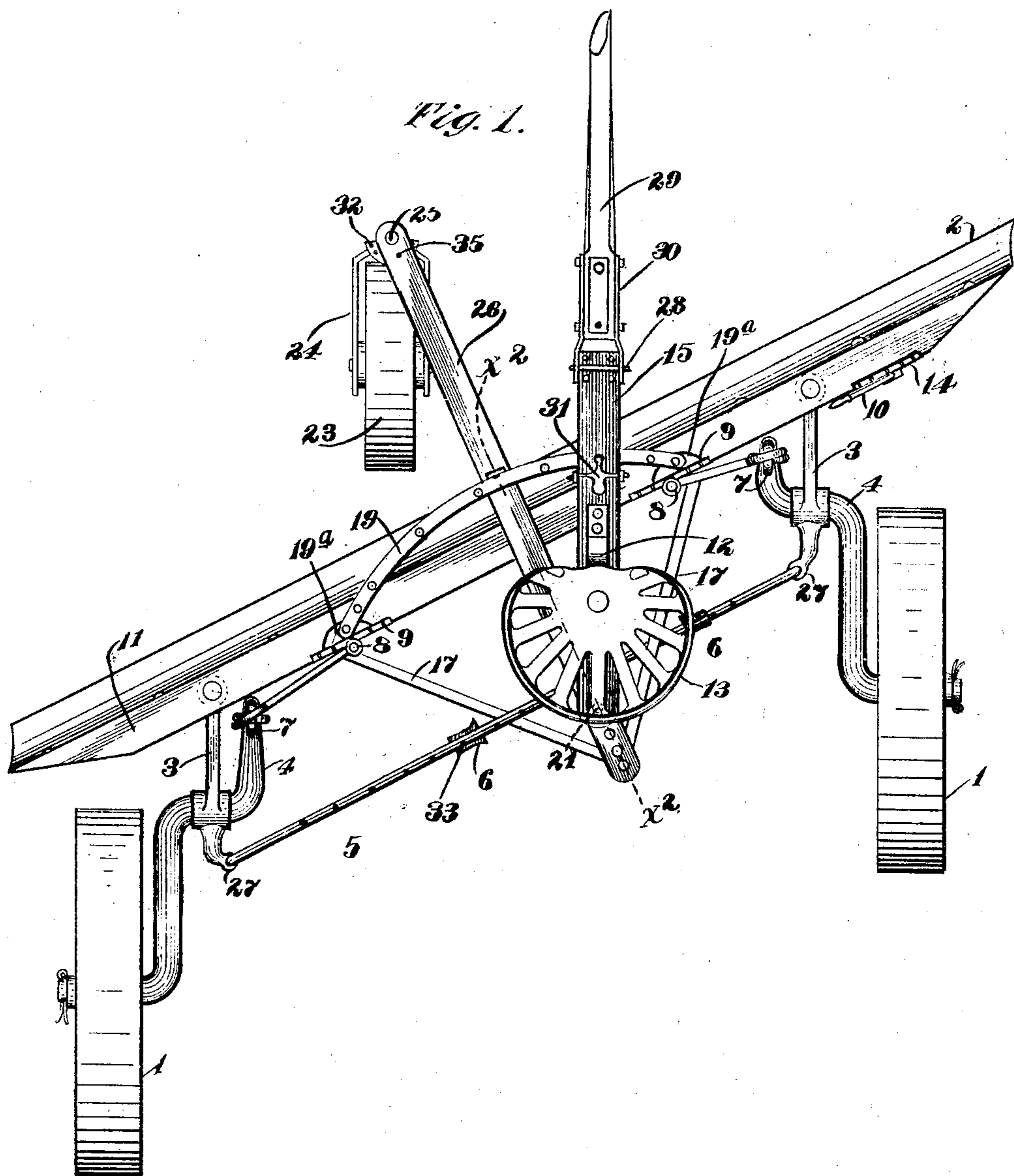


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ROAD GRADING MACHINE.  
APPLICATION FILED JAN. 11, 1907.

924,966.

Patented June 15, 1909.  
3 SHEETS—SHEET 1.



*Witnesses:*  
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*Inventor:*  
*Harry K. Clemons*  
*By His Attorneys:*  
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3 SHEETS—SHEET 2.

