

June 26, 1923.

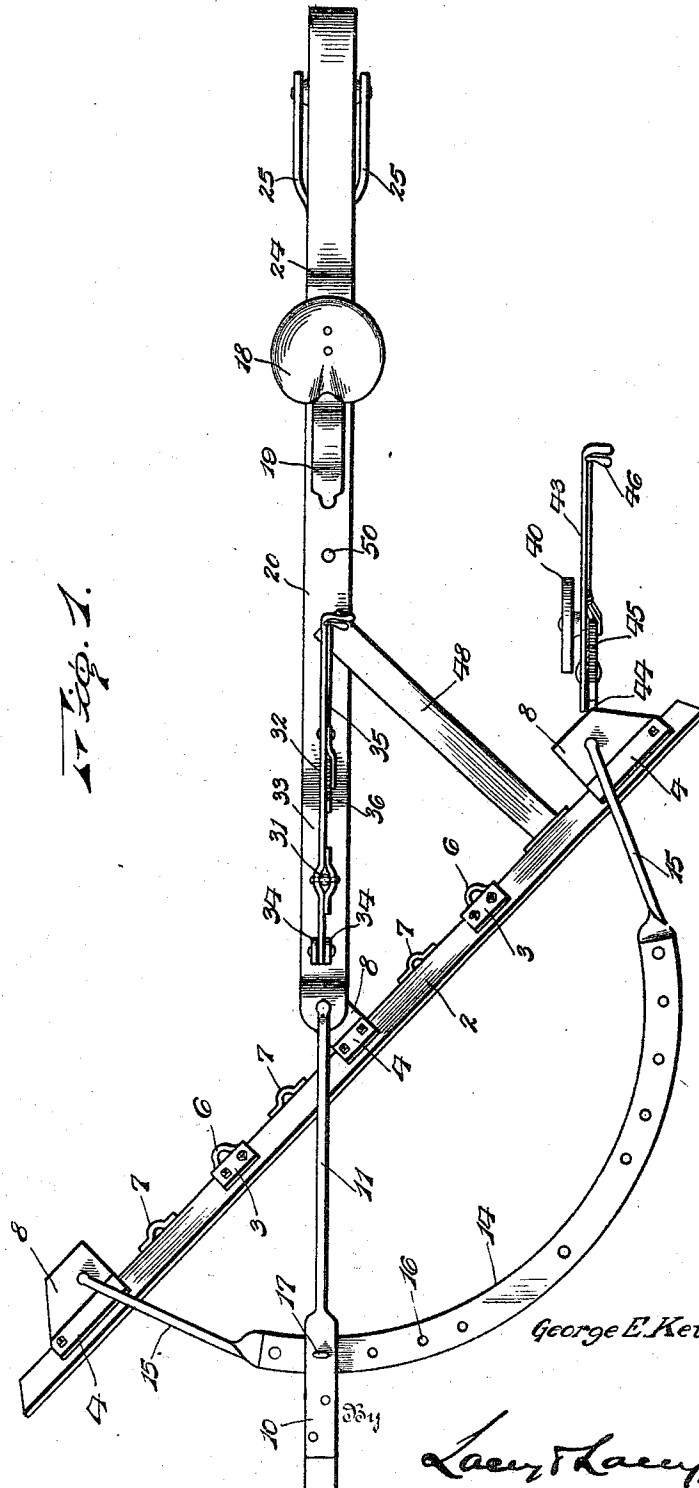
1,460,022

G. E. KETCHUM

GRADER

Filed Dec. 31, 1921

4 Sheets-Sheet 1



Inventor
George E. Ketchum.

Laury & Laury, Attorneys

June 26, 1923.

