Dec. 1, 1931. E. C. GLEDHILL 1,834,241

ROAD GRADER

Filed Nov. 5, 1930 3 Sheets-Sheet 1

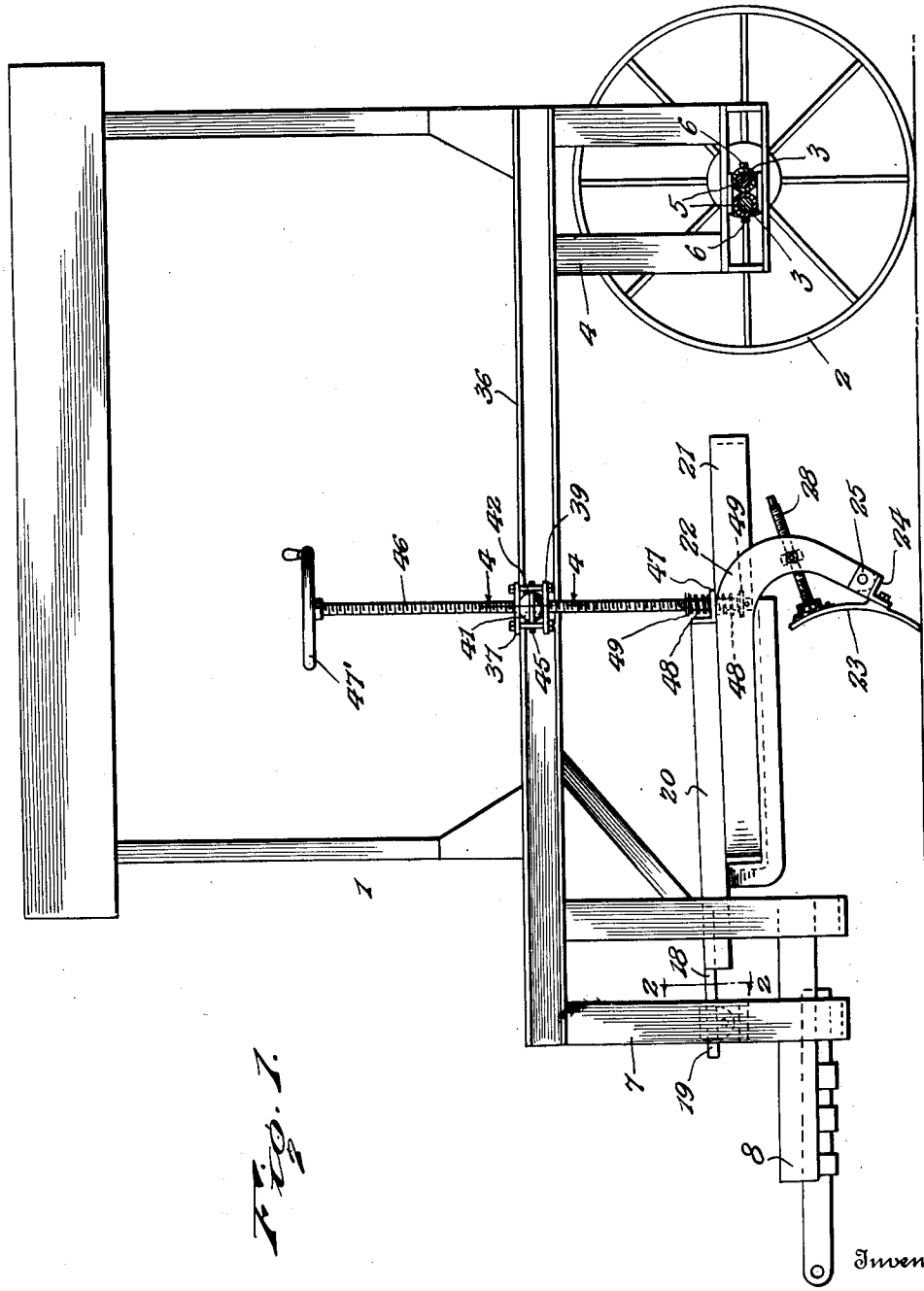


Fig. 1.

