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2,086,430

ROAD GRADING MACHINE

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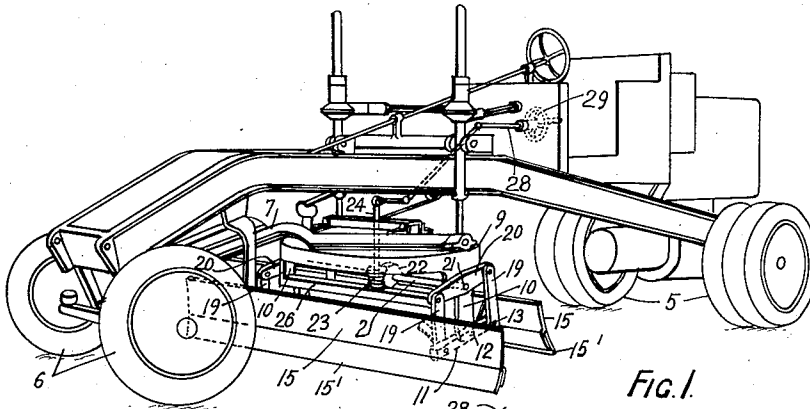


FIG. 1.

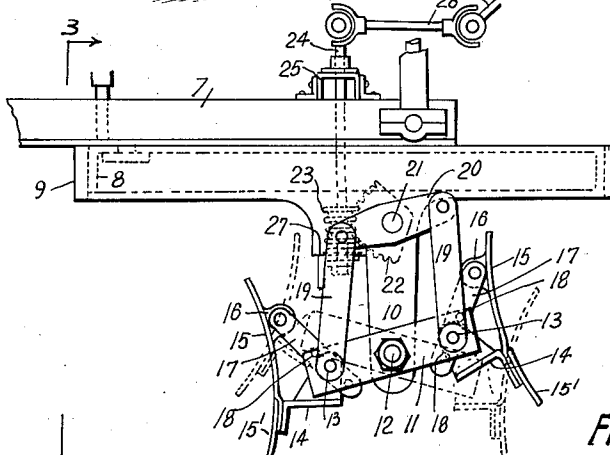


FIG. 2.

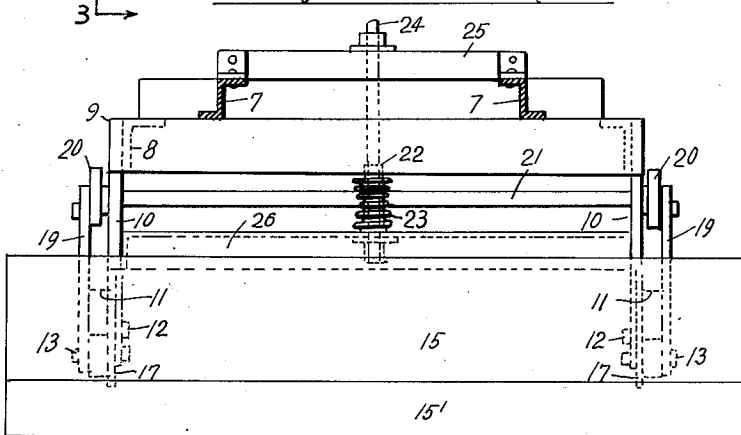


FIG. 3.

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ROAD-GRADING MACHINE

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7 Claims. (Cl. 37—156)

This invention relates to road-grading machines or implements which are self-propelled or are adapted for traction by mechanical or other means. A machine of this type is equipped with a transverse scraper blade which is vertically adjustable and angularly adjustable both horizontally and vertically as may be required for the work to be performed.

The object of the present invention is to provide an improvement in the mentioned type of grader to the end that it may be rendered operative when progressing in either direction (forward or reverse), thus eliminating the waste of time involved in turning the machine or in backwardly retracing its course with the blade in inoperative position.

With the above stated object the invention consists in a road-grading machine provided with two oppositely disposed scraper-blades, one adapted to operate when the machine is moving forwardly, and the other adapted to operate when the machine is moving backwardly, the blades being so arranged and mounted that each of them is adjustable from inoperative to operative position and vice versa.

The invention also consists in a road-grading machine having two oppositely disposed scraper-blades which are so mounted and arranged that either is adjustable from inoperative to operative position simultaneously with converse adjustment of the other.

The invention also consists in a construction including means for mounting the blades and of adjusting them as required.

A practical embodiment of the invention as applied to a power driven road-grading machine of known type will now be described with reference to the accompanying drawing, it being understood that the invention may be applied to other types of machines and that those parts of the depicted machine which are of usual or known type are not particularly described herein.

In the drawing,

Fig. 1 is a perspective view,

Fig. 2 is a part side elevation, and

Fig. 3 a sectional elevation on line 3, 3 of Fig. 2.

The machine comprises a main frame 4 supported on rear wheels 5, and steering wheels 6 at its front end, and a sub-frame 7 pivotally mounted at one end to the front of the machine and carrying at its rear end the blade circle 8 which is adjustable in known manner, and to which is secured the blade circle plate 9 formed with de-

pendent lugs 10, 10. All the foregoing is known construction and need not be further described.

According to the present invention each dependent lug 10 carries a rocking lever 11 pivoted at its centre as at 12 to the lower end of the lug, and pivotally secured by pins 13, 13 to the ends of this lever are brackets 14, 14 to which respectively are attached in any suitable way the oppositely disposed scraper blades 15, 15 each fitted with a removable cutting edge 15¹. Near the upper edge of each blade 15 is a lug 16 to which is pivoted one end of an adjustable strut member 17 provided with a series of holes 18 any one of which may engage the inner end of pivot pin 13, thus providing for angular adjustment of the blade about the pivot 13 and maintenance of the adjusted disposition. This construction permits adjustment of each blade to vary the angle of its cutting edge in relation to the ground surface.