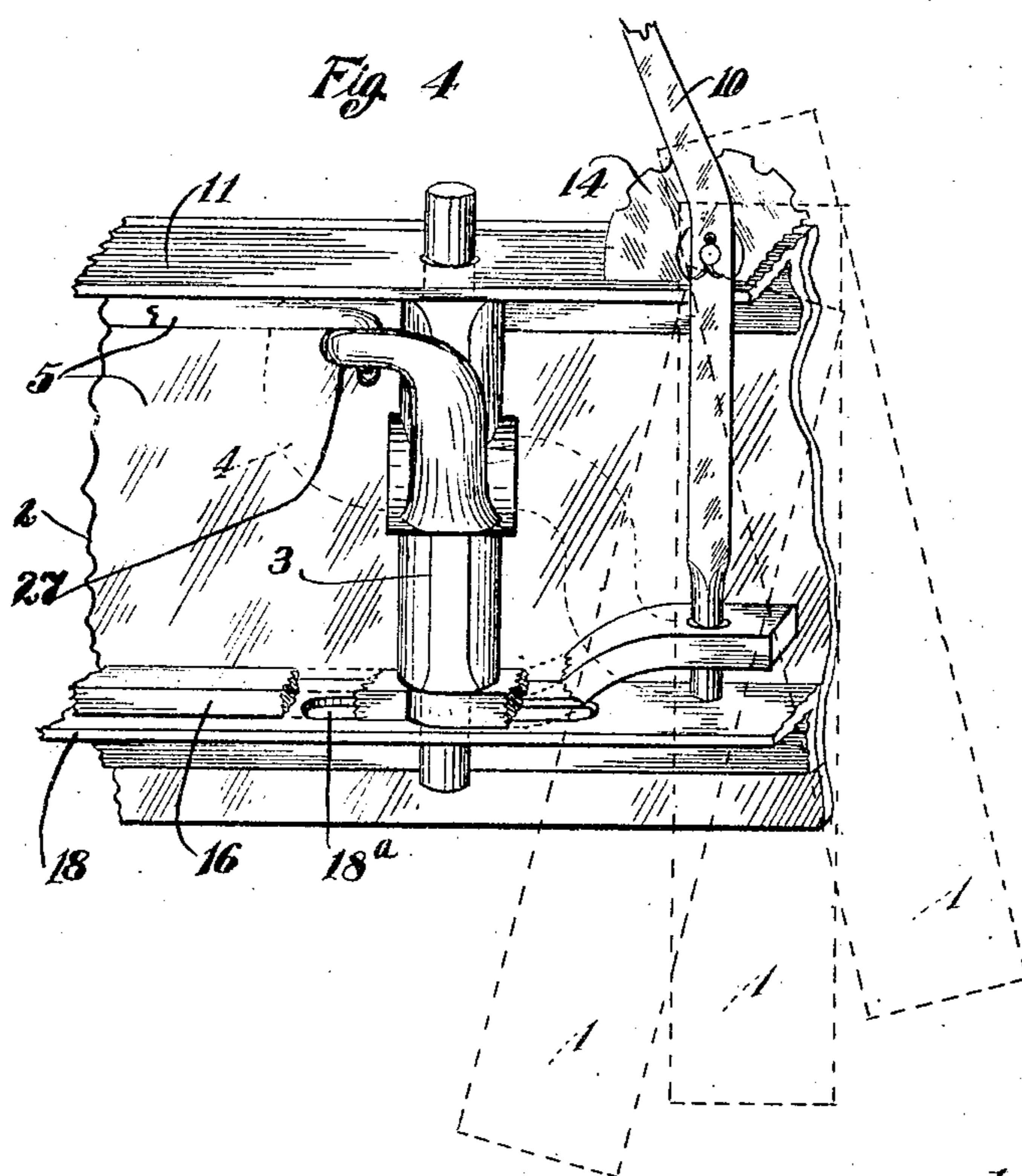
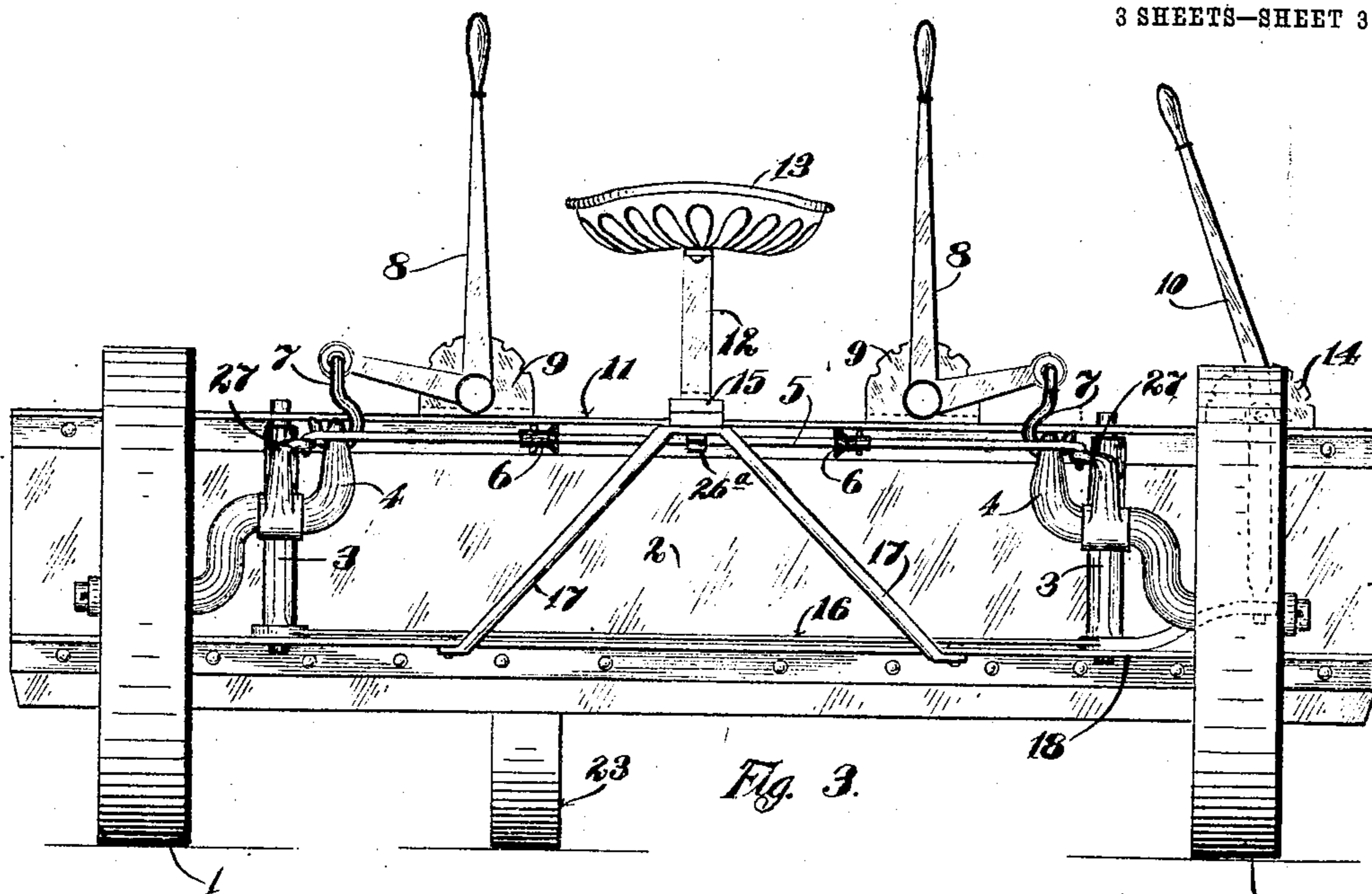
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# UNITED STATES PATENT OFFICE.

