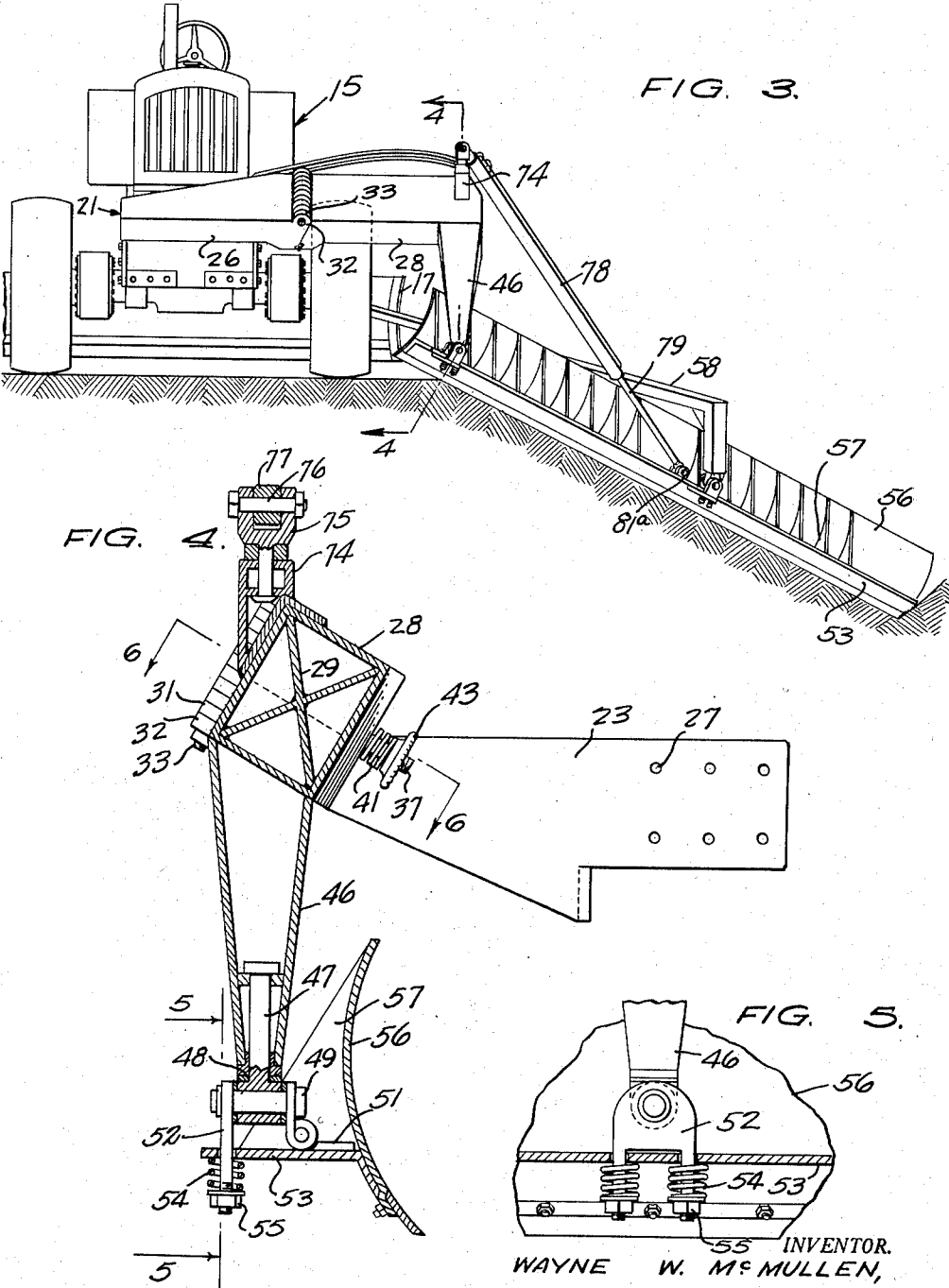
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6 Sheets-Sheet 3



