L. S. HACKNEY.

GRADER ATTACHMENT FOR TRACTION VEHICLES.

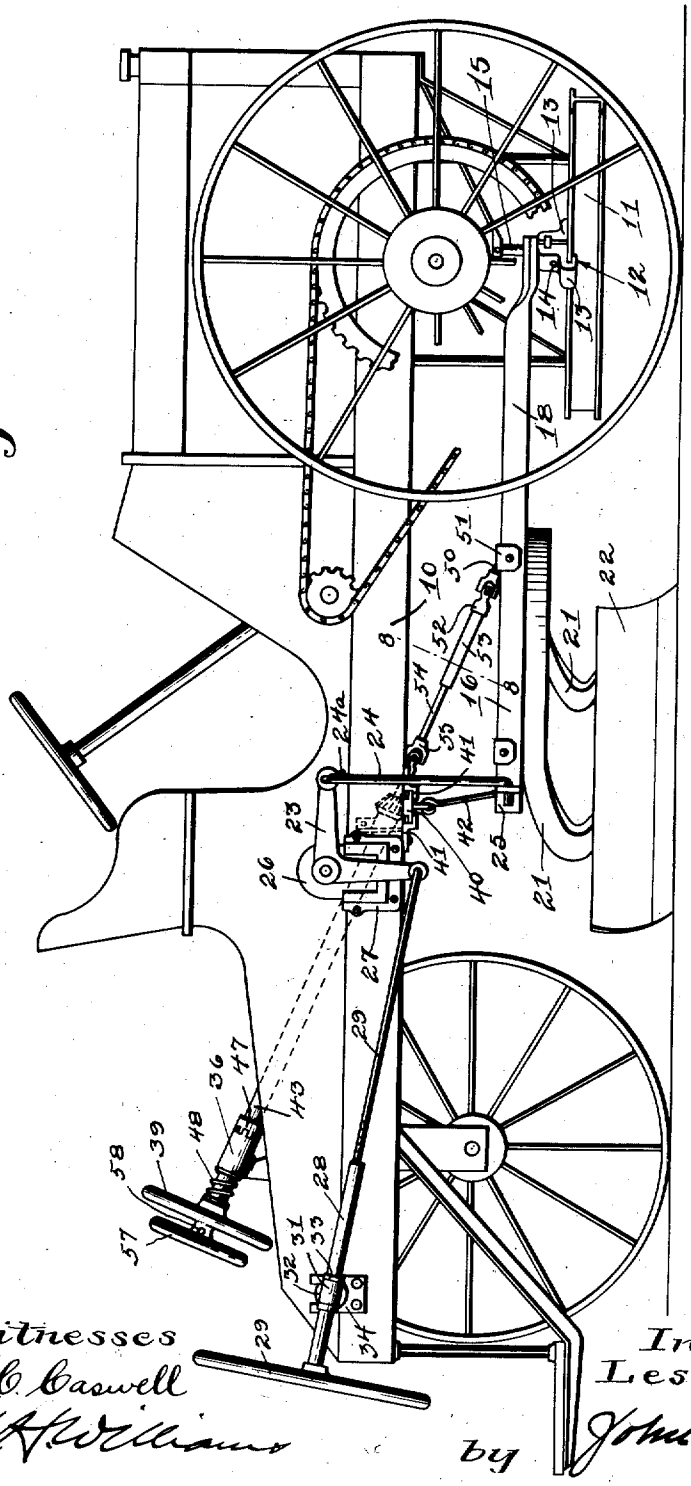
APPLICATION FILED SEPT. 23, 1911.

1,031,063.

Patented July 2, 1912.

2 SHEETS—SHEET 1.

Fig. 1



Witnesses
F. C. Caswell
W. A. Williams

Inventor
Leslie S. Hackney
by John B. Stephens Atty

L. S. HACKNEY.

GRADER ATTACHMENT FOR TRACTION VEHICLES.

APPLICATION FILED SEPT. 23, 1911.

1,031,063.

Patented July 2, 1912.