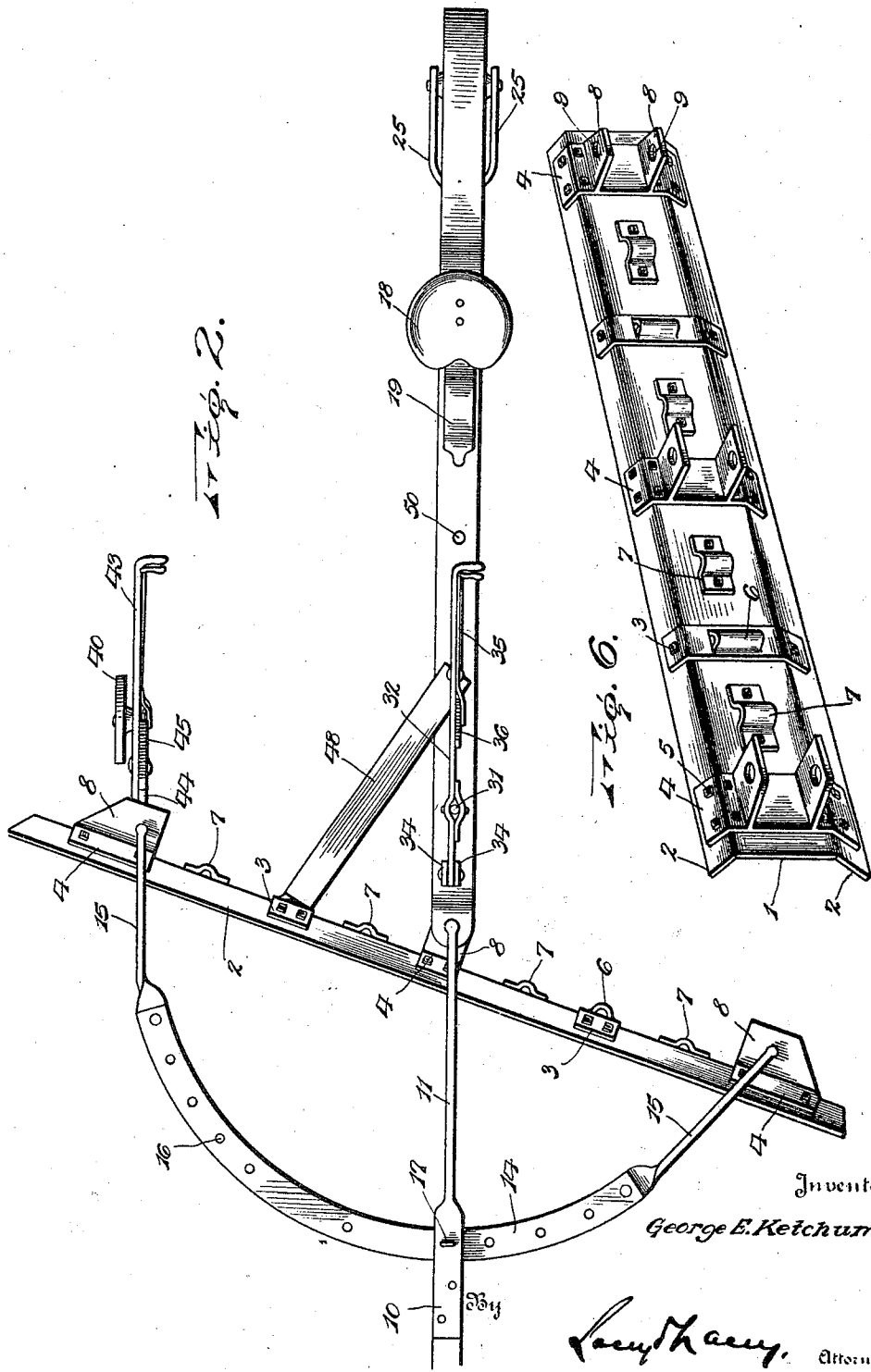
G. E. KETCHUM

1,460,022

GRADER

Filed Dec. 31, 1921

4 Sheets-Sheet 2



June 26, 1923.