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6 Sheets-Sheet 4

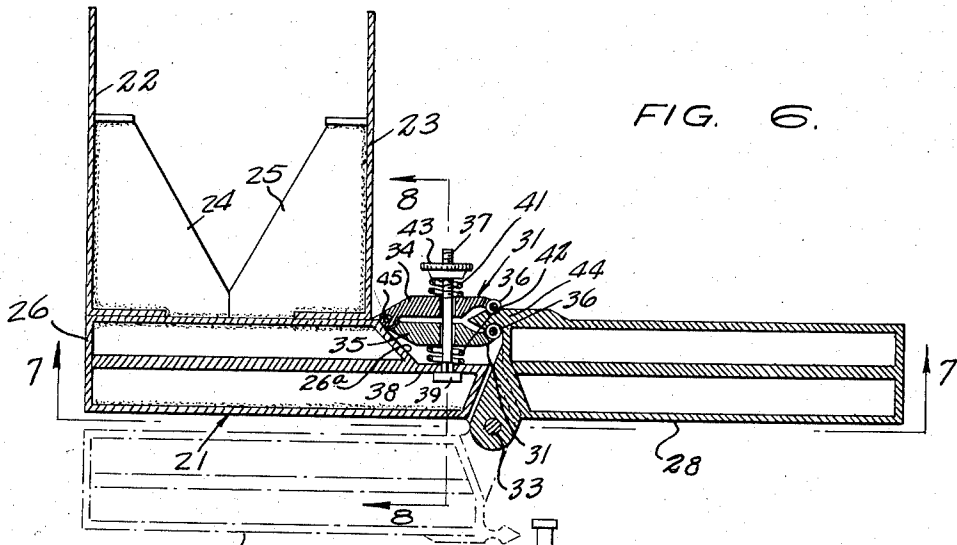


FIG. 6.

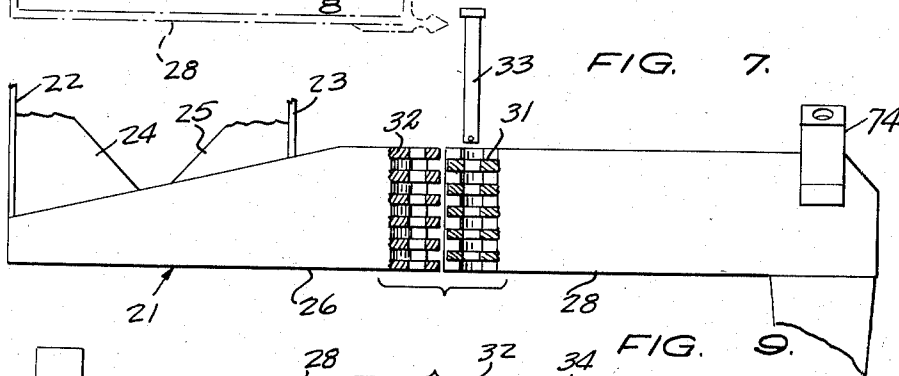


FIG. 7.

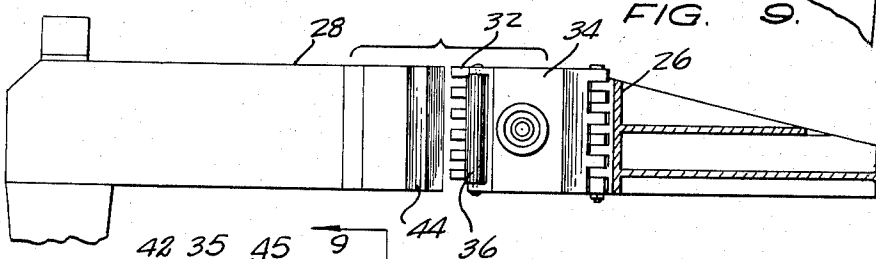


FIG. 9.

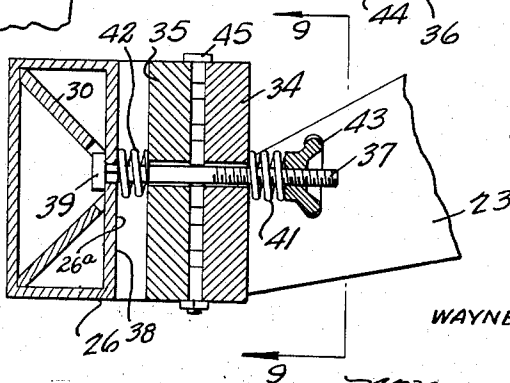


FIG. 8.

