

W. S. LIVENGOOD.

ROAD GRADER.

APPLICATION FILED JUNE 18, 1908.

Patented Jan. 4, 1910.

3 SHEETS—SHEET 1.

945,179.

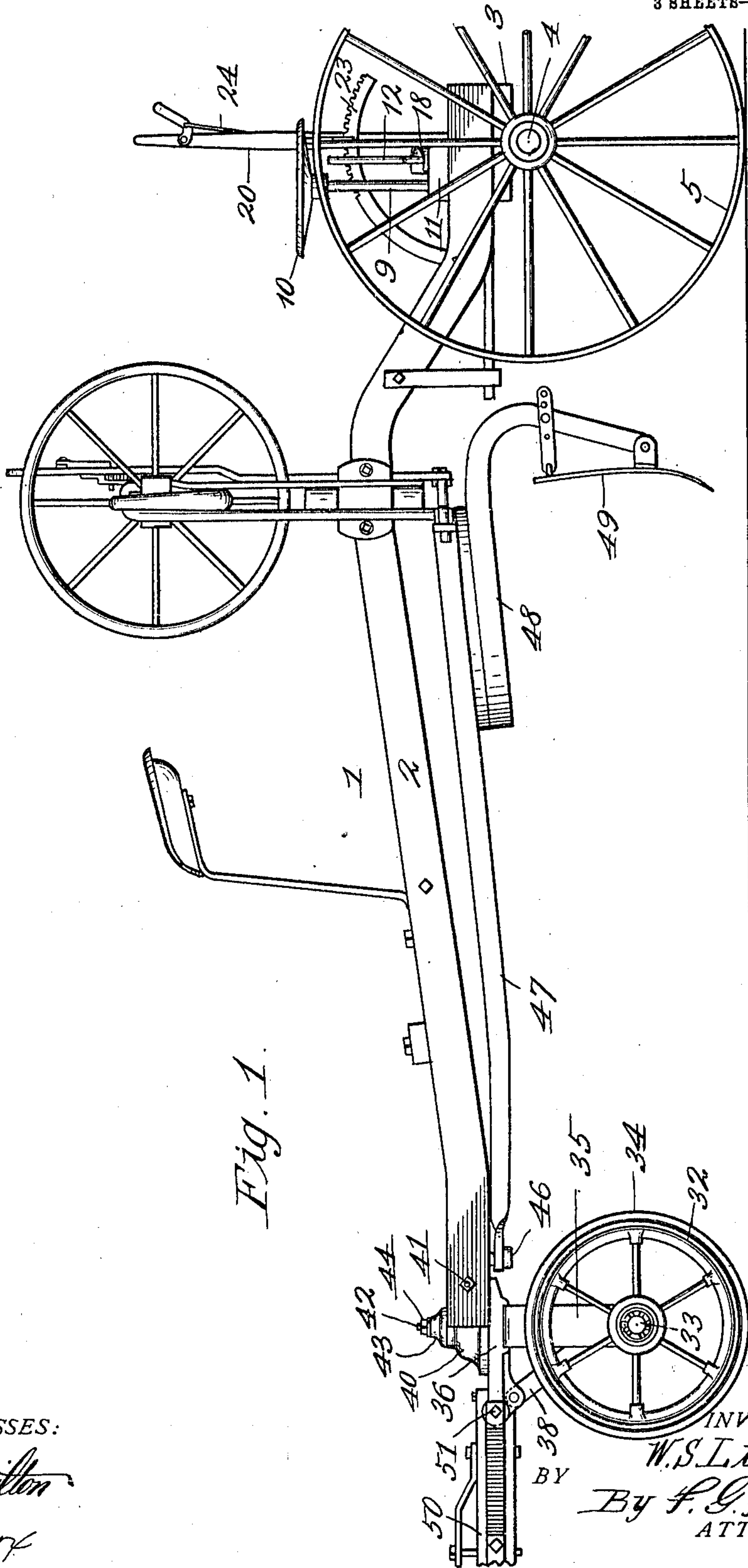


Fig. 1.

WITNESSES:

*R. Hamilton*  
*M. Cox*

INVENTOR.

