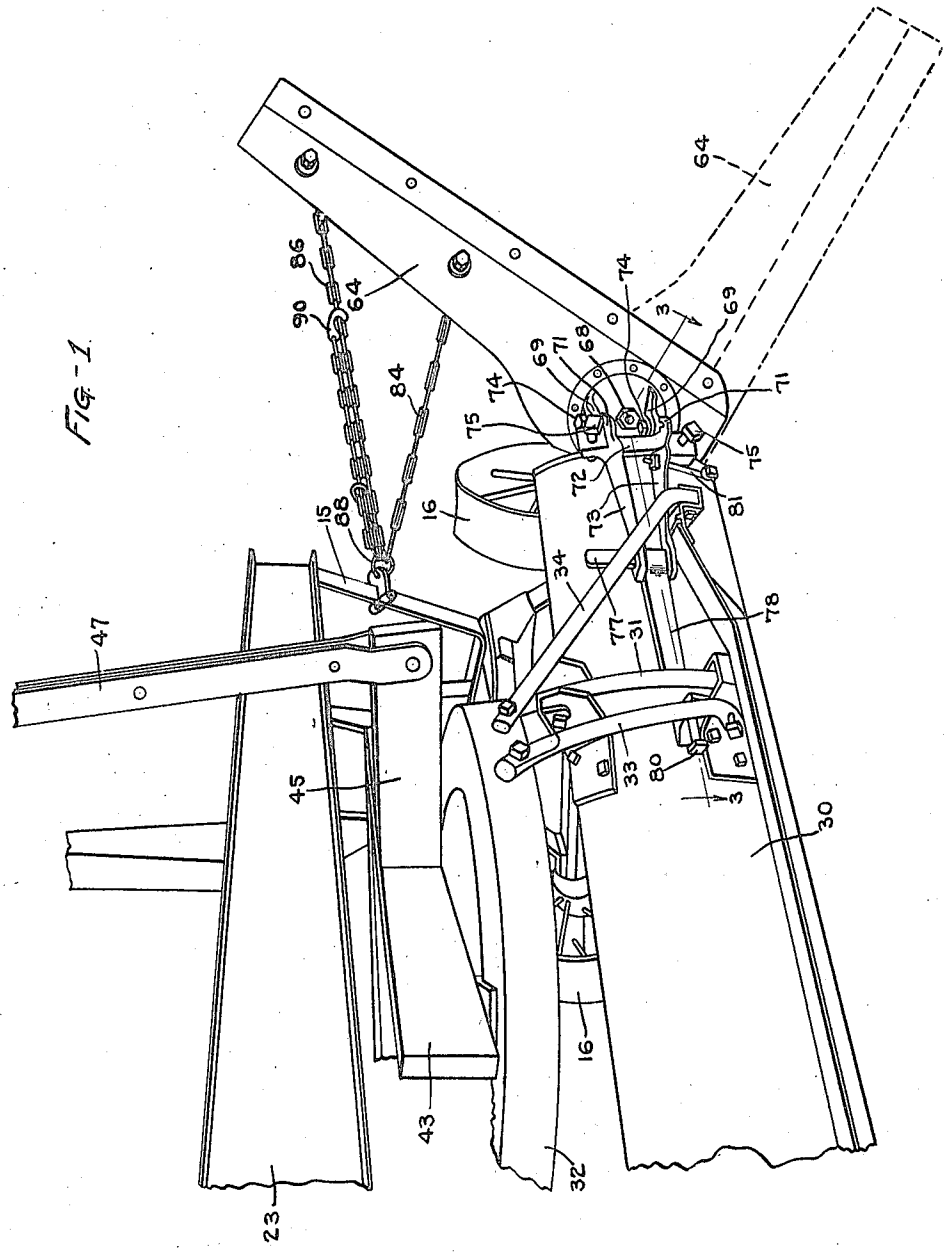
June 5, 1923. 1,457,862

C. K. STOCKLAND

ROAD GRADING MACHINE

Filed Oct. 17, 1921 3 Sheets-Sheet 1

FIG. 1.