Inventor

E. C. Gledhill.

By Lacey & Lacey, Attorneys

Dec. 1, 1931. E. C. GLEDHILL 1,834,241

ROAD GRADER

Filed Nov. 5, 1930 3 Sheets-Sheet 2

Fig. 2.

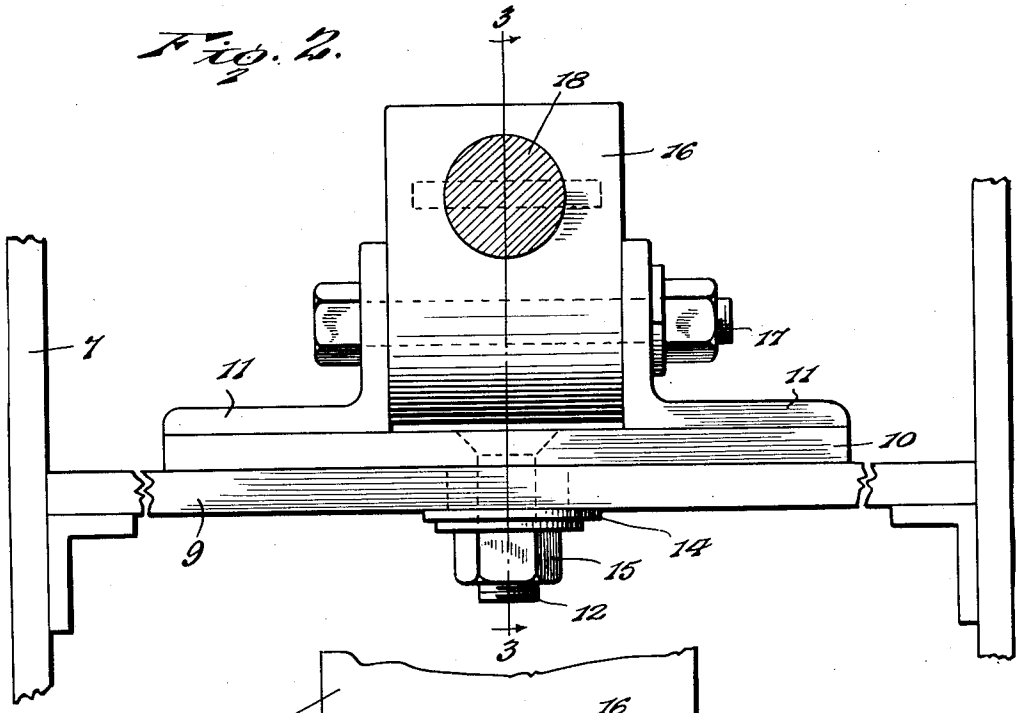
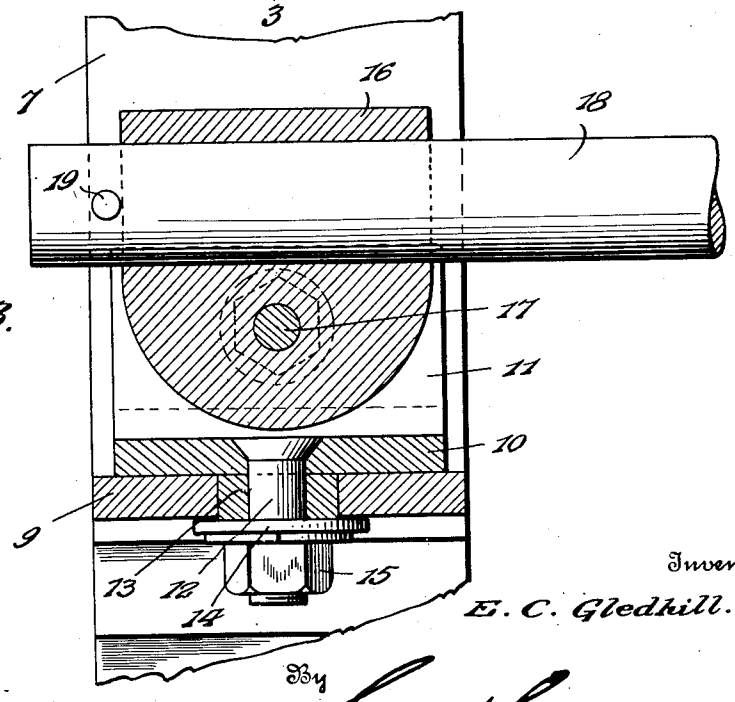


