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2,074,565

ROAD GRADER

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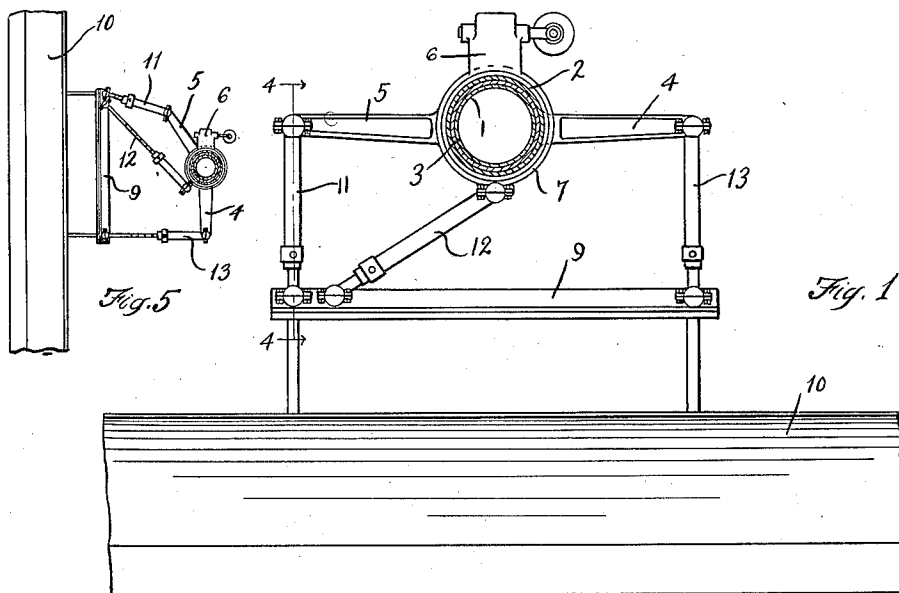


Fig. 5

Fig. 1

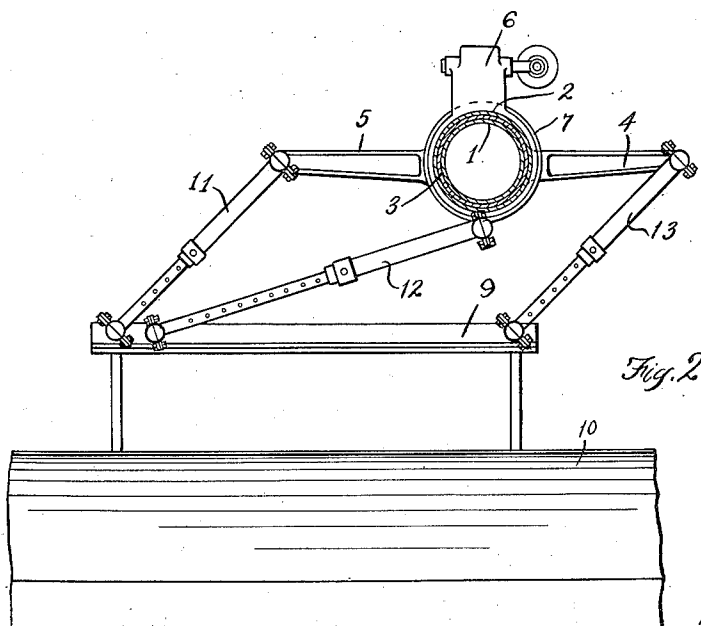


Fig. 2

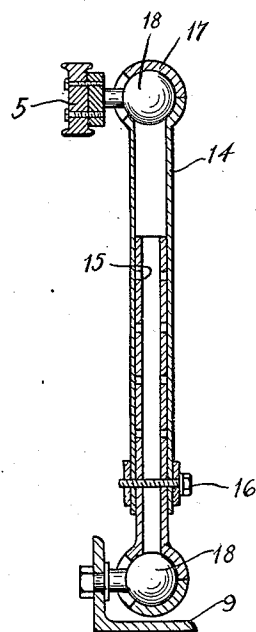


Fig. 4

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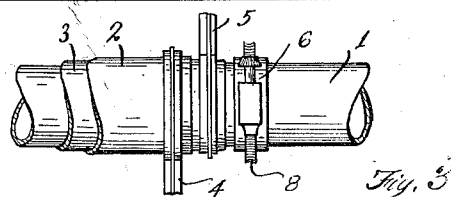