2 SHEETS—SHEET 2.

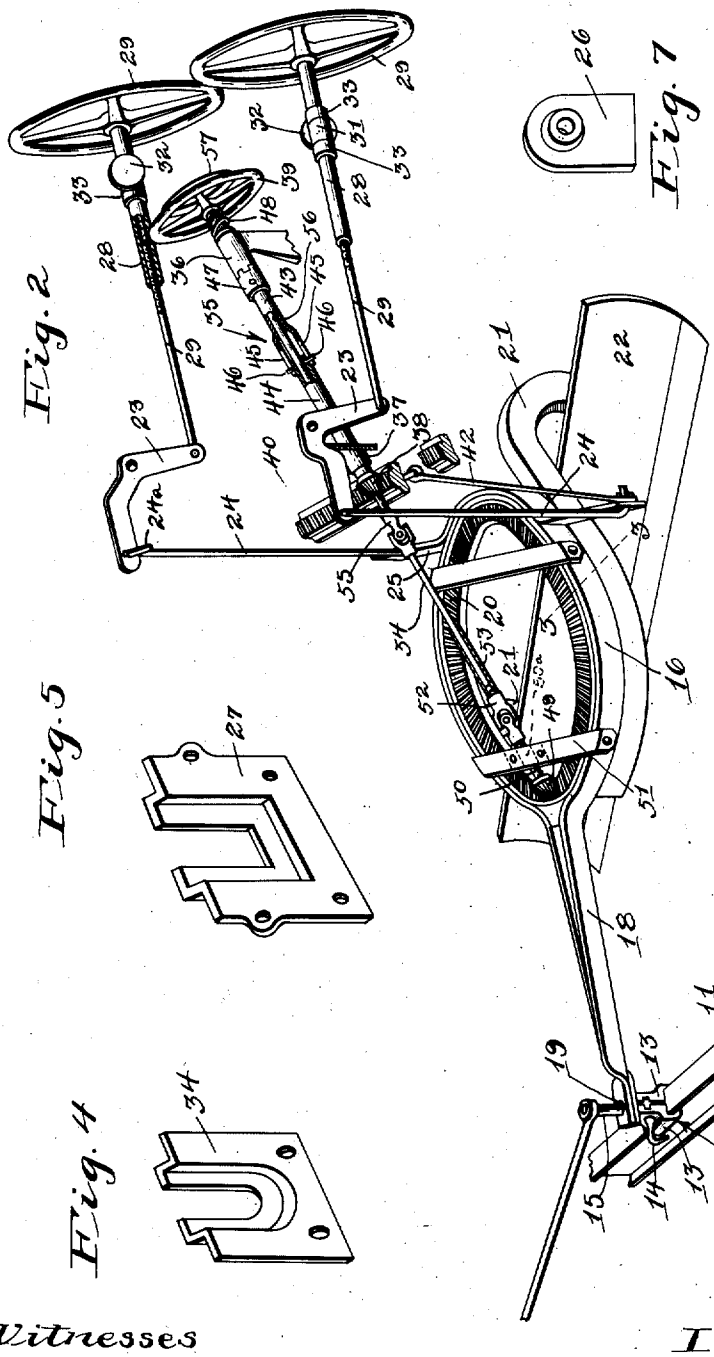


Fig. 2

UNITED STATES PATENT OFFICE.

LESLIE S. HACKNEY, OF ST. PAUL, MINNESOTA.

GRADER ATTACHMENT FOR TRACTION-VEHICLES.

1,031,063. Specification of Letters Patent. Patented July 2, 1912.

Application filed September 23, 1911. Serial No. 650,976.

To all whom it may concern:

Be it known that I, LESLIE S. HACKNEY, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented new and useful Improvements in Grader Attachments for Traction-Vehicles, of which the following is a specification.

My invention relates to improvements in grader attachments for traction vehicles.

The object of my invention is to provide a simple and efficient grader attachment for use in connection with traction vehicles. It is designed to be attached beneath the body of such vehicles and is particularly, though not exclusively, adapted for use with that type of tractors which are mounted with a single steering wheel at the rear.

In the drawings, Figure 1 is a side elevation of my improved grader attachment shown in use with a traction vehicle; Fig. 2 is a detail perspective view of the same; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2; Figs. 4, 5, 6, and 7 are detail perspective views of parts of my attachment, and Fig. 8 is a sectional view in detail taken on the line 8—8 of Fig. 1.