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ROAD GRADING MACHINE

Filed Oct. 17, 1921 3 Sheets-Sheet 2

FIG.-2

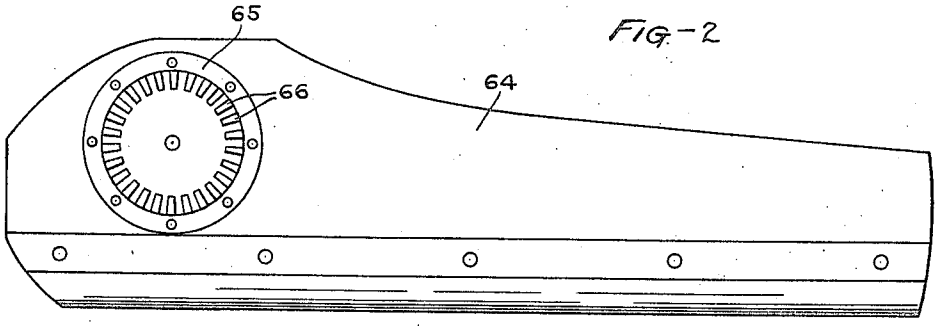
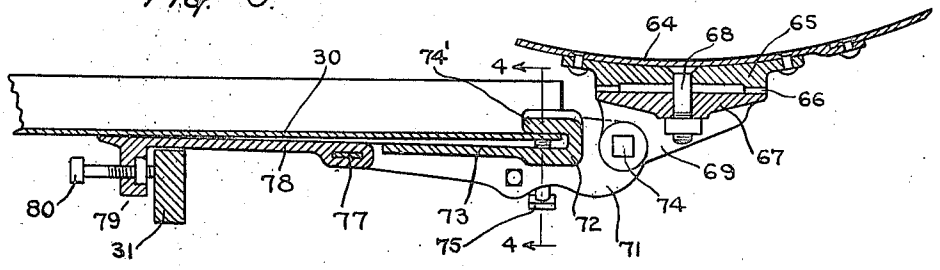


FIG.-3.



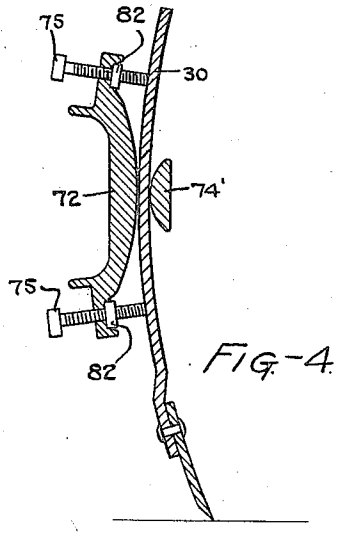


FIG.-4

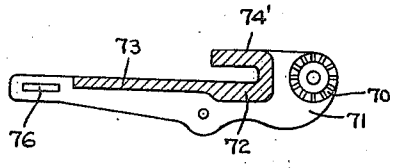


FIG.-5.

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ROAD GRADING MACHINE

Filed Oct. 17, 1921

3 Sheets-Sheet 3

FIG-6.

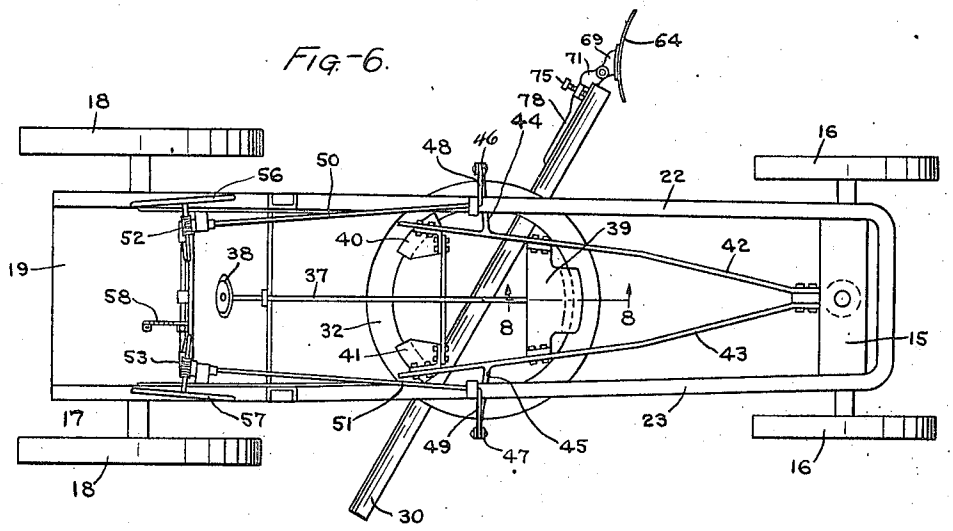


FIG-7