Fig. 3

UNITED STATES PATENT OFFICE

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ROAD GRADER

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mesne assignments, to W. A. Riddell Corpora-
tion, Bucyrus, Ohio, a corporation of Ohio

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6 Claims. (Cl. 37—156)

This invention relates as indicated to road graders and more particularly to graders of the type including a main frame from which adjustably depends an auxiliary frame carrying an earth-working tillage tool such as a scraper blade. More specifically, my invention relates to the means connecting the main frame and the auxiliary tool-carrying frame whereby the auxiliary frame and the tool carried thereby may be moved relatively to the main frame over a greater latitude than is possible with apparatus heretofore employed.

In working the edges and ditches as well as the adjacent banks of roadways with graders as heretofore constructed, it has been necessary to use a blade extension attached to the end of the grader blade in order that the grader blade might reach the surface to be worked. It is among the objects of my invention to provide a road grader apparatus, particularly the means for supporting the implement carrying frame on the main frame of the grader whereby the implement may be supported in operable position appreciably laterally of the main frame so as to be able to reach heretofore inaccessible areas and to obviate the necessity of the application of auxiliary equipment in order to cut to and including a vertical plane.

Other objects of my invention will appear as the description proceeds.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing:—

Figure 1 is a transverse sectional view of a road grader embodying the principles of my invention; Figure 2 is a view similar to Figure 1 showing the apparatus arranged so that the scraper blade is supported in a position laterally removed from the position illustrated in Figure 1; Figure 3 is a fragmentary, part sectional, part plan view of a portion of the apparatus illustrated in the previous figures; Figure 4 is a fragmentary, sectional view of a portion of the apparatus illustrated in Figure 1 taken on a plane substantially indicated by the line 4—4; and Figure 5 is a schematic diagram illustrating the manner in which the grader blade may be adjusted to cut on a vertical bank.

Referring now more specifically to the drawing and more especially to Figure 1, it will be noted

that only so much of the grader as is necessary to show the principles of my invention has been illustrated herein. While the principles of my invention are applicable to any type of road grader, a grader of the form of construction illustrated in my Patent No. 1,915,105, granted June 20, 1933, has been chosen for purposes of illustration.

Such grader as illustrated in the aforesaid patent is characterized by the employment of a tubular longitudinally extending reach member comprising the main frame of the machine. It is believed that the principles of my invention may be understood without a more detailed disclosure of the entire grader apparatus to which the same be applied.

Referring, therefore, to Figure 1, the tubular reach member generally indicated at 1 which forms the main frame of the machine has, as further illustrated in Figure 3, a plurality of sleeves generally indicated at 2 and 3 journaled on its outer periphery, such sleeves respectively carrying lifting arms 4 and 5. Any suitable means may, of course, be employed for relatively rotating the sleeves 2 and 3 with respect to the tubular member 1 and independently of each other.

Clamped to the frame 1 forwardly of the arm 5 is a bracket generally indicated at 6, such bracket housing suitable gear means whereby a collar generally indicated at 7 and which is journaled on the outer periphery of the frame 1 may be rotated by means of a gear 8.

Positioned in underlying relation to the main frame 1 is an auxiliary frame generally indicated at 9 which supports an earth-working or tillage tool illustrated in the drawing as a scraper blade 10.

My invention relates particularly to the means for interconnecting the auxiliary frame 9 and the arms 4 and 5 and the collar 7, whereby the scraper blade 10 may be supported either directly underneath the main frame 1 as is most convenient when operating on the central portions of the roadway or laterally of such main frame 1 as illustrated in Figures 2 and 5 when it is desired to operate on areas lying alongside the road or on a vertical bank at the side of the road.

The connecting means making possible the above-mentioned manipulation of the earth-working tool comprises extensible links generally indicated at 11, 12 and 13, the form of construction of which is most clearly illustrated in Figure 4.

By having reference to Figure 4, each of the links 11, 12 and 13 consists of an outer tubular

member 14 and a telescopically engaged inner member 15, the former, at its lower end, being provided with aligned transversely extending holes and the latter with similar holes at axially spaced points. A bolt 16 or other suitable means is employed to extend through the aligned holes in the outer member and a select pair of holes in the inner member whereby to maintain the link in any one of a plurality of extended positions.