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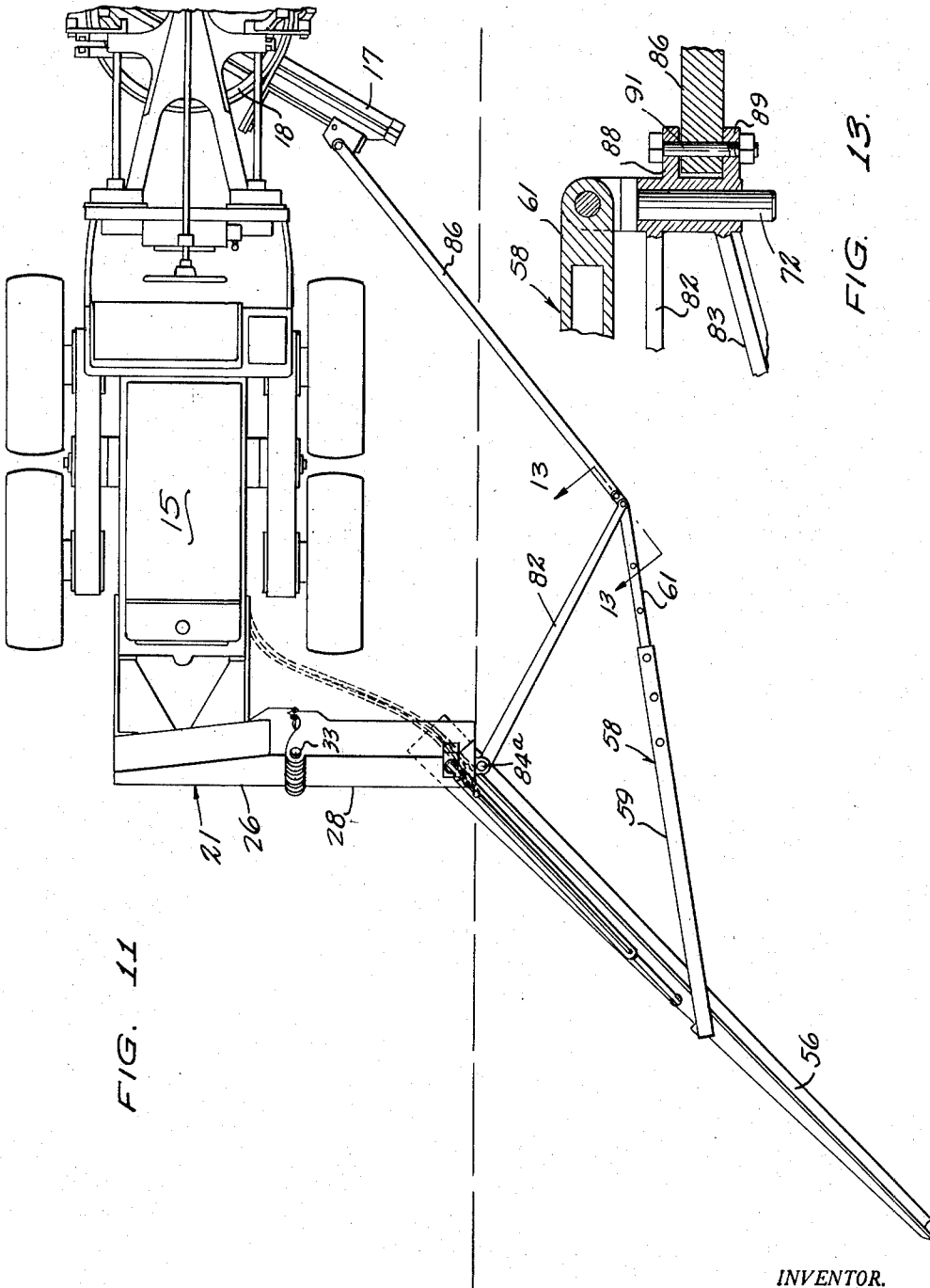
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6 Sheets-Sheet 5



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SLOPE GRADER ATTACHMENT

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Application February 28, 1956, Serial No. 568,331

7 Claims. (Cl. 37—155)

The present invention relates generally to road graders, and in particular to a slope grader for attachment to a road grader.

An object of the present invention is to provide a slope grader attachment for a road grader which enables the operator of the road grader to shape the sloping sides of the road surfaces and irrigation ditches by scraping the dirt and gravel and by moving the loosened dirt and gravel either upwardly or downwardly toward or away from the crown of the road.

Another object of the present invention is to provide a slope grader attachment for a road grader which enables an operator to clean the ditches on either side of the road surface, one which has automatically operable release means to protect the blade thereof from damage by boulders or other obstructions, one which may be permanently attached to a road grader and swung up out of the way when not in use, one which is simple in structure, sturdily constructed, and economically feasible.