HARRY K. CLEMONS, OF ST. PAUL, MINNESOTA.

## ROAD-GRADING MACHINE.

No. 924,966.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed January 11, 1907. Serial No. 351,812.

*To all whom it may concern:*

Be it known that I, HARRY K. CLEMONS, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Road-Grading Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improved road grading machine, and to this end, it consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Referring to the drawings: Figure 1 is a plan view of the road grading machine. Fig. 2 is a view principally in vertical section taken on the line  $x^2 x^2$  of Fig. 1; but with some parts shown in full, other parts broken away and sectioned. Fig. 3 is a rear elevation of the improved machine; and Fig. 4 is a fragmentary view in perspective, illustrating on a larger scale than in the other views, the means for imparting angular adjustment to the wheels, the said parts being viewed from the rear.

The scraper blade 2 which is of the ordinary construction, is provided at its upper edge with a reinforcing flange preferably formed by an angle bar 11, and on its back, a considerable distance above its lower edge, it is provided with another flange in the form of an angle bar 18, both of which bars 11 and 18 extend from end to end of the blade 2. A beam 26 is connected by a loose joint 11<sup>a</sup> to the central portion of the upper flange of the angle bar 11, and as shown, extends both forward and rearward thereof at approximately a right angle thereto. At the rear of the scraper blade, is a pair of upright swinging brackets 3 having trunnions at their forward ends, which trunnions at their upper ends are loosely pivoted in the projecting flange of the angle bar 11, and at their lower ends are pivoted in a sliding bar 16 mounted on the projecting flange of the angle bar 18, the said flange being slotted at 18<sup>a</sup> to permit angular adjustments of the lower portions of said brackets 3, as best shown in Fig. 4. An alinement bar 5 which

has hooked ends connected to eyes 27 on the brackets 3, connects the said brackets for parallel swinging movements.

The main wheels 1 are suitably journaled on trunnions located at the rearwardly projecting ends of crank axles 4, that are intermediately journaled in the intermediate portions of the swinging brackets 3; and as shown, are provided with forwardly projecting ends connected by short links 7 to the short lower arms of operating levers 8. These levers 8 are pivotally connected to notched latch segments 9, shown as rigidly secured to the angle bar 11 of the scraper blade. These levers and latch segments serve to hold the crank axles 4 in different independent adjustments. By such adjustments, as is evident, the opposite ends of the scraper blade 2 may be independently raised and lowered, and the blade may be set to scrape either a level surface or a surface inclined in either direction. The forwardly projecting end of the beam 26 is carried by a gage wheel 23 of the caster wheel type, which together with its pronged bracket 24, constitutes a truck serving to support the forward portion of the weight of the machine. As shown, the wheel bracket 24 is provided with a trunnion 25 that is pivotally connected to the beam 26, and it is also provided with a perforated segment 32. By means of the pin 35, it may be inserted through the perforation in the beam 26 and through one or the other of the perforations in the segment 32. The wheel bracket 24, may, when desired, be locked against lateral swinging movements. A draw bar 15 is pivotally connected at its rear end at 21<sup>a</sup> (see Figs. 1 and 2), to the beam 26 forward of the extreme rear end of the latter; and mounted on this bar 15, is a standard 12 that carries an ordinary seat 13. A foot operated latch dog 31 is pivotally mounted on the draw bar 15, and is adapted to engage perforations of a latch bar 19, which as shown, is segmental in form and at its ends, is securely but loosely anchored at 19<sup>a</sup> to the flange of the angle bar 11. The pole 29 is hinged or pivotally connected to the forward end of the draw bar 15, as shown by means of metal straps 30 and a coupling pin 28. A shim or spacing block 34 secured on the beam 26, holds the latch bar 19 in a slightly raised position, as shown in Fig. 2; and a clip or keeper secured to the underside of the draw bar 15, holds the latter down in close engagement

with said latch bar, but permits lateral swinging movements of the said draw bar. It is evident, when the latch dog 31 is stepped on, and its forward end raised, the draw bar 15 and the connected pole may be set at any desired angle in respect to the scraper blade 2, on either side of the beam 26. The pole and draw bar 15 will, of course, always remain in the line of draft, so that adjustments of the same in respect to the latch bar 19 will change the angle of the blade 2 with reference to the line of draft, and permit the blade to be set at the will of the operator, so that it will work the earth continuously in one direction from a single ditch to the center of the grade, while moving in either direction. The end of the sliding bar 16 is pivotally connected to the depending end of a hand lever 10 that is pivotally connected to, and coöperates with a suitable notched latch segment 14, rigidly secured to the angle bar 11 with the blade 2. This lever and latch segment serve to hold the swinging brackets 3 in different angular positions in respect to a vertical line, as best indicated by dotted lines in Fig. 4. Hence, through the mechanism just described, the wheels may be set either in a perpendicular or in oblique positions at the will of the operator. On the so-called alinement bar 5, are stop collars 6 that are adapted to engage the beam 26 and a keeper strap 26\*, see Fig. 2. These stop collars 6 are made adjustable by means of a pin or key 33, that is adapted to be inserted into the perforations therein and through perforations in the said alinement bar 5.