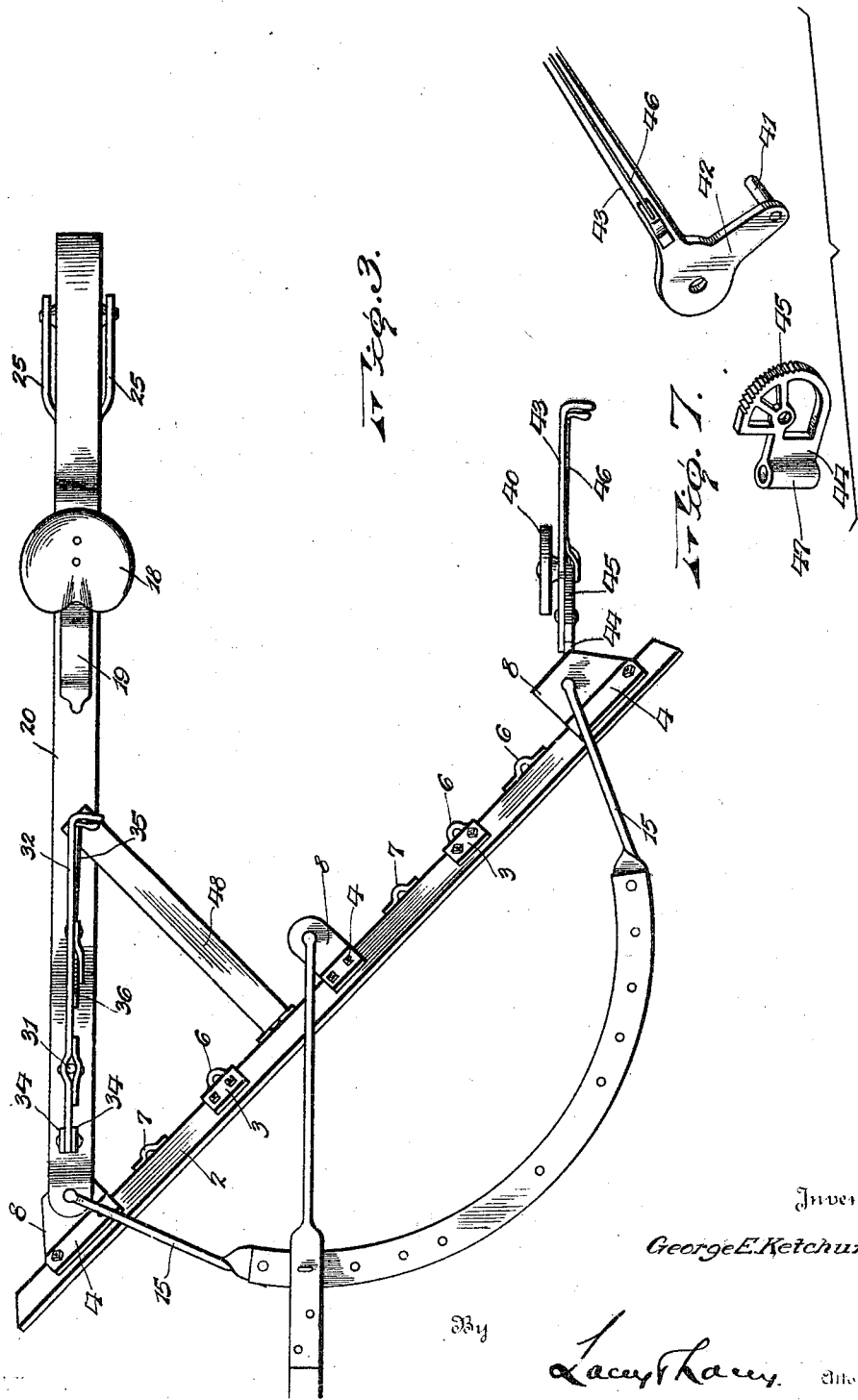
G. E. KETCHUM

1,460,022

GRADER

Filed Dec. 31, 1921

4 Sheets-Sheet 3



Inventor

George E. Ketchum.

By

Lacy & Kaur. Attorneys

June 26, 1923.