These and other objects and advantages of the present invention will be fully apparent from the following description when taken in connection with the annexed drawings, in which:

Figure 1 is a plan view of a road grader with the slope grader of the present invention attached thereto, the dotted line showing indicating the movement of the deflecting blade of the slope grader forwardly upon swinging movement of the leveling blade of the road grader,

Figure 2 is a side elevational view of the assembly of Figure 1,

Figure 3 is a rear elevational view of the assembly of Figure 1,

Figure 4 is a sectional view, on an enlarged scale, taken on the line 4—4 of Figure 3,

Figure 5 is a sectional view taken on the line 5—5 of Figure 4,

Figure 6 is a sectional view taken on the line 6—6 of Figure 4, the dotted line showing indicating the released position of the support for the deflecting blade,

Figure 7 is a view taken on the line 7—7 of Figure 6,

Figure 8 is a sectional view, on an enlarged scale, taken on the line 8—8 of Figure 6,

Figure 9 is a view, partially in section and on a reduced scale, taken on the line 9—9 of Figure 8,

Figure 10 is a sectional view, on an enlarged scale, taken on the line 10—10 of Figure 1,

Figure 11 is a plan view of the road grader of Figure 1 with the slope grader of the present invention attached thereto and showing a strut means for supporting the bar member which connects the deflecting blade to the leveling blade,

Figure 12 is a side elevational view of the assembly of Figure 11,

Figure 13 is a sectional view, on an enlarged scale, taken on the line 13—13 of Figure 11, and

Figure 14 is an exploded view of the strut means of Figures 11 and 12.

Referring in greater detail to the drawings, in which like numerals indicate like parts throughout the several views, the slope grader attachment of the present invention is for use with a road grader designated generally by the reference numeral 15, the grader 15 having a wheeled frame 16 with a forward end and a rearward end. The road grader 15 has a leveling blade 17 positioned beneath the frame 16 intermediate the ends of the latter so that it extends in a direction crosswise of the frame 16 with one of its ends near the forward end of the frame 16 and the other of its ends near the rearward end of the frame 16. The leveling blade 17 is dependently supported from a horizontally disposed ring or wheel 18 which connects it to the frame 16 for movement about the wheel 18 as an axis from the position in which one of its ends is near the forward end of the frame 16 and the other of its ends is near the rearward end of the frame 16 to a position in which the first-named end is near the rearward end of the frame 16 and the last-named end is near the forward end of frame 16.

The slope grader attachment of the present invention is designated generally by the reference numeral 19 and comprises a bracket 21 positioned behind the rearward end of the frame 16 and fixedly secured to the frame 16. In Figures 4, 6 and 8 the bracket 21 is shown in detail and consists in a pair of side plates 22 and 23 connected together along a portion of their lower edges by web plates 24 and 25. The side plates 22 and 23 are of L-shaped cross sectional configuration and have their short legs welded or otherwise secured to the forward side of a horizontally disposed anchoring element 26 which is parallel to the rearward end of the frame 16. The element 26 is in the form of a box structure and is arranged so that it slopes upwardly toward the forward end of the frame 16 at about an angle of 60° to the horizontal. The side plates 22 and 23 are provided with bolt holes as at 27 in Figure 4 for fixedly attaching the side plates 22 and 23 to the tractor frame 16 adjacent the rear end of the latter.

A horizontally disposed support 28 is positioned in confronting end to end aligned relation with respect to the anchoring element 26 and is connected at the confronting end to the anchoring element 26 for movement of the support from the end to end aligned position to a position in which the support is in back to back position with respect to said anchoring element. The support 28 is of a box-like structure similar to the box structure 26 of the bracket 21 and has reinforcing webs 29 within it similar to the reinforcing webs 30 within the box structure 26. As seen in Figure 4, the support 28 is arranged so that it slopes upwardly toward the forward end of the frame 16 at about an angle of 60° to the horizontal. As seen in Figures 6 and 7, the confronting ends of the support 28 and the box structure 26 of the bracket 21 are provided with interlocking and projecting lugs 31 and 32, respectively, and a hinge pin 33 extends through the aligned apertures provided in the lugs 31 and 32 and permits the swinging movement of the support 28 from the end to end aligned position to a position in which the support 28 is in back to back position with respect to the anchoring element 26.

Spring means is provided operatively connected to the bracket 21 for retaining the support 28 in the end to end aligned position with respect to the anchoring element 26. Specifically, the spring means consists in a pair of up-standing plates 34 and 35 arranged in face to face spaced relation and having their one ends pivotally connected to the box structure 26 of the bracket 21 inwardly of the end which is adjacent the support 28. The box structure 26 is provided with a cut-away portion 26a at this point so that the plates 34 and 35 are partially received therein. The other ends of the plates 34 and 35 are each provided

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with a roller 36. A bolt 37 extends through aligned apertures in the plates 34 and 35 and through the adjacent wall 38 of the box structure 26. The head 39 of the bolt 37 abuts against the wall 38 of the box structure 26 and a pair of coil springs 41 and 42 surround the portions of the bolt 37 which are exteriorly of the plates 34 and 35, respectively. A knurled nut 43 on the free end portion of the bolt 37 provides the means for compressing the springs 41 and 42 so that the plates 34 and 35 are held in their face to face spaced position. A projecting flange 44 on the adjacent end of the support 28 is provided with a recess on each side receiving the rollers 36 when the support 28 is in the end to end alignment position. Upon movement from the end to end alignment position to the back to back position, the free end of the flange 44 will move from between the rollers 36. The resiliency of the springs 41 and 42 maintain the support 28 in the end to end alignment position and prevent the movement of the flange 44 from between the rollers 36. A hinge pin 45 connects the plates 34 and 35 together for movement from the face to face position to a position at which the flange 44 may be released from the engagement with the rollers 36.