Referring to the accompanying drawings, I have used the reference numerals 10 and 11 to indicate respectively the frame and draw bar of a traction vehicle. The clamp 12 adjustable on the draw bar 11 and detachable therefrom, consists of jaws 13, the hand operated bolt 14 and the king bolt 15. The jaws 13 are formed and placed so as to grip both the drawbar 11 and king bolt 15. By one manipulation of the bolt 14 the jaws 13 are secured to the draw bar 11 and the king bolt 15 is fixed in said jaws while the opposite turn of said bolt opens the jaws and permits the clamp to be moved on or detached from said draw bar. The supporting collar 16 having at its base an annular flange 17 is formed of a single bar of iron, its united ends extending forward to form a tongue 18. This tongue has a perforation 19 to freely receive the king bolt 15, said perforation being sufficiently large to permit a vertical and tilting movement of the collar 16. The internal bevel gear 20 is mounted on the flange 17 and is revoluble within the collar 16. Beams 21 which are formed on this gear support the grader blade 22. The supporting collar 16 is suspended from the bell cranks 23 by the rods 24 which are connected at their upper ends to said cranks by the hooks 24^a and are pivotally connected at their lower ends to the supporting yoke 25, fixed on said collar. These cranks 23 are pivotally supported by the blocks 26, said blocks being detachably socketed in the brackets 27 which are fixed to the frame of the traction vehicle. I have provided the following mechanism for operating said cranks to raise and tilt the supporting collar 16. The threaded sleeves 28 are provided with hand wheels 29 which when rotated operate the cranks 23 through the rods 29. These rods 29 are threaded at one end in said sleeves 28 and pivotally connected at their other ends to said cranks 23. It is necessary that these sleeves be pivotally mounted and secured from longitudinal movement. This is accomplished by the use of the compound bearings 30, each comprising a journal box 31 and a disk journal 32. The disk journals 32 are supported rotatably and detachably in the half bearings 34 which are fixed to the frame of the vehicle. The sleeves 28 are journaled in the boxes 31 and prevented from longitudinal movement therein by the collars 33 on said sleeves.

The blade supporting collar 16 is shifted sidewise as follows: The sleeve 35 is mounted in the bearings 36 and 37 on the frame 10 and is provided at its lower end with a bevel gear 38 and at its upper end with a hand wheel 39. The gear 38 meshes with the rack 40 which is slidably mounted in and detachable from the guides 41 on the frame of the traction vehicle. The connecting rod 42 is pivoted to this rack at one end and to the supporting yoke 25 at its other. By this connection the collar 16 is shifted laterally when the rack 40 is moved by the manipulation of the wheel 39. It is thus obvious that I have provided means whereby the grader blade may be tilted vertically and shifted in a horizontal plane. I have also provided locking means for the sleeve 35 to prevent shifting of the supporting collar 16 except by the manipulation of the hand wheel 39. The sleeve 35 is formed with up-

per and lower members 43 and 44. The upper member 43 is expanded to telescope over the member 44 and has slots 45 to receive the pins 46 in said member 44. The notched collar 47 on the upper member 43 is provided with lugs and is yieldingly held by the spring 48 in engagement with the notched bearing 36. This collar and bearing form a clutch which the spring 48 automatically locks to prevent the shifting of the collar 16 until said clutch is released by downward movement of the member 43, caused by pressure on the hand wheel 49 against the action of the spring 48.

The bevel gear 20 is rotated within the collar 16 to turn the grader blade 22, as follows: The gear 49 in mesh with the bevel gear 20 is mounted on the shaft 50 which is revolubly supported in the bearing 50^a on the truss bar 51. This shaft 50 is connected through a universal joint 52 to the sleeve 53, which is adapted to receive the shaft 54; said sleeve 53 and shaft 54 being square in cross section. The shaft 54 is connected through the universal joint 55 to the shaft 56 mounted in the sleeve 35. The hand wheel 57 is arranged on the shaft 56 and is secured thereto by the removable pin 58. The shaft 54 is adapted to slide within the sleeve 53 and transmits the movement of the hand wheel 57 to the bevel gear 49 to turn the grader blade 22.

In operation the supporting collar 16 may be elevated or tilted or both by manipulating the hand wheels 29. The grader blade 22 is turned by the movement of the hand wheel 57, and the collar 16 is shifted sidewise by first bearing down on the wheel 39 to disengage the notched collar 47 from the bearing 36 and then rotating said wheel.