The terminals of the members 14 and 15 are respectively provided with removable caps 17 forming with the body of such members recesses for ball and socket joints. The complementary ball members 18 of such joints are adapted to be secured either to the arms 4 and 5 and collar 7 or portions of the auxiliary frame 9.

When the grader is to operate over a portion of the road surface which can conveniently be straddled by the supporting wheels of the grader, the links 11 to 13 will be adjusted to their shortest length and the blade 10 may then be suitably moved relatively to the road surface by a proper manipulation of the arms 4 and 5 and the collar 7. Any manipulation of the arms 4 and 5 and the collar 7 with the links adjusted as illustrated in Figure 1 is, however, ineffectual to move the grader blade for any appreciable distance laterally with respect to the main frame 1, or to support the blade for operation on a substantially vertical bank. This can be accomplished, however, by selectively extending the links 11 to 13 in the manner illustrated in Figures 2 and 5, whereby the blade will be supported in a position laterally of the main frame in any desired position between the horizontal and vertical and in such position properly manipulated by movement of the arms 4 and 5 and the collar 7. When the blade is supported in the positions illustrated in Figures 2 and 5, it may reach lateral portions of the road surface, ditches and banks which would otherwise be inaccessible or accessible only by having the wheels on one side of the grader operate in the ditch, or by employing a special attachment on the blade. When employing a grader construction in accordance with the principles of my invention, the wheels of the grader may, at all times, be maintained on solid footing and the operation of the grader accordingly greatly facilitated.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I claim:

1. In a road grader, the combination of a tubular main frame, an implement carrying frame beneath said main frame, lifting arms journaled on the outer periphery of and extending laterally from said main frame, telescopic extensible links oscillatably secured at their opposite ends respectively to said arms and opposite sides of said implement carrying frame, a collar journaled on said main frame, and an extensible link oscillatably secured at one end to said collar, extending diagonally with respect to said first named links and oscillatably secured at its opposite end to said implement carrying frame.

2. In a road grader, the combination of a tubular reach, concentric sleeves journaled on said reach, an earth working tool, means supported by said concentric sleeves adjustably supporting said tool in a plane transversely of the axis of said reach, said means including oppositely extended arms each mounted on separate sleeves and telescopic members pivotally connected to each arm and to said tool, a collar mounted coaxially with said sleeves, a link pivotally connected to said collar and pivotally connected to said tool; and means whereby said collar may be rotated.

3. In a road grader, the combination of a tubular reach, concentric sleeves journaled on said reach, an earth working tool, means supported by said concentric sleeves adjustably supporting said tool in a plane transversely of the axis of said reach, said means including oppositely extended arms each mounted on separate sleeves and extensible members pivotally connected to each arm and to said tool, a collar rotatably mounted coaxial with said sleeves, a diagonal extensible brace pivotally connected to said collar and to said tool, and means whereby said collar may be rotated.

4. In a road grader, the combination of a main frame, an implement carrying frame beneath said main frame, said main frame comprising a bearing shaft, lifting arms independently journaled on said shaft and extending laterally of said frame, extensible links oscillatably secured at their opposite ends respectively to said arms and to opposite sides of said implement carrying frame, a member rotatably mounted on a bearing in said main frame coaxial with said shaft, and an extensible link oscillatably secured to said member and to said implement carrying frame, said link extending diagonally with respect to said first named links.

5. In a road grader, the combination with a main frame and an implement carrying frame below said main frame, of means for supporting said implement carrying frame on said main frame comprising lifting arms movably and coaxially supported on and extending laterally in opposite directions from said main frame, extensible links interconnecting the outwardly extending ends of said arms and said implement carrying frame and a diagonal extensible bracing link pivotally connected at its opposite ends to said frames.

6. In a road grader, the combination with a main frame and an implement carrying frame below said main frame, of means for supporting said implement carrying frame on said main frame comprising lifting arms movably and coaxially supported on and extending laterally in opposite directions from said main frame, extensible links interconnecting the outwardly extending ends of said arms and said implement carrying frame, a member rotatably mounted in said main frame, an extensible link pivotally connected by one end to said member and pivotally connected by the other end to said implement carrying frame, and disposed diagonally relative to the links first named; each of said links having means adapted to hold its parts fixed in adjusted relative position.

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