At the end of the support 28 remote from the hinge pin 33 is dependently secured a hanger 46 having four walls and tapering from its upper end to its lower end and fixedly secured by welding or other means to the lower face of the support 28. In Figure 4 and in Figure 5 it will be seen that the lower end of the hanger 46 supports the stem 47 of a T-shaped coupling member 48. The T-shaped coupling member 48 has a horizontally disposed bore therethrough in which is received a pivot pin 49 which has its head abutting against one leaf of a leaf spring 51. A support member 52 is carried on the other end of the pin 49 and has its bifurcated lower end extending through apertures in a horizontally disposed plate 53. Springs 54 interposed beneath the under-surface of the plate 53 and nuts 55 carried upon each of the legs of the support member 52 serve as the means of resiliently connecting the plate 53 to the coupling member 48.

An upstanding deflecting blade 56 is positioned outwardly of the other side of the support 28 so that it extends in a downwardly sloping direction away from the support 28 and is connected adjacent the one end to the non-confronting end of the support 28 for upward and downward movement about a horizontal axis and for rotary movement about a vertical axis. The pivot pin 49 constitutes the means by which the deflecting blade 56 is connected to the support 28 for movement about a horizontal axis and the stem 47 of the coupling member 48 constitutes the means by which the blade 56 is connected to the hanger 46, and thusly to the support 28, for rotary movement about a vertical axis. The deflecting blade 56 is welded to the plate 53 and has reinforcing webs 57 extending from its rear face to the upper face of the plate 53.

Means is provided connecting the deflecting blade 56 to the leveling blade 17 of the road grader 15 so that movement of the leveling blade 17 from the position in which one of its ends is near the forward end of the frame 16 and the other of its ends is near the rearward end of the frame 16 to the position in which the first-named end of the leveling blade is near the rearward end of the frame 16 and the last-named end of the leveling blade is near the forward end of the frame 16 causes the rotary movement of the deflecting blade. Specifically, this means consists in, as seen in Figures 1, 2, and 10, an extendible and retractable bar member 58 having one end connected to the deflecting blade 56 intermediate its ends and having the other end operatively connected for pivotal movement to the leveling blade 17 intermediate its ends. The bar member 58 is composed of two parts 59 and 61, the former being of L-shaped configuration and slidably receiving within its longer leg the lat-

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ter-named part 61. Bolts 62 secure the part 61 within the part 59 in any one of several adjusted positions. A bearing sleeve 63 positioned within the open lower end of the short leg of the part 59 receives the stem 64 of another T-shaped coupling member 65. A pivot pin 66 extends through a bore in the coupling member 65 and has its head bearing against one leaf of a leaf spring 67, the other leg of the leaf spring 67 being welded and fixedly secured to the plate 53 at a point which is substantially mid-length of the deflecting blade 56. Another support member 68 has threaded bifurcated lower ends held in apertures provided in the plate 53 with other springs and nuts, 69 and 71, respectively, as in Figure 10, resiliently supporting the deflecting blade 56 on the lower end of the short leg of the part 59 of the bar member 58.

A pin 72 is pivotally connected to the free end of the part 61 of the bar member 58 for swinging movement about a horizontal axis and is received in a bore provided in a bracket 73 detachably secured to the backside of the leveling blade 17. Projecting upwardly from the end of the support 28 adjacent the hanger 46 is a vertically extending bearing block 74 supporting a Y-shaped clevis 75 which has a pin 76 extending through its arms for the pivotal support of an eye-formation 77 provided on the upper end of a hydraulic cylinder 78. The arm 79 of the hydraulic cylinder 78 is pivotally connected at its free end between a pair of upstanding lugs 81a secured to the upper surface of the plate 53 at a point adjacent to and spaced inwardly of the leaf spring 67.