To disconnect the grader from the traction vehicle the lower end of the connecting rod 42 is withdrawn from the yoke 25, when the collar 16 together with the grader blade 22 and its elevating and tilting mechanism may be removed from the traction vehicle by first loosening the clamp 12 from the draw bar 11 and then lifting the blocks 26 from the brackets 27 and the disk journals 32 from the boxes 34. The rack 40 is removed from the guides 41 by manipulating the wheel 39, and the shaft 56 with the connected shaft 54 is removed from the sleeve 35 by withdrawing the pin 58 and detaching the hand wheel 57.

What I claim as new and desire to protect by Letters Patent is:

1. In a device of the class described the combination with a traction vehicle of a grader blade, a supporting collar for said blade, a clamp capable of horizontal adjustment and detachable from the frame of said vehicle, a king bolt supported by said clamp, a tongue connected at one end by a joint to said bolt and at the other end to the collar and means for elevating and tilting said collar.

2. In a device of the class described the combination with a traction vehicle of a girder blade connected to said vehicle, means for supporting the blade, means for turning said blade, a rack slidably mounted on the frame, connecting means between said rack and blade, a lower sleeve member revolubly mounted on the vehicle, a gear on said sleeve in mesh with said rack, a slotted upper sleeve member telescopically mounted on the lower sleeve member, pins in said lower member extending through the slots of the upper member, a notched bearing on the vehicle for said last mentioned member, a notched collar on said member, a hand wheel mounted thereon, a spring between the notched bearing and said hand wheel for normally engaging the collar and bearing to prevent rotation of said sleeve members.

3. In a device of the class described, the combination with a traction vehicle of the grader blade connected to said vehicle and adapted to turn in a horizontal plane, means for supporting said blade, a rack slidable upon the frame of the vehicle, a gear in mesh with said rack, a revoluble sleeve provided with a hand wheel for rotating said gear, means for locking said sleeve, a shaft supported in said sleeve and provided with a hand wheel, and means in connection with said shaft for turning said grader blade.

4. In a device of the class described the combination with a traction vehicle of a grader blade, a supporting collar for the blade, a tongue on the collar connected to the frame of the vehicle, bell cranks detachably mounted on said vehicle, supporting rods connecting said cranks and collar, bearings on the frame of the vehicle, compound bearings each comprising a journal box and a disk journal, said disk journals being revoluble in and detachable from said first mentioned bearings, internally threaded sleeves journaled in said journal boxes, means for preventing longitudinal movement of said sleeves in said boxes, threaded rods in said sleeves in pivotal connection with said cranks and hand operating wheels for rotating the sleeves whereby said cranks are moved to elevate and tilt said collar.

5. In a device of the class described, the combination with a traction vehicle of a grader blade connected to said vehicle and adapted to turn in a horizontal plane, means for supporting said blade, a rack movably mounted on the frame of the vehicle, a gear in mesh with said rack, a revoluble sleeve comprising two members telescopically connected and provided with a hand

wheel for rotating said gear, means for locking one of said sleeve members to prevent rotation of said sleeve, a shaft revolubly mounted in said sleeve and provided a hand wheel, and means in connection with said shaft for turning said girder blade.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

LESLIE S. HACKNEY.

Witnesses:
ASHLEY COFFMAN,
C. N. FRENCH.

Correction in Letters Patent No. 1,031,063.

It is hereby certified that in Letters Patent No. 1,031,063, granted July 2, 1912, upon the application of Leslie S. Hackney, of St. Paul, Minnesota, for an improvement in "Grader Attachments for Traction-Vehicles," an error appears in the printed specification requiring correction as follows: Page 2, line 69, and page 3, line 6, for the word "girder" read *grader;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 13th day of August, A. D., 1912.

[SEAL.]

E. B. MOORE,
Commissioner of Patents.

wheel for rotating said gear, means for locking one of said sleeve members to prevent rotation of said sleeve, a shaft revolubly mounted in said sleeve and provided a hand wheel, and means in connection with said shaft for turning said girder blade.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

LESLIE S. HACKNEY.

Witnesses:
ASHLEY COFFMAN,
C. N. FRENCH.

Correction in Letters Patent No. 1,031,063.

It is hereby certified that in Letters Patent No. 1,031,063, granted July 2, 1912, upon the application of Leslie S. Hackney, of St. Paul, Minnesota, for an improvement in "Grader Attachments for Traction-Vehicles," an error appears in the printed specification requiring correction as follows: Page 2, line 69, and page 3, line 6, for the word "girder" read *grader;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 13th day of August, A. D., 1912.

[SEAL.]

E. B. MOORE,
Commissioner of Patents.