The numeral 17 indicates a V-shaped brace or bracket, the prongs of which, at their forward ends, are securely but loosely connected to the projecting flange of the angle bar 18 of the scraper blade 2; and at its rear end portion, said bracket is adjustably connected to the rear end portion of the beam 26, as shown, by means of a nutted bolt 36 passed therethrough and through one or the other of several perforations 37 in the said beam 26. The beam 26, the scraper blade 2, and the brace 27, form an adjustable triangular structure in which the angle to which the said blade will be set in respect to a vertical line depends on the position in which the rear end of said brace 17 is connected to the rear end of said beam 26. This adjustment is indicated by full and by dotted lines in Fig. 2. At the same time, the said brace 17 serves to hold the scraper blade always in a right angle to the said beam 26.

What I claim and desire to secure by Letters Patent of the United States is as follows:—

1. A road-grading machine, the blade secured to a pair of flanges extending the entire length thereof; said flanges supporting

in a hinge or pivoted manner a pair of depending swinging brackets capable of an oscillating or swinging motion with means for holding said swinging brackets where set substantially as described.

2. In a road-grading machine the combination with a pair of wheels connected to a pair of swinging oscillating brackets pivotally attached to a blade with means for holding said swinging brackets where set substantially as described.

3. In a road-grading machine the combination with a pair of wheels connected with a pair of bell crank axles journaled through a pair of oscillating or swinging arms or brackets, said brackets in turn being pivotally connected to another pair of flanges rigidly attached to a blade with means for raising or lowering the blade and holding same where set, by a connection with the forward ends of said bell crank axles manipulating same upward or downward substantially as described.

4. In a road-grading machine the combination with an alinement bar connecting a pair of swinging brackets and holding said brackets at various angles with reference to the blade of means for holding same where set substantially as described.

5. In a road grading machine, the combination with a scraper blade, of a pair of brackets pivotally connected to said blade, crank axles pivoted to said brackets, and adjustable laterally therewith, wheels journaled on said crank axles, means for adjusting and holding said crank axles in different positions, and means for adjusting said brackets and wheels from perpendicular into oblique angle positions, substantially as described.

6. In a road-grading machine, the combination with a pair of levers 8 engageable in notched segments 9 fulcrumed to pivots 36 engaging to the ends of a pair of bell crank axles, by a pair of links 7, wheels connected with axles 4—axles 4 journaled through brackets 3; said mechanism operating to raise or lower the blade and hold same where set, substantially as described.

7. In a road-grading machine, the combination with a lever 10, engageable with notch segment 14, pivotally connected with flange 11, and slide 16, and capable of moving laterally, slide 16 carrying swinging brackets 3 and wheels 1 connected thereto from a vertical to an oblique angle, and holding the same where set, substantially as described.

8. In a road-grading machine, the combination with an alinement bar 5, capable of changing the angles of the swinging brackets 3, and the wheels 1 attached thereto to any desired angle with reference to the blade and by properly adjusting slides or collars 6 rigidly secure wheels 1 at the various angles with reference to the blade and hold same where set, substantially as described.

9. In a road-grading machine, the combination with lateral braces 17, being capable of adjustment forward or backward on beam 26 at their upper part and secured to blade 2 at their lower parts in such a manner as to admit of blade 2 being tilted or changed to various angles with reference to beam 26 and held where set, substantially as described.

10. In a road-grading machine the combination with a beam secured to the top of flange 11, and extending forward and backward from center of and at an angle with blade 2, a truck wheel pivotally connected with and supporting and carrying the front end of beam 26, with means for changing the angle of said wheel or truck with reference to its line of draft and holding the same where set, substantially as described.

11. In a road-grading machine, the combination with a pole pivotally connected with a draw bar, a draw bar at its rear end pivotally connected to a beam to the rear of blade—the forward end of said bar capable of passing over blade and describing the segment of a circle and forming various angles with reference to the blade thereof, with means of holding said bar where set, substantially as described.