Referring to Figures 11 to 14, inclusive, strut means is shown having one end pivotally connected to the support 28 and having its other end connected to the free end of the part 61 of the bar member 58. This strut means consists in an upright bearing sleeve 81 receiving the pin 72 which is pivotally connected to the free end of the part 61 of the bar member 58. An upper arm 82 projects from the upper end of the sleeve 81 and a lower arm 83 projects in the same plane as the arm 82 from the lower end of the sleeve 81. An apertured lug 84 projects from the adjacent end of the support 28 and pivotally connects, by means of a suitable pin 84a, the upper arm 82 to the support 28. A similar apertured lug 85 projects from the adjacent side of the hanger 46 and connects the lower arm 83 to the hanger 46 by means of another suitable pin 85a.

A connecting element constituting a bar 86 extends between the bracket 73 which is fixed to the backside of the leveling blade 17 and is pivotally connected to the bracket 73 by means of a pivot pin 87, seen in Figure 14, and has its other end secured between horizontally disposed lugs 88 and 89 which project from the side of the sleeve 81 at an angle to the arms 82 and 83. A nut and bolt assembly 91 (Figure 13) is used as a means of connecting the adjacent end of the bar 86 to the lugs 88 and 89.

In operation, the road grader 15 may be driven over a road surface with the deflecting blade 56 positioned as shown in Figures 1 to 3, inclusive, and extending over the slope adjacent to the road surface. The angularity of the deflecting blade 56 may be adjusted by the operator of the road vehicle 15 by swinging the leveling blade from the solid line position shown in Figure 1 to the dotted line position. The bar member 58 may be adjusted so that the deflecting blade 56 may be positioned at any angle with respect to the support 28 that is desired. The hydraulic cylinder 78 may be used to apply pressure to the deflecting blade 76 in order to scrape the surface of the roadway slope. The deflecting blade 56 may be raised or lowered to avoid boulders and other obstructions by means of the hydraulic cylinder 78.

In Figures 11 and 12, the deflecting blade 56 is positioned so as to slope downwardly and away from the road surface and the strut means constituting the arms

82 and 83 and the bar 86 has been added so that the forward end of the bar member 58 is supported above the ground surface. In either of the slope engaging positions shown in Figures 1 to 3, inclusive, or in Figures 11 and 12, the angular pivotal connection of the support 28 with respect to anchoring element 26 of the bracket 21 permits the deflecting blade 56 to raise up over a boulder or other obstruction when struck, the support 28 being releasably held in its end to end alignment position with respect to the bracket 21 by the engagement of the flange 44 between the rollers 36.

The deflecting blade 56 may be moved to a nonuse position with the support 28 moved to the dotted line position shown in Figure 6 and with the hydraulic cylinder 78 lying parallel to the box structure 26 of the bracket 21. When the deflecting blade 56 is moved to the nonuse position, the bar member 58 and the strut means are each disconnected from their points of connection to the leveling blade and the deflecting blade.

What is claimed is:

1. The combination with a wheeled frame having a forward end and a rearward end, and an upstanding leveling blade positioned beneath said frame intermediate its ends so that it extends in a direction crosswise of said frame with one of its ends near the forward end of said frame and the other of its ends near the rearward end of said frame and connected to said frame for movement from the aforesaid position to a position in which said one end is near the rearward end of said frame and said other end is near the forward end of said frame, of a slope grader attachment comprising a bracket positioned behind the rearward end of said frame and fixedly secured to said frame, a horizontally disposed anchoring element positioned parallel to the rearward end of said frame and fixedly carried by said bracket, a horizontally disposed support positioned in confronting end to end aligned relation with respect to said anchoring element and carried by said anchoring element, said anchoring element and said support being positioned so as to slope upwardly toward the forward end of the frame, an upstanding deflecting blade positioned outwardly of said support so that it extends in a downwardly sloping direction away from said support and connected adjacent one end to the non-confronting end of said support for up and down movement and for rotary movement, means connecting said deflecting blade to said leveling blade so that movement of said leveling blade from the position in which one of its ends is near the forward end of said frame and the other of its ends is near the rearward end of said frame to a position in which said one end is near the rearward end of said frame and the other end is near the forward end of said frame causes the rotary movement of said deflecting blade, and means operatively connected to said deflecting blade for effecting the up and down movement of the latter.