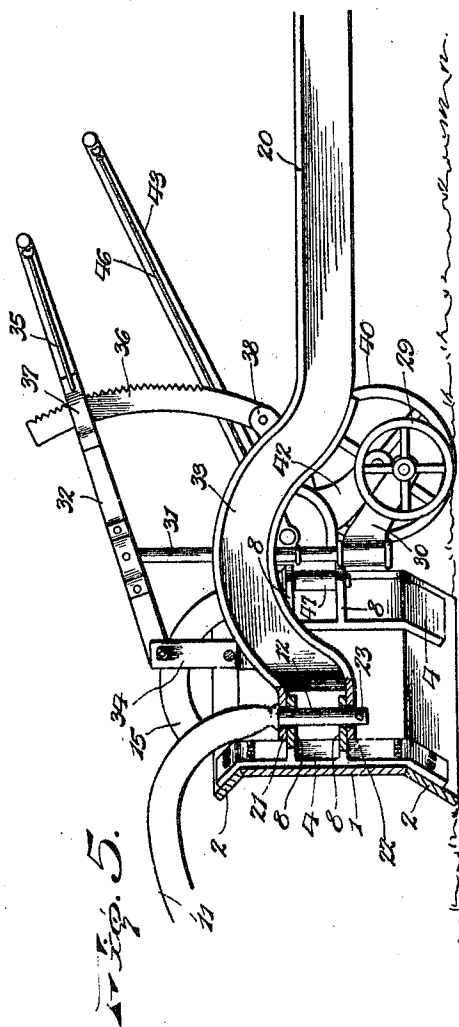
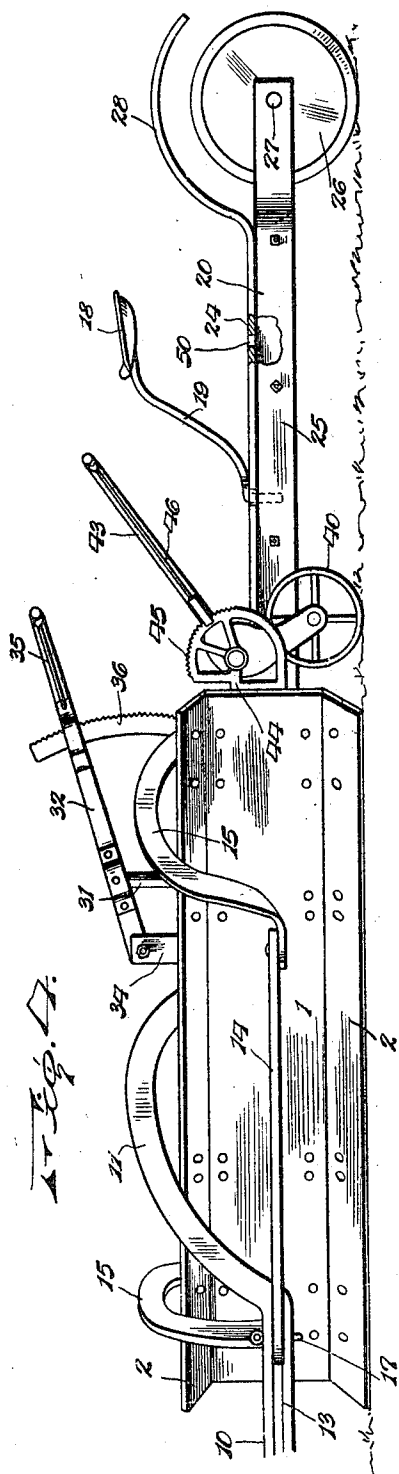
1,460,022

G. E. KETCHUM

GRADER

Filed Dec. 31, 1921

4 Sheets-Sheet 4



Inventor

George E. Ketchum.

Laury & Laury

Patented June 26, 1923.

1,460,022

UNITED STATES PATENT OFFICE.

GEORGE E. KETCHUM, OF MARCELINE, MISSOURI.

GRADER.

Application filed December 31, 1921. Serial No. 526,112.

To all whom it may concern:

Be it known that I, GEORGE E. KETCHUM, a citizen of the United States, residing at Marceline, in the county of Linn and State of Missouri, have invented certain new and useful Improvements in Graders, of which the following is a specification.

This invention relates to scrapers and graders and has for its object the provision of a scraper or grader in which the parts may be readily disassembled to permit the loading of the machine onto a wagon for transportation from place to place. The invention seeks to provide a machine having the stated characteristics which may be easily put together or taken apart by one man and which, when in use, will be so arranged and braced as to effectually withstand the strain placed thereupon. The invention seeks further to provide a grader which may be readily reversed or set to turn the dirt to either side as may be desired and also to provide means whereby the rear end of the blade may be supported at any desired height so as to direct the loose dirt toward the center of the road. The invention also seeks to provide novel means whereby the blade may be secured at various angles and also to provide means whereby the lateral skidding of the machine will be minimized and generally entirely overcome. Other objects of the invention will appear incidentally in the course of the following description, and the invention resides in certain novel features which will be particularly pointed out in the claims following the detailed description.