Fig. 3.



Inventor

E. C. Gledhill.

By Lacey & Lacey,

Attorneys

Dec. 1, 1931. E. C. GLEDHILL 1,834,241

ROAD GRADER

Filed Nov. 5, 1930 3 Sheets-Sheet 3

Fig. 4.

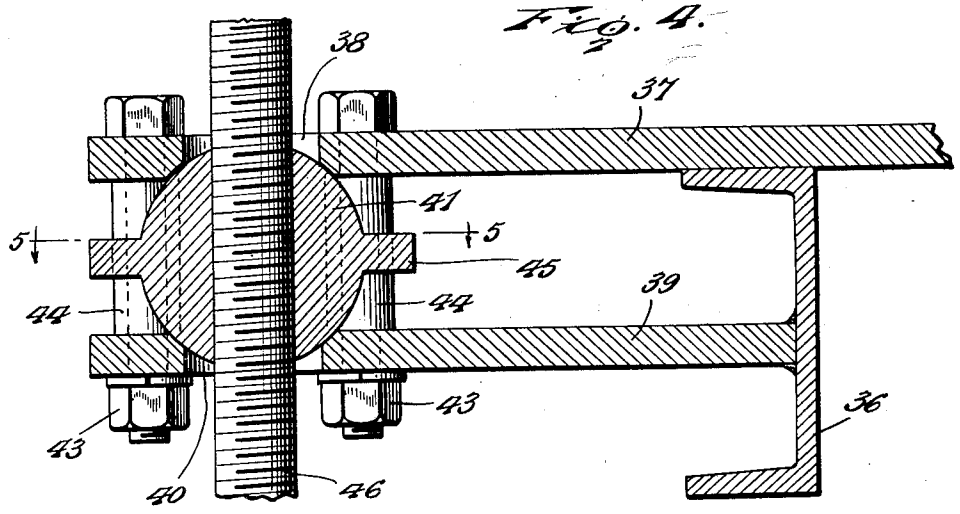


Fig. 5.

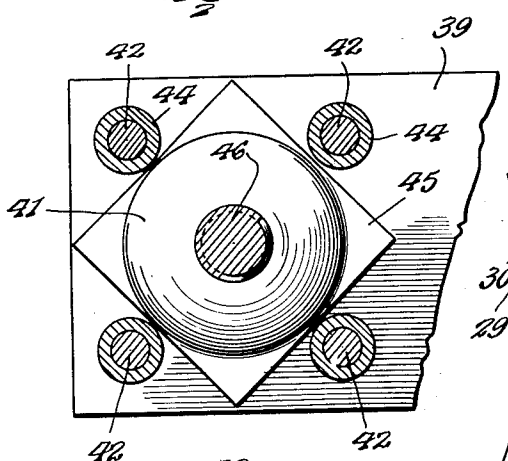


Fig. 6.