*W. S. Livengood,*

BY *F. G. Fischer,*  
ATTORNEY.





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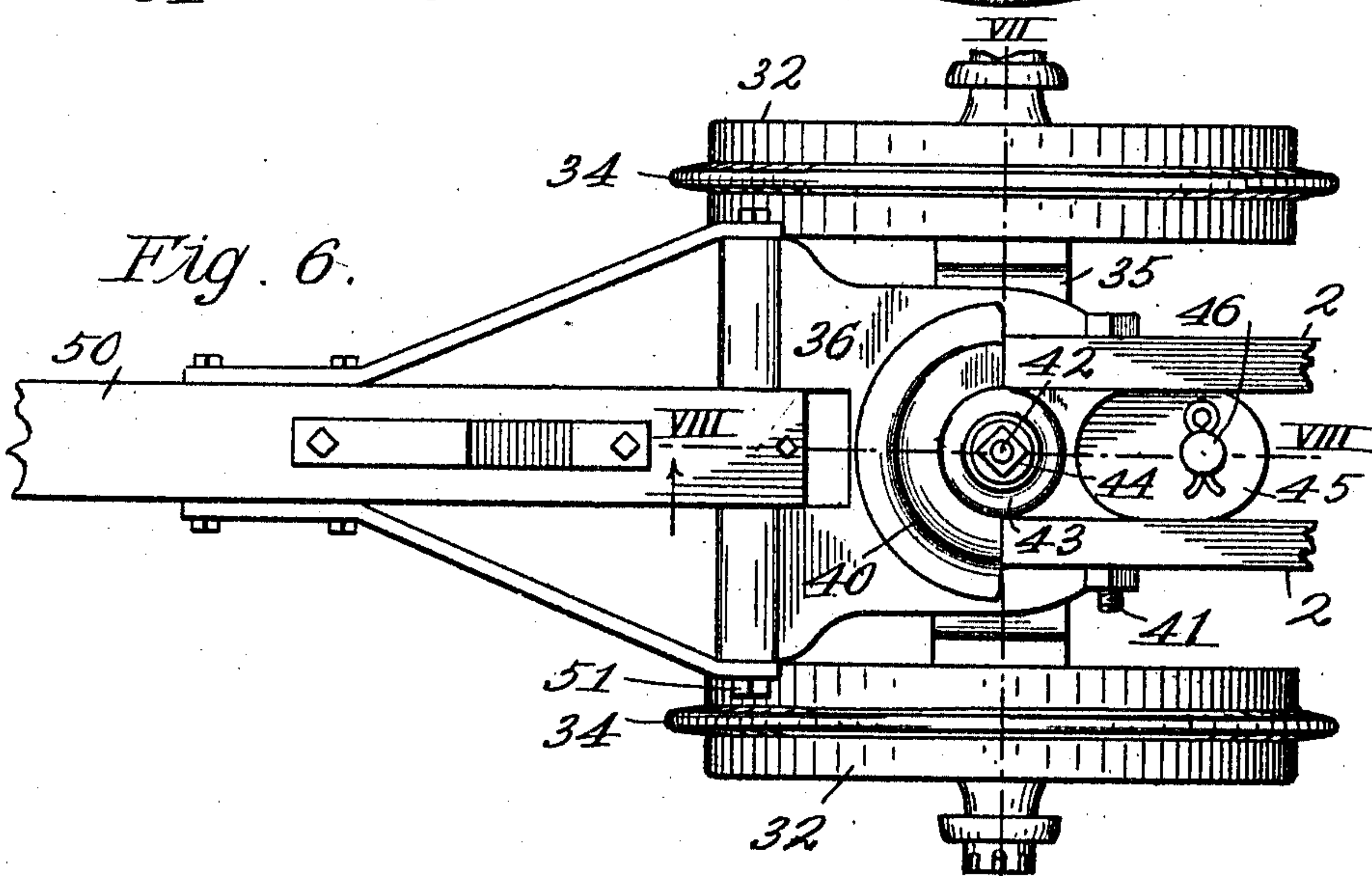
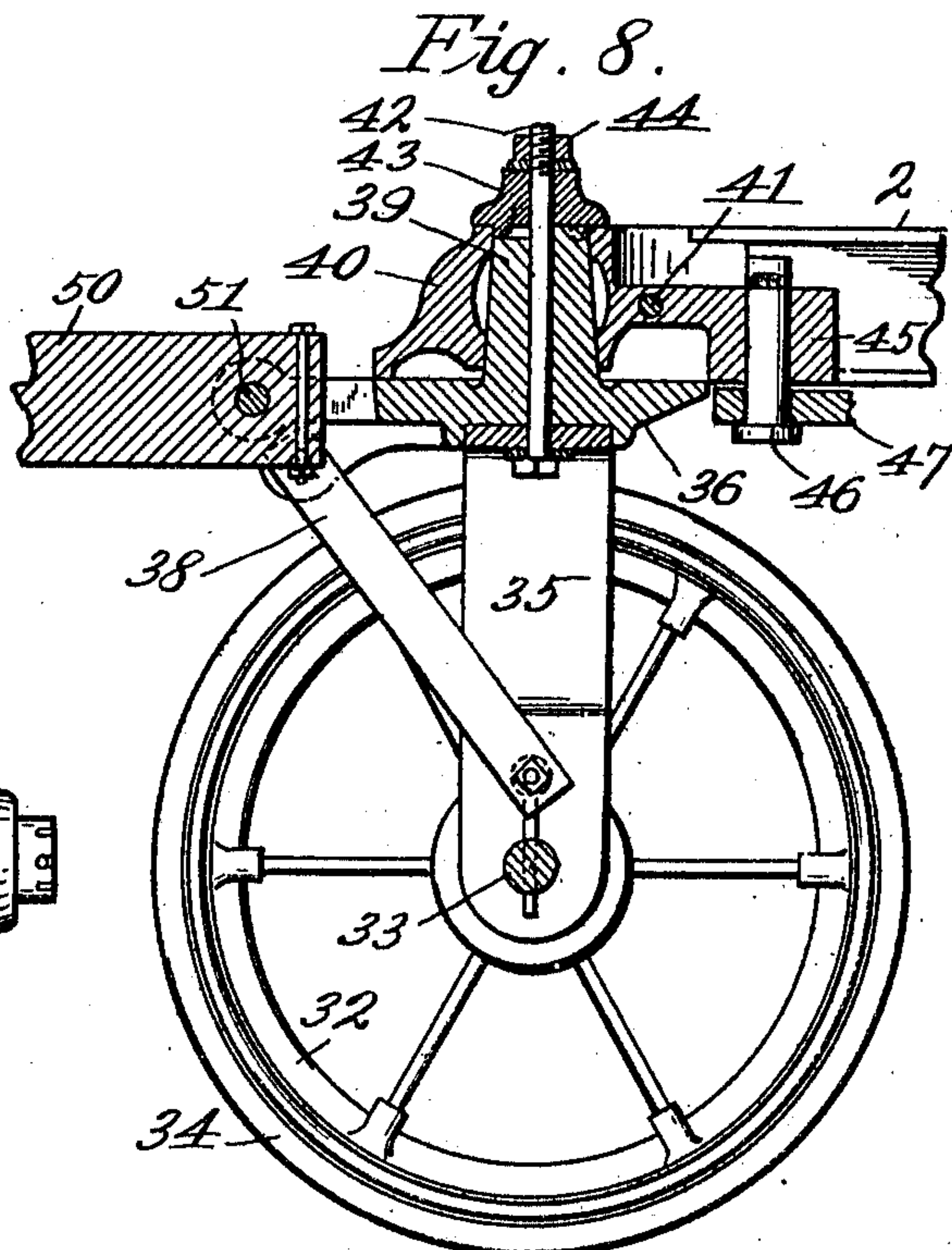