In the accompanying drawings—

Figure 1 is a plan view of a grader embodying my present improvements and showing one adjustment of the same;

Fig. 2 is a similar view showing the blade adjusted to turn the dirt to the opposite side of the road from that toward which it will be turned by the adjustment shown in Fig. 1;

Fig. 3 is a similar view showing a still further adjustment of the machine;

Fig. 4 is a side view;

Fig. 5 is an enlarged view partly in side elevation and partly in vertical section;

Fig. 6 is a detail perspective view of the blade;

Fig. 7 is a detail perspective view of the means for adjusting the height of the rear end of the blade.

In carrying out my invention, I employ a blade comprising a central member 1 which is preferably a straight flat metal plate arranged on edge. At both the upper and lower edges of this central plate I provide the cutting plates 2 which are connected rigidly with the central plate by brackets 3 and 4 having their end portions flared so as to conform to the angular relation of the members 1 and 2 and firmly secured to the said members by bolts 5, as will be readily understood, whereby the said members will be held fixedly in the proper relation. Either cutting member 2 may be used to act upon the surface of the ground and when the edge which has been in use becomes too dull for further service, the blade may be reversed and that edge which was formerly the upper member brought into active service. The brackets 3 have vertically disposed eyes 6 projecting from their intermediate portions and other eyes or loops 7 are secured to the back of the blade between the brackets 3 and 4, as clearly shown in Fig. 6. A bracket 4 is provided at the center of the blade and also at each end thereof and these brackets are constructed with upper and lower rearwardly projecting arms or plates 8 in which are provided eyes or openings 9. I also employ a draft bar or tongue 10 through which power may be applied to draw the scraper over the road or surface which is to be reduced and this draft bar terminates in an arched portion 11 which extends over the blade, as clearly shown, and terminates in a pin or cylindrical member 12 adapted to pass through the openings 9 in any of the arms 8. As shown clearly in the drawings and particularly in Fig. 4, the draft bar is provided with a forked portion 13 which is adapted to pass above and below a draft beam 14 which is arranged in advance of the blade and defines an arc having the central bracket 4 for its center. The draft beam 14 terminates in arched members 15 which rise over the blade and depend in rear of the same to engage in the openings 9 of the end brackets. Openings 16 are formed through the draft beam 14 and a pin 17 is provided to pass through a similar opening in the draft bar 10 and in one of the openings 16 whereby to hold the draft bar in any desired set position relative to the blade. It will be readily seen that the draft bar may be pivotally adjusted so as to assume

various angular relations to the blade and be held in said position so that the blade may be readily disposed at any desired angle to the line of travel.

5 A driver's seat 18 is carried by a seat standard 19 which is supported upon a main carrying beam 20. The front extremity of this beam 20 is constructed to present upper and lower arms or plates 21 and 22 provided with eyes which may register with the eyes 9 in any one of the brackets 4, the said arms 21 and 22 engaging respectively above and below the arms 8 of the bracket, as clearly shown in Fig. 5. The pin 12 is inserted through the openings in the several arms and thereby constitutes a pivotal connection between the blade and the main beam, a cotter pin or other retaining device 23 being fitted to the lower end of the pin 20 so as to prevent its accidental withdrawal under the lifting action which is imposed thereon in the use of the machine. The beam 20 may, of course, be a single integral structure or it may be in the form of a top plate 24 and side plates 25 depending from the edges of the top plate, the several plates being rigidly bolted together. The rear ends of the side plates receive between them a supporting wheel 26 which is carried by an axle 27 fitted in the extremities of said plates, and the rear end of the top plate 24 is carried upwardly and given an arcuate form, as shown at 28, whereby to serve as a fender or guard to prevent persons falling upon the wheel and also to prevent the dirt and mud which may be thrown up by the wheel striking the driver upon the seat 18. This wheel 26 is preferably a sharp edged disk adapted to take into the ground and thereby furnish a support to hold the blade to its work and prevent lateral skidding of the machine.