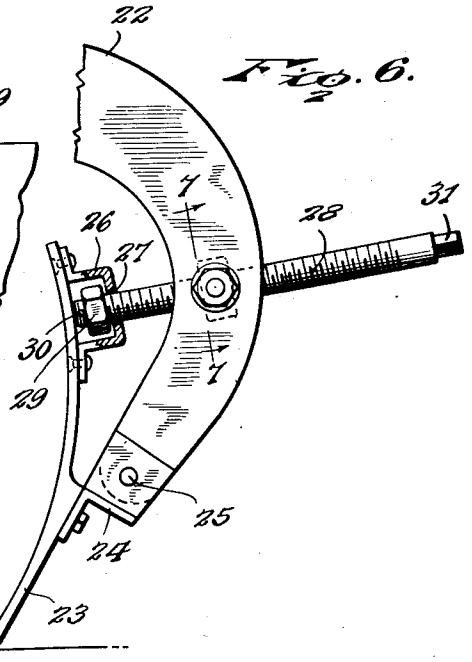
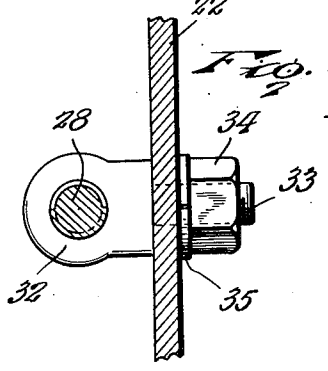


Fig. 7.



Inventor

E. C. Gledhill.

By Lacey & Lacey, Attorneys

Patented Dec. 1, 1931

1,834,241

UNITED STATES PATENT OFFICE

EDWARD C. GLEDHILL, OF GALION, OHIO, ASSIGNOR TO THE GLEDHILL ROAD MACHINERY CO., OF GALION, OHIO, A CORPORATION OF OHIO

ROAD GRADER

Application filed November 5, 1930. Serial No. 493,642.

This invention relates to road graders or scrapers and has for its object the provision of novel means for adjusting the moldboard or scraper blade whereby the blade may be set in a desired position easily and quickly and will be firmly held in the position in which it may be set. The invention is illustrated in the accompanying drawings and consists in certain novel features which will be hereinafter first fully described and then more particularly defined in the appended claims.

In the accompanying drawings:

Figure 1 is an elevation of a road grader embodying the present invention,

Fig. 2 is an enlarged detail section on the line 2—2 of Fig. 1,

Fig. 3 is an enlarged section on the line 3—3 of Fig. 2,

Fig. 4 is an enlarged detail section on the line 4—4 of Fig. 1,

Fig. 5 is a section on the line 5—5 of Fig. 4,

Fig. 6 is an enlarged detail elevation, partly in section, of the end of the moldboard or scraper blade and the mounting for the same, and

Fig. 7 is a section on the line 7—7 of Fig. 6.

In carrying out the present invention, there is provided a main frame 1 which will preferably be constructed of metal and of conventional form. The rear end of the main frame is supported by ground wheels, one of which is shown at 2, and which are carried by the opposite ends of an axle which consists of two tubular members 3—3 disposed side by side and firmly secured in a supplemental frame 4 depending from the main frame, the wheels being mounted on the outer ends of rods 5 which are fitted closely but slidably within the respective tubes and held therein by set screws 6 in an obvious manner. This arrangement permits the wheels to be very easily adjusted transversely according to the demands of any particular work, the width of the road and other circumstances peculiar to the operation.

At the front end of the main frame, there is provided a supplemental frame 7 which depends from the main frame and at its lower end carries a drawbar coupling 8 of any convenient construction whereby the machine may be coupled to a tractor, it being an object of the invention to provide a grader which, while strong and durable, will be light enough to be readily connected to a tractor and drawn over a road by the same.