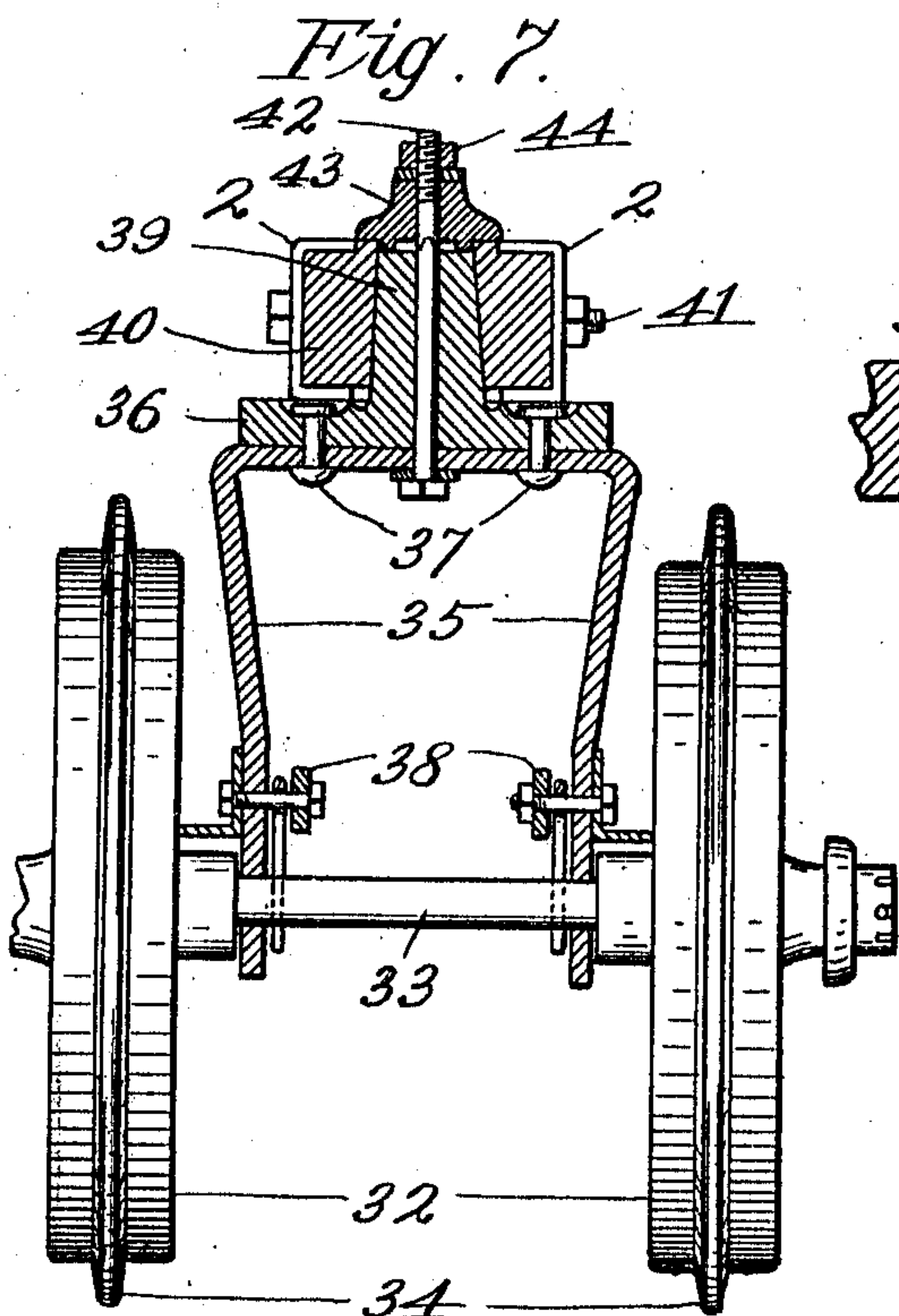
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ATTORNEY.