2. The combination with a wheeled frame having a forward end and a rearward end, and an upstanding leveling blade positioned beneath said frame intermediate its ends so that it extends in a direction crosswise of said frame with one of its ends near the forward end of said frame and the other of its ends near the rearward end of said frame and connected to said frame for movement from the aforesaid position to a position in which said one end is near the rearward end of said frame and said other end is near the forward end of said frame, of a slope grader attachment comprising a bracket positioned behind the rearward end of said frame and fixedly secured to said frame, a horizontally disposed anchoring element positioned parallel to the rearward end of said frame and fixedly carried by said bracket, a horizontally disposed support positioned in confronting end to end aligned relation with respect to said anchoring element and carried by said anchoring element, said anchoring element and said support being positioned so as to slope upward toward the forward end of the frame, an upstanding de-

flecting blade positioned outwardly of said support so that it extends in a downwardly sloping direction away from said support and connected adjacent one end to the non-confronting end of said support for up and down movement about a horizontal axis and for rotary movement about a vertical axis, means connecting said deflecting blade to said leveling blade so that movement of said leveling blade from the position in which one of its ends is near the forward end of said frame and the other of its ends is near the rearward end of said frame to a position in which said one end is near the rearward end of said frame and the other end is near the forward end of said frame causes the rotary movement of said deflecting blade, and means operatively connected to said deflecting blade for effecting the up and down movement of the latter.

3. The combination with a wheeled frame having a forward end and a rearward end, and an upstanding leveling blade positioned beneath said frame intermediate its ends so that it extends in a direction crosswise of said frame with one of its ends near the forward end of said frame and the other of its ends near the rearward end of said frame and connected to said frame for movement from the aforesaid position to a position in which said one end is near the rearward end of said frame and said other end is near the forward end of said frame, of a slope grader attachment comprising a bracket positioned behind the rearward end of said frame and fixedly secured to said frame, a horizontally disposed anchoring element positioned parallel to the rearward end of said frame and fixedly carried by said bracket, a horizontally disposed support positioned in confronting end to end aligned relation with respect to said anchoring element and connected at the confronting end to said anchoring element for movement of the support from the end to end aligned position to a position in which the support is in back to back position with respect to said anchoring element, an upstanding deflecting blade positioned outwardly of the other side of said support so that it extends in a downwardly sloping direction away from said support and connected adjacent one end to the non-confronting end of said support for up and down movement about a horizontal axis and for rotary movement about a vertical axis, means connecting said deflecting blade to said leveling blade so that movement of said leveling blade from the position in which one of its ends is near the forward end of said frame and the other of its ends is near the rearward end of said frame to a position in which said one end is near the rearward end of said frame and the other end is near the forward end of said frame causes the rotary movement of said deflecting blade, and means operatively connected to said deflecting blade for effecting the up and down movement of the latter.

4. The combination with a wheeled frame having a forward end and a rearward end, and an upstanding leveling blade positioned beneath said frame intermediate its ends so that it extends in a direction crosswise of said frame with one of its ends near the forward end of said frame and the other of its ends near the rearward end of said frame and connected to said frame for movement from the aforesaid position to a position in which said one end is near the rearward end of said frame and said other end is near the forward end of said frame, of a slope grader attachment comprising a bracket positioned behind the rearward end of said frame and fixedly secured to said frame, a horizontally disposed anchoring element positioned parallel to the rearward end of said frame and fixedly carried by said bracket, a horizontally disposed support positioned in confronting end to end aligned relation with respect to said anchoring element and connected at the confronting end to said anchoring element for movement of the support from the end to

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end aligned position to a position in which the support is in back to back position with respect to said anchoring element, spring means operatively connected to said bracket for retaining said support in its end to end alignment position, an upstanding deflecting blade positioned outwardly of said support so that it extends in a downwardly sloping direction away from said support and connected adjacent one end to the non-confronting end of said support for up and down movement about a horizontal axis and for rotary movement about a vertical axis, means connecting said deflecting blade to said leveling blade so that movement of said leveling blade from the position in which one of its ends is near the forward end of said frame and the other of its ends is near the rearward end of said frame to a position in which said one end is near the rearward end of said frame and the other end is near the forward end of said frame causes the rotary movement of said deflecting blade, and means operatively connected to said deflecting blade for effecting the up and down movement of the latter.

5. The combination with a wheeled frame having a forward end and a rearward end, and an upstanding leveling blade positioned beneath said frame intermediate its ends so that it extends in a direction crosswise of said frame with one of its ends near the forward end of said frame and the other of its ends near the rearward end of said frame and connected to said frame for movement from the aforesaid position to a position in which said one end is near the rearward end of said frame and said other end is near the forward end of said frame, of a slope grader attachment comprising a bracket positioned behind the rearward end of said frame and fixedly secured to said frame, a horizontally disposed anchoring element positioned parallel to the rearward end of said frame and fixedly carried by said bracket, a horizontally disposed support positioned in confronting end to end aligned relation with respect to said anchoring element and carried by said anchoring element, said anchoring element and said support being positioned so as to slope upwardly toward the forward end of the frame, an upstanding deflecting blade positioned outwardly of said support so that it extends in a downwardly sloping direction away from said support and connected adjacent one end to the non-confronting end of said support for up and down movement about a horizontal axis and for rotary movement about a vertical axis, means connecting said deflecting blade to said leveling blade so that movement of said leveling blade from the position in which one of its ends is near the forward end of said frame and the other of its ends is near the rearward end of said frame to a position in which said one end is near the rearward end of said frame and the other end is near the forward end of said frame causes the rotary movement of said deflecting blade, and means operatively connected to said deflecting blade for effecting the up and down movement of the latter, said last-named means embodying an extendible and retractable bar member and having one end pivotally connected to said deflecting blade intermediate its ends and having the other end operatively connected for pivotal movement to said leveling blade intermediate its ends.