A caster 29 is provided at the front end of the main carrying beam 20 and this caster is carried by the lower end of a yoke 30 which is swiveled upon the lower end of a standard 31 extending slidably through the beam 20 and pivoted at its upper end to a hand lever 32. The portion of the beam 20 through which the standard or hanger 31 passes is arched, as shown at 33, so as to provide clearance for the movement of the caster 29 as it sways from side to side in following the movements of the blade. The lever 32 is fulcrumed at its front end upon a post 34 rising from the beam 20 and a latch 35 of the usual form is provided upon the lever to cooperate with a holding rack 36 to maintain the lever in a set position. The rack 36 passes through a loop or guide 37 upon the side of the lever 32 and is pivoted at its lower end to a lug 38 upon the beam 20 so that some slight play of the rack will be permitted so as to avoid binding of the parts, but this play is so limited that it will

not permit separation of the parts or premature release of the hand lever.

I also provide a rolling support for the rear end of the blade. This rolling support includes a roller or wheel 40 which is revolvably mounted upon a pin or stud 41 projecting laterally from the lower arm 42 of a lever 43 which is pivotally attached to a bracket or arm 44 concentric with a rack 45 formed upon the rear edge of said bracket. The lever 43 is equipped with a latch 46 adapted to cooperate with the rack 45 whereby to hold the wheel or roller 40 at any desired elevation so that the end of the blade will be held at the proper distance from the surface of the ground. The bracket 44 is provided at its front end with a vertically disposed sleeve or eye 47 which is adapted to fit between the arms 8 of any one of the brackets 4 and be held in such position by the cylindrical extremity of the arched member 15 whereby it will be swiveled to the blade and will be permitted to oscillate freely in a horizontal plane so as to always follow the line of draft. It will be readily understood that by properly adjusting the lever 43 the height at which the roller 40 will run may be varied and, consequently, the end of the blade to which the roller is attached will be set closer to or farther from the surface of the ground.

To maintain the main supporting beam 20 in fixed angular relation to the blade when the machine is in use, I provide a removable brace 48 which is constructed at its ends with depending pins or studs adapted to engage respectively in any of the eyes or loops 6 or 7 upon the blade and in any one of openings 50 formed in the top plate of the beam 20. The angular relation of the main beam to the blade will, consequently, be positively maintained while the machine is in use and it may be varied by shifting the brace bar so as to effect engagement between the same and any one of the loops 6 or 7, as will be readily understood.

The more frequent disposition of the working parts of the machine is that shown in Fig. 1 in which the main carrying beam is pivotally connected with the blade at the center of the same and the blade is disposed so that its forward end or cutting point will be at the right of the line of travel, the supporting wheel 40 being arranged at the left end of the blade. In this arrangement of the parts, the brace 48 is engaged in an opening 50 in the beam 20 between the seat standard and the arched portion 33 of the beam and its forward end is engaged in that eye or loop 7 which is close to the end bracket 4. The draft applied to the machine will be transmitted in the direct line of the carrying beam so that side draft of the machine is practically eliminated. When it is desired to vary the angular position of

the blade, the result may be accomplished by shifting the brace bar 48 from one to the other side of the beam, as shown relatively in Figs. 1 and 2. In Fig. 2, it will also be noticed that the brace bar is engaged in an eye or loop 6 nearer the center of the blade so that the blade is not disposed at as sharp an angle to the line of travel as shown in Fig. 1. The angular position of the blade shown in Fig. 2 will be preferred over the position shown in Fig. 1 when the surface of the ground is comparatively soft and easily moved and it is not desired to cut a sharply defined ditch. When the blade is shifted from the position shown in Fig. 1 to a position similar to that shown in Fig. 2, the roller 40 is, of course, shifted from one end of the blade to the opposite end thereof, and to accomplish this result it is necessary merely to lift the terminal of the draft member 15 out of engagement with the sleeve 47 of the bracket 44, whereupon said bracket may be withdrawn from between the arms 8 and carried to the opposite end of the blade and engaged between the arms 8 thereat. It may be desirable at times, as when working upon hillsides, to have the main supporting beam disposed at some point of the blade other than the center thereof, and such a position is shown in Fig. 3, in which the blade is arranged at a sharp angle to the line of travel and the main beam is arranged at the right end of the blade, the brace bar 48 being correspondingly shifted and the roller 40 being disposed at the rear left end of the blade. When the machine is to be moved from one point of use to another point of use, the roller 40 and the caster 29 may be shifted to their lowest positions, whereupon the blade will be supported in such position that its lower edge will not strike the ground and, consequently, the machine may be driven over a finished road without disturbing the same, the weight of the machine being borne by the roller 40, the caster 29 and the rear wheel or colter 26.