# UNITED STATES PATENT OFFICE.

WINFIELD S. LIVENGGOOD, OF KANSAS CITY, MISSOURI, ASSIGNOR TO SMITH & SONS  
MFG. CO., OF KANSAS CITY, MISSOURI.

## ROAD-GRADER.

945,179.

Specification of Letters Patent.

Patented Jan. 4, 1910.

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*To all whom it may concern:*

Be it known that I, WINFIELD S. LIVENGGOOD, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Road-Graders, of which the following is a specification.

My invention relates to improvements in road-graders; and one of my objects is to provide novel means for adjusting the rear axle of the grader transversely and obliquely to the line of draft.

A further object is to provide novel means upon which to mount the front end of the grader-frame.

In order that the invention may be fully understood, reference will now be made to the accompanying drawings, in which:

Figure 1 represents a side elevation of a road-grader provided with my improvements. Fig. 2 is a plan view of the rear wheels and the rear axle of the grader with the means for adjusting said axle in horizontal section taken on the plane of line II—II of Fig. 3. Fig. 3 is a detail side elevation of the means for adjusting the axle obliquely to the line of draft. Fig. 4 is a vertical section on line IV—IV of Fig. 2, showing the means for adjusting the rear axle transversely to the line of draft. Fig. 5 is a broken vertical section on line V—V of Fig. 3. Fig. 6 is a plan view of the means for carrying the front end of the grader-frame. Figs. 7 and 8 are vertical sections on line VII—VII and VIII—VIII, respectively, of Fig. 6.

1 designates the grader-frame, which consists of a pair of channel-bars 2 and a rear bolster 3 connecting the rear ends of said channel-bars. Bolster 3 rests upon a rear axle 4 upon which a pair of wheels 5 are mounted. Axle 4 is adjusted transversely to the line of draft by means of a rack-bar 6 and a pinion 7. Rack-bar 6 is connected to the undersides of the enlarged ends 8 of the axle, while pinion 7 is fixed upon the lower end of a shaft 9, which is provided at its upper end with a combined hand-wheel and seat 10 whereby the pinion and shaft may be rotated and which forms a convenient seat for the operator to rest upon after the axle has been adjusted. Shaft 9 is journaled in bolster 3 and a transverse bar 11 secured to the top of the channel-bars 2.

Pinion 7 is secured from accidental rota-

tion by a latch-rod 12 extending down through bar 11, bolster 3, and a link 13, so that its lower terminal may enter a space between two teeth of the pinion and thus lock the same. Rod 12 is normally held in engagement with the pinion by an expansion spring 14 bearing against the underside of bar 11 and the upper side of a collar 15 secured to the rod. The upper portion of rod 12 has an offset 16 engaging the inclined surface 17 of a casting 18 secured to bar 11. By turning the rod to the dotted position shown in Fig. 4, the offset 16 will be caused to slide upward on the inclined surface 17 until the lower terminal of the rod is lifted out of engagement with the pinion so that the same may be rotated to adjust the axle longitudinally.

Axle 4 is adjusted obliquely to the line of draft, as indicated by dotted lines, Fig. 2, by a clutch 19 and a hand-lever 20, which latter is pivotally connected to frame 1 by a bolt 21 and pivotally connected to clutch 19 by a bolt 22. The lever 20 is locked from accidental movement by a notched sector 23 secured to frame 1, and a latch-rod 24 carried by the lever and adapted to engage any of the notches in the sector. Clutch 19 loosely engages the rear axle so that the latter may be adjusted longitudinally, and in order that the sides of its notched portion 25 may bear squarely against the front and rear sides of the axle while adjusting the same obliquely to the line of draft, I support the ends of said clutch by a pair of parallel straps 26 pivotally secured to the clutch and frame 1, as clearly shown in Fig. 3.

27 designates a pair of rollers at each end of the bolster for limiting the pivotal movement of the axle. Said rollers are spaced in front and in the rear of the axle and are journaled upon bolts 28 extending through the bolster and a pair of links 29 extending beneath the axle. The axle has its pivotal movement upon a roller 30 mounted upon a bolt 31 extending downward through bolster 3 and link 13.

32 designates a pair of wheels for carrying the front end of the grader. Said wheels are journaled upon an axle 33 and provided with peripheral flanges 34, which sink into the soil and thus prevent the wheels from slipping sidewise. Axle 33 is mounted in the lower ends of a yoke 35, to the upper end of which a member 36 is rigidly secured



by rivets 37. Member 36 is further secured to the yoke by a pair of braces 38 and is provided with a hub 39 which extends upwardly through a stationary member 40, rigidly secured to the forward ends of channel-bars 2 by a bolt 41. Member 40 is held in position on member 26 by a king-bolt 42, a washer 43, and a retaining-nut 44, which latter engages the upper threaded end of the king-bolt. Member 40 is provided with a rearward extension 45, carrying a linch-pin 46 to which the forward ends of the scraper-blade pull-bars 47 are secured. Pull-bars 47 are secured to the customary frame 48, carrying the customary scraper-blade 49.