Also attached to the pivot pins 13 are links 19, 19 the upper ends of which are pivotally attached to opposite ends respectively of a rocking lever 20 fixed on the end of a shaft 21 having bearing in the lugs 10, 10.

It will be understood that on the other side of the machine there is provided an exactly similar combination and arrangement of parts as indicated in Fig. 3.

Fixed on the shaft 21 is a worm sector 22 which is engaged by a worm 23 fixed on a vertical shaft 24 disposed concentrically with the blade circle 8 and having upper bearing in a cross member 25 attached to the sub-frame 7, and lower bearing in a cross member 26 secured to a shoulder 27 on each lug 10. The shaft 24 is restrained by any suitable means against longitudinal movement, and is coupled at its upper end to a flexibly jointed shaft 28 terminating in a hand-wheel 29 (Fig. 1) located conveniently to the driver of the machine.

By appropriate manipulation of hand-wheel 29 shaft 21 may be rotated in either direction per medium of shaft 24 and worm gear 23—22 and thus, per medium of lever 20 and links 19, oscillate lever 11 about its pivotal centre 12 to raise or lower either scraper blade. In the drawing the blade facing the front of the machine is shown in operative position, and the blade facing the rear of the machine is shown in raised or inoperative position. This disposition of the blades is used when the machine is progressing in the normal (forward) way, but when the machine is travelling backwardly the blade disposition is reversed as shown by dotted lines in Fig. 2. Obviously the blades may be adjusted to an intermediate position wherein neither is operative

and the machine may be freely moved in either direction.

When the machine is travelling backwardly and the rear blade is operating, the thrust is reversed, and to compensate for this the blade circle plate 9 is formed as a complete ring embracing the blade circle 8.

The shaft 24 being concentric with the blade circle, the lugs 10, 10 are so arranged that the shaft 21 and pivot pin 12 are distanced from said centre sufficiently to permit the assembly of the worm gear 23—22.

I claim:

1. A road-grading machine of the type which includes a sub-frame, a blade circle mounted thereon and a blade circle plate secured to the latter and formed with dependent lugs, including two parallel levers pivoted at their centres to the lower ends of said lugs respectively, a scraper blade secured to corresponding ends of said levers, a second scraper blade, oppositely disposed to the first mentioned blade, secured to the other ends of said levers, and means for oscillating said levers to bring either blade to operative position and lift the other to inoperative position.

2. A road-grading machine according to claim 1 hereof, in which each blade is pivotally mounted on its support and is adjustable about its pivot to vary the angle of its cutting edge in relation to the ground surface.

3. A road-grading machine according to claim 1 hereof, in which the means for adjusting the blades consists of two rocking levers parallel to and similar to the blade-carrying levers and fixed on the ends of a horizontal transverse rocking shaft, links connecting the ends of the rocking levers with corresponding ends of the blade-carrying levers, gearing for rotating said shaft in either direction, and means for actuating said gearing.

4. A road-grading machine according to claim 1 hereof, in which the means for adjusting the blade carrying levers comprise a horizontal transverse rocking shaft having on its ends levers connected at their ends respectively to corresponding ends of the blade-carrying levers, a drive shaft at right-angles to said transverse shaft, worm gearing between said shafts, and means for rotating said drive shaft in either direction to effect rotation of the rocking shaft and consequent raising of one blade and lowering of the other.

5. A road-grading machine including, in combination, a wheel-supported main frame, an adjustable sub-frame, a blade-circle plate carried on said sub-frame and provided with two dependent lugs, two blade-carrying levers respectively pivoted at their centres to the lower portions of said lugs, brackets pivoted on the ends of said levers, a scraper-blade attached to the brackets on corresponding ends of said levers, a second scraper-blade oppositely disposed to the other blade attached to the brackets on the other ends of said levers, adjustable strut members for adjusting the angularity of said blades, a transversely arranged rocking shaft located above and parallel to the pivots of the blade-carrying levers, and carrying on its ends levers similar to the blade-carrying levers and connected thereto by parallel links, a worm wheel sector secured on said rocking shaft, a vertical shaft passing through the centre of the blade circle plate, a worm fixed on said shaft and gearing with the worm wheel sector, a flexible shaft coupled to said vertical shaft, and a hand-wheel on said flexible shaft for rotating the latter in either direction to raise one scraper blade and lower the other as required.

6. A road-grading machine including, in combination, a main frame mounted on wheels, an adjustable sub-frame mounted on the main frame, blade-supporting means mounted for rotation in a horizontal plane on said sub-frame, two oppositely disposed scraper blades carried by said supporting means, one of said blades to operate when the machine is moving forwardly and the other when the machine is moving backwardly and means for adjusting the blades independently of the frame to bring either into operative position in relation to the ground surface and the other into inoperative position or to bring both into inoperative position.

7. A road-grading machine including, in combination, a main frame mounted on wheels, an adjustable sub-frame mounted on the main frame, a blade-circle on the sub-frame, a blade-circle-plate embracing the blade circle and provided with pendant lugs, a transversely disposed horizontal shaft rotatably mounted in said lugs, blade carrying means fixed on said shaft, two oppositely disposed scraper blades secured respectively on opposite sides of the carrying means, and means for oscillating said shaft about its axis to lift one blade and lower the other.

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