Disposed transversely within the depending supplemental frame 7 is a cross bar 9 and upon this cross bar is pivotally secured a base plate or bar 10 which rests upon the cross bar 9 and has right angular brackets 11 formed on or rigidly secured upon its upper surface at its ends, as clearly shown in Fig. 2. The base bar or plate 10 is provided at its center with an opening through which a pivot bolt or stud 12 is inserted to pass through a mating opening provided in the cross bar 9, a bushing 13 being fitted upon the pivot bolt or rivet within the opening of the cross bar 9, as clearly shown in Fig. 3. Washers 14 are mounted upon the bolt below the bar 9 and a securing nut 15 is mounted on the bolt to be turned home against the washers so as to firmly secure the parts together but permit them to readily turn pivotally upon the cross bar 9, it being noted that the washers have a diameter greater than the diameter of the bushing 13 so that, while the washers may bear against the under side of the cross bar 9 and furnish a firm bearing for the securing nut, they will not prevent relative rotation of the bushing. It may be further noted that this bushing may be a boss formed integral with the base bar 10 if so desired and the brackets 11 may be integral with said base bar or may be welded or otherwise secured thereto. Disposed between the upstanding members of the right angular brackets 11 is a block 16 which is fitted upon a bolt 17 inserted horizontally through said end members and secured in the same, the lower side of the block 16 defining an arc concentric with said bolt, as clearly shown in Fig. 3, whereby the block may rotate about the bolt as a center and permit the blade to be set higher or lower as may be desired and as will be presently more particularly set forth. Above the bolt 17, which is disposed transversely of the machine, an opening is formed through the block longitudinally of the machine and

through said opening is inserted the front end of a perch or tongue 18 which is held against withdrawal from the block by a key or other fastening 19 inserted through the front end of the perch or tongue in advance of the block so that it may bear against the front side of the latter. This perch or tongue 18 is of circular cross section, as shown clearly in Fig. 2, whereby it may turn in the block 16 and thereby permit the blade to have one end set higher than the opposite end. The tongue 18 is secured rigidly to the front end of a lower frame 20 which includes the usual circle 21 and extends rearwardly under the main frame, as clearly shown in Fig. 1. The circle may be adjusted angularly within the lower frame 20 and held by a latch of well known form, this arrangement being common in road graders and the details thereof not being illustrated as they form no part of the present invention. Secured to the circle 21 are beams 22, the rear ends of which are turned downwardly, as shown in Fig. 1, and to which are attached the ends of the moldboard or scraper blade 23. The blade 23 is of the usual dished form and to the rear side thereof I secure brackets 24 which have upstanding portions disposed against the lower ends of the respectively adjacent beams and pivoted thereto, as shown at 25. By thus mounting the blade, it may be pivotally adjusted relative to the supporting beams so that its lower cutting edge will be set more nearly perpendicular as may be best fitted to accomplish the desired results upon any particular soil. Near the upper edge of the blade upon the back of the same, I secure brackets 26 which are in the form of bars having their ends disposed at angles to their intermediate portions and then turned outwardly so as to fit against and be secured against the rear side of the blade. An opening 27 is formed through the intermediate portion or shoulder of each bracket 26 and through said opening passes the front end of an adjusting bolt or threaded rod 28, a nut 29 being engaged with the end of the rod and retained thereon by a pin 30 inserted diametrically through the end of the rod, as shown in Fig. 6. To assemble these parts, the nut is disposed within the bracket and the end of the bolt or threaded rod is then inserted through the opening 27 and engaged in the nut and then turned so as to work through the nut and expose the opening provided to receive the fastening pin 30. When the pin is inserted, the nut will be effectually retained upon the rod or bolt and the latter will have a swiveled mounting within the bracket. The rear end of this adjusting rod or bolt is suitably shaped, as shown at 31, to be engaged by a turning tool and the intermediate portion thereof is threaded through an eye 32 disposed against the side of the beam and having a reduced threaded tenon or stud 33 passed through an opening provided therefor in the beam. A shoulder is thus provided at the base of the eye which will bear against the side of the beam and when a nut 34, mounted upon the threaded tenon, is turned home the eye will be firmly clamped in position. A spring washer 35 is preferably interposed between the beam and the securing nut so that accidental loosening of the nut will be prevented.