From the foregoing description, it will be seen that I have provided a machine in which the angular position of the blade may be very easily varied. When the blade is set for use, the parts will be as rigid and firm in operation as though positively bolted together. When the particular work in hand has been completed and it is desired to store the machine or transport it to another point of use, it may be very easily disassembled by one man. The brace bar 48 may be easily lifted from its engagement with the eyes or openings in which it is set, and ordinarily the ends of this brace bar will remain in their working positions without the use of cotter pins or other restraining devices. Such devices as will be used, however, will be easily removable so that the brace bar may be quickly detached when the machine is to be

disassembled. In like manner, the draft members 11 and 15 may be detached from the blade and from the main beam 20 and the bracket 44 so that these parts may be readily loaded into a wagon. As the removal of the draft bars will release the bracket 44 and the main beam 20 from the blade, the blade may then be loaded into a wagon, and as my machine is intended more particularly for light work which constitutes the greater part of road grading, the blade may be easily handled by one man. The seat standard 19 may be lifted from the opening 50 in which it is engaged and by removing the pivot pin connecting the standard 31 with the hand lever 32, these parts will be separated so that the caster may be readily placed in the wagon. To further lighten the main beam when necessary, the rear wheel 26 may be removed therefrom and the hand lever as well as the rack 36 may be removed so that the entire work of disassembling the machine may be performed by one man and likewise the machine may be adjusted for use by one man.

Having thus described the invention, what is claimed as new is:

1. A grader comprising a blade, a main supporting beam extending rearwardly from the blade and having a detachable pivotal connection therewith, and a plurality of draft members extending from the blade and having detachable pivotal connection with the same, one of said draft members constituting the connection between the blade and the main supporting beam.

2. A grader comprising a blade, a main supporting beam extending rearwardly from the blade and having detachable pivotal connection therewith, vertically extending loops on the rear side of the blade, and a brace bar having one end detachably engaged with the said beam and its opposite end engaged in one of the loops on the rear side of the blade.

3. A grader comprising a blade having a plurality of brackets on its rear side, each of said brackets being provided with rearwardly projecting arms, a main supporting beam provided at its front end with arms adapted to mate with the arms of any one of said brackets, and a draft member provided with a terminal pivotally engaged in the said mating arms.

4. In a grader, the combination of a blade, a plurality of brackets secured upon the rear side of the blade and provided with rearwardly projecting portions having openings vertically therethrough, draft members having terminals adapted to engage some of said openings, a main supporting beam having its front end adapted to register with any one of said brackets and be held thereto by the draft member engaging the same, rolling supports mounted on said main beam, and a brace bar having one end engaged in one of

the brackets on the blade and its opposite end engaged in the said beam.

5. In a grader, the combination of a blade, a bracket on the rear side of the blade having rearwardly projecting arms, a second bracket having a vertically disposed sleeve adapted to fit between said arms, a draft member pivotally engaging said arms and said sleeve, an angle lever pivotally mounted upon the side of the last-mentioned bracket, a roller carried by said angle lever, a rack on the said bracket, and a latch on the lever adapted to cooperate with said rack.

6. In a grader, the combination of a blade, a main supporting beam having its front end pivotally connected with the rear side of the blade and provided with an arched portion immediately in rear of the pivotal connection, a standard slidably fitted through said arched portion of the beam, a caster carried by the lower end of said standard, a hand lever pivoted to the upper end of said stand-

ard, a post on the beam upon which the said lever is fulcrumed, a rack rising from the beam, and a latch mounted upon the lever to engage said rack.

7. In a grader, the combination of a blade, brackets secured on the rear side of the blade at the center and ends of the same, a draft bar passing over the blade and having a terminal pivotally engaged in the bracket at the center of the same, said bar having a horizontally forked portion in advance of the blade, an arcuate draft beam passing through the forked portion of the draft bar and having its ends passing over the blade and pivotally engaged in the brackets at the ends thereof, the draft having a plurality of vertical openings therethrough, and a locking pin engageable through the draft bar and in one of said openings.

In testimony whereof I affix my signature.

GEORGE E. KETCHUM. [L.S.]