6. The combination with a wheeled frame having a forward end and a rearward end, and an upstanding leveling blade positioned beneath said frame intermediate its ends so that it extends in a direction crosswise of said frame with one of its ends near the forward end of said frame and the other of its ends near the rearward end of said frame and connected to said frame for movement from the aforesaid position to a position in which said one end is near the rearward end of said frame, and said other end is near the forward end of said frame, of a slope grader attachment comprising a bracket positioned behind the rearward end of said frame and fixedly secured to said frame, a horizontally disposed anchoring element positioned parallel to the rearward end of said

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frame and fixedly carried by said bracket, a horizontally disposed support positioned in confronting end to end aligned relation with respect to said anchoring element and carried by said anchoring element, said anchoring element and said support being positioned so as to slope upwardly toward the forward end of the frame, an upstanding deflecting blade positioned outwardly of said support so that it extends in a downwardly sloping direction away from said support and connected adjacent one end to the non-confronting end of said support for up and down movement about a horizontal axis and for rotary movement about a vertical axis, means connecting said deflecting blade to said leveling blade so that movement of said leveling blade from the position in which one of its ends is near the forward end of said frame and the other of its ends is near the rearward end of said frame to a position in which said one end is near the rearward end of said frame and the other end is near the forward end of said frame causes the rotary movement of said deflecting blade, and means operatively connected to said deflecting blade for effecting the up and down movement of the latter, said last-named means embodying an extendible and retractable bar member and having one end pivotally connected to said deflecting blade intermediate its ends and having the other end directly connected for pivotal movement to said leveling blade intermediate its ends.

7. The combination with a wheeled frame having a forward end and a rearward end, and an upstanding leveling blade positioned beneath said frame intermediate its ends so that it extends in a direction crosswise of said frame with one of its ends near the forward end of said frame and the other of its ends near the rearward end of said frame and connected to said frame for movement from the aforesaid position to a position in which said one end is near the rearward end of said frame and said other end is near the forward end of said frame, of a slope grader attachment comprising a bracket positioned behind the rearward end of said frame and fixedly secured to said frame, a horizontally disposed anchoring element positioned parallel to the rearward end of said frame and fixedly carried by said bracket, a horizontally disposed support positioned in confronting end to end aligned relation with respect to said anchoring element and carried by said anchoring element, said anchoring element and said support being positioned so as to slope upwardly toward the forward end of the frame, an upstanding deflecting blade positioned outwardly of said support so that it extends in a downwardly sloping direction away from said support and connected adjacent one end to the non-confronting end of said support for up and down movement about a horizontal axis and for rotary movement about a vertical axis, means connecting said deflecting blade to said leveling blade so that movement of said leveling blade from the position in which one of its ends is near the forward end of said frame and the other of its ends is near the rearward end of said frame to a position in which said one end is near the rearward end of said frame and the other end is near the forward end of said frame causes the rotary movement of said deflecting blade, means operatively connected to said deflecting blade for effecting the up and down movement of the latter, said last-named means embodying an extendible and retractable bar member and having one end pivotally connected to said deflecting blades intermediate its ends, strut means having one end pivotally connected to said support, an upstanding bearing sleeve carried by the other end of said strut means, the other end of said bar member being connected for pivotal movement to said sleeve, and a connecting element having one end pivotally connected to said sleeve and having the other end connected for pivotal movement to the adjacent end portion of said leveling blade.

References Cited in the file of this patent

UNITED STATES PATENTS

1,529,727	Synsteby	Mar. 17, 1925	1,875,534
1,818,434	Scheffold	Aug. 11, 1931	1,981,284
1,843,260	Arnold et al.	Feb. 2, 1932	2,125,134
			2,284,463
			2,659,988

Wegener	Sept. 6, 1932
Ray et al.	Nov. 20, 1934
Thompson	July 26, 1938
Wilson	May 26, 1942
Braden et al.	Nov. 24, 1953