12. In a road-grading machine the combination with a draft bar 15, pivotally connected at its rear end to rear of beam 26, beam 26 supporting segment 19, segment 19 secured to beam 26, and at the ends to flange 11, and bearing on its upper surface the draft bar 15, foot operating dog latch 31 engaging with either of the several perforations bar 15 and segment 19 are provided with, holding same where set, substantially as described.

13. In a road grading machine, a scraper blade, a beam connected to the upper central portion of said scraper blade and projecting rearward thereof, and a brace adjustably connected at its rear portion to the rear portion of said beam, and connected at its forward portion to a lower portion of said scraper blade, the adjustments of said brace on said beam serving to vary the vertical pitch of said blade.

14. In a road grading machine, a scraper blade, a beam connected to the upper central portion of said scraper blade and projecting rearward thereof, said beam having a multiplicity of perforations in its rear end, an approximately V-shaped brace the forwardly projecting prongs of which are attached to a lower portion of said scraper blade on opposite sides of said beam, and a bolt cooperating with the perforations in said beam, to adjustably connect the rear portion of said brace to the rear portion of said beam, the adjustments of said brace on said beam serving to vary the vertical pitch of said scraper blade.

15. In a road grading machine, the combination with a scraper blade, of wheels at the front and rear of said blade, means adjustably supporting said scraper blade from said wheels, a beam secured to the upper central portion of said scraper blade and projecting rearward thereof, and a brace connected to a lower portion of said scraper blade on opposite sides of said beam and adjustably connected at its rear portion to the rear portion of said beam, the adjustments of said brace on said beam serving to vary the vertical pitch of said scraper blade.

16. In a road grading machine, the combination with a scraper blade, of brackets connected to said blade for lateral swinging movements, crank axles connected to said brackets for vertical oscillatory movements, wheels journaled on the rearwardly projecting portions of said crank axles, and independent devices for vertically adjusting said crank axles whereby the opposite ends of said scraper blade may be independently raised and lowered.

17. In a road grading machine, the combination with a scraper blade, of supporting wheels at the front and rear of said blade, crank axles connected to said blade with freedom for both lateral and vertical swinging movements, and to the rear portions of which crank axles, the said rear wheels are journaled, independent devices for vertically adjusting said crank axles, and means holding the said crank axles for parallel lateral swinging movements, substantially as described.

18. In a road grading machine, the combination with a scraper blade, of supporting wheels at the front and rear of the said blade, crank axles connected to said scraper blade for lateral and vertical swinging movements, to the rear portion of which crank axles the rear supporting wheels are journaled, independent devices for vertically adjusting said crank axles, a beam connected to the upper central portion of said scraper blade and projecting rearward thereof, a brace connected to the lower portion of said scraper blade on opposite sides of said beam, and connected at its rear portion to the rear portion of said beam, a draw bar pivotally connected at its rear end to said beam, back of said scraper blade, means for locking said draw bar in different horizontal angular adjustments in respect to said beam and scraper blade, and a pole connected to said draw bar.

19. In a road grading machine, the combination with a scraper blade, of a beam connected to the central upper portion of the said scraper blade and projecting rearward thereof, a brace connected to a lower portion of said scraper blade and to the rear portion of said beam, a draw bar pivotally connected to said beam at the rear of said

scraper blade, and means for securing said draw bar in different horizontal angular adjustments in respect to said beam and to said scraper blade.

- 5 20. In a road grading machine, the combination with a scraper blade and wheels supporting same at the front and rear, of crank axles connected to said scraper blade for horizontal and vertical swinging move-  
10 ments, and to the rearwardly projecting portions of which crank axles the rear wheels are journaled, independent devices for vertically adjusting said crank axles, means for holding said crank axles for parallel hori-  
15 zontal swinging movements, a beam connected to the central upper portion of said

scraper blade and projecting rearward thereof, a brace connected to a lower portion of said scraper blade and adjustably connected to the rear portion of said beam, a 20 draw bar pivotally connected to said beam, means for securing said draw bar in different horizontal angular adjustments in respect to said beam and scraper blade, and a pole connected to the forward end of said 25 draw bar, substantially as described.

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

HARRY K. CLEMONS.

Witnesses:

A. H. LYNCH,

EDWARD H. WILSON.