50 designates a tongue pivotally secured to the forward end of member 36 by a transverse pin 51, for the purpose of guiding the grader and forming a convenient means to which the team may be hitched.

Having thus described my invention, what I claim is:—

1. In a machine of the character described, a rear axle pivotally mounted in the frame thereof, a clutch engaging said axle, a pair of parallel straps pivoted to the frame and said clutch, and means for actuating the clutch to control the pivotal movement of the axle.

2. In a machine of the character described, a rear axle pivotally mounted in the frame thereof, a clutch engaging said axle, a pair of parallel straps pivoted to the frame and said clutch, and a hand-lever pivoted to the frame and the clutch for controlling the pivotal movement of the axle.

3. In a machine of the character described, a bolster forming part of the frame thereof, a rear axle pivotally and slidably mounted on said bolster, a pair of rollers at each end of the bolster, spaced from the front and rear sides of the axle, an intermediate roller on the bolster bearing against the rear side of the axle, means for controlling the sliding movement of the axle, and means for controlling the pivotal movement of said axle.

4. In a machine of the character described, a bolster forming part of the frame thereof, a rear axle pivotally and slidably mounted on said bolster, a pair of rollers at each end of the bolster, spaced from the front and rear sides of the axle, an intermediate roller on the bolster bearing against the rear side of the axle, a rack-bar secured to the axle, a pinion intermeshing with said rack-bar, means for rotating said pinion to adjust the axle longitudinally, and means carried by the frame for controlling the pivotal movement of the axle.

5. In a machine of the character described, a bolster forming part of the frame thereof, a rear axle pivotally and slidably mounted on said bolster, a pair of rollers at each end of the bolster, spaced from the front and

rear sides of the axle, an intermediate roller on the bolster bearing against the rear side of the axle, a rack-bar secured to the axle, a pinion intermeshing with said rack-bar, means for rotating said pinion to adjust the axle longitudinally, a spring-actuated rod to lock the pinion from accidental rotation, and means carried by the frame for controlling the pivotal movement of the axle.

6. In a machine of the character described, a bolster forming part of the frame thereof, a rear axle pivotally and slidably mounted on said bolster, a pair of rollers at each end of the bolster, spaced from the front and rear sides of the axle, an intermediate roller on the bolster bearing against the rear side of the axle, a rack-bar secured to the axle, a pinion intermeshing with said rack-bar, a shaft on which said pinion is mounted, a combination hand-wheel and seat for rotating said shaft, and means carried by the frame for controlling the pivotal movement of the axle.

7. In a machine of the character described, a bolster forming part of the frame thereof, a rear axle pivotally and slidably mounted on said bolster, a pair of rollers at each end of the bolster, spaced from the front and rear sides of the axle, an intermediate roller on the bolster bearing against the rear side of the axle, means for controlling the sliding movement of the axle, a clutch engaging the axle, and means connected to said clutch for controlling the pivotal movement of the axle.

8. In a machine of the character described, a bolster forming part of the frame thereof, a rear axle pivotally and slidably mounted on said bolster, a pair of rollers at each end of the bolster, spaced from the front and rear sides of the axle, an intermediate roller on the bolster bearing against the rear side of the axle, means for controlling the sliding movement of the axle, a clutch engaging the axle, and a lever pivotally connected to said clutch for controlling the pivotal movement of the axle.

9. In a machine of the character described, means for supporting the front end thereof consisting of a stationary member rigidly secured to the machine frame and provided with a rearward extension, a pin extending through said extension to which the scraper-blade pull-bars of the machine are pivotally secured, a pivoted member mounted in said stationary member, a yoke depending from said pivoted member, an axle extending through said yoke, and a pair of wheels mounted on said axle.

In testimony whereof I affix my signature, in the presence of two witnesses.

WINFIELD S. LIVENGOD.

Witnesses:

F. G. FISCHER,  
M. Cox.