The side members 36 of the main frame are preferably channel bars, as shown most clearly in Fig. 4. Extending across the main frame and resting on said channeled side bars is a flat cross bar 37, the ends of which project laterally beyond the side bars, as clearly shown in Fig. 4, and in the projecting ends of this bar 37 are openings 38 which are of sufficient diameter to amply accommodate varying angular positions of an adjusting rod or shaft which is about to be described. Welded or otherwise secured to the outer side of the channeled bar 36 is a lower shorter plate 39 in the outer end of which is an opening 40 axially alined with the opening 38 and of the same diameter while disposed between the plates 37 and 38 is a ball 41, the diameter of which is such that opposite portions of its surface will extend into the openings 38 and 40, as shown in Fig. 4, whereby the ball will be held by and between the bars 37 and 39 but may readily turn therein, the inner edges of the respective openings 38 and 40 being beveled or flared so as to accommodate the curvature of the ball. Inserted vertically through the plates 37 and 39 at equi-distant points around the openings 38 and 40 and in rectangular relation are bolts 42 equipped at their lower ends with nuts 43 adapted to be turned home against the lower bar 39 and thereby maintain the bars in proper operative relation to the ball 41, spacing sleeves 44 being fitted around the several bolts between the two bars so as to maintain the parallelism of the bars, as will be understood. The ball 41 is formed with a rib 45 which is square when viewed in plan and has its corners projected between adjacent bolts 42, as clearly shown in Fig. 5, this arrangement serving to hold the ball 41 against turning in a horizontal plane so that it will serve as a nut for the threaded shaft or rod 46 inserted through its threaded bore disposed upon its vertical diameter. The upper end of this threaded shaft or rod 46 is equipped with a hand wheel 47′ whereby it may be conveniently turned and its lower end is pivotally attached to the circle 21 so that if the shaft or rod be rotated it will move upwardly or downwardly through the ball 41 and thereby raise or lower the corresponding side of the circle and the end of the bolt. It will be understood, of course, that the construction just described is duplicated at the opposite side of the machine and, therefore, the two ends of the blade may

be set at the same height or set at different heights according to the demands of the work. The lower end of the shaft or rod plays freely through a guide 47 on the rear end of the lower frame 20 and shock-absorbing springs 48 are disposed about the rod above and below this guide and between the same and abutments 49 provided on the shaft or rod. When the threaded shaft or rod 46 is rotated so as to move through the ball 41 and raise or lower the end of the blade, its angular relation to the main frame, of course, varies inasmuch as the upward or downward movement of the blade and the parts supporting it will cause a pivotal movement of the same about the bolt 17 in an obvious manner, and the ball 41 constitutes a swivel to permit the shaft or rod 46 to assume the proper position to accommodate this varying angular relation. When one end of the blade is set higher than the opposite end, the lower frame 20 with the circle 21 will be tilted transversely of the machine and this tilting movement will be accommodated by the fitting of the tongue 18 in the block 16 while the vertical adjustment of the blade, as stated, will be accommodated by the pivotal mounting of said block.

From the foregoing description, taken in connection with the accompanying drawings, it will be seen that I have provided a very simple, compact and inexpensive road grader which may be readily coupled to a tractor and drawn by the same over a road. While the machine is comparatively light, it is strong and durable and is efficient in operation, especially upon roads which are not subject to heavy traffic and in which the road material is comparatively loose so that it is especially desirable in those communities where an inexpensive grader is wanted.

Having thus described the invention, I claim:

1. In a road grader, the combination with a main frame, of a lower frame supported thereby, a blade carried by the lower frame, supporting bars projecting laterally from the sides of the main frame and arranged in superposed parallel relation, said bars being provided with openings therethrough adjacent their outer extremities, a spherical nut disposed between the bars and engaging in said openings, means for preventing movement of the nut in a horizontal plane, and an adjusting rod threaded through the nut and having its lower end pivoted to the lower frame.

2. In a road grader, the combination with a main frame, and a lower frame carried thereby, of a blade carried by the lower frame, upper and lower supporting bars projecting laterally from the side of the main frame and provided at their ends with openings therethrough, a spherical nut disposed between the bars and engaged in said openings, an angular rib on said nut, a plurality of securing bolts inserted through the bars about the openings therethrough, the corners of said rib being received between adjacent bolts, and an adjusting rod threaded through the nut and having its lower end pivoted to the lower frame.

In testimony whereof I affix my signature.

EDWARD C. GLEDHILL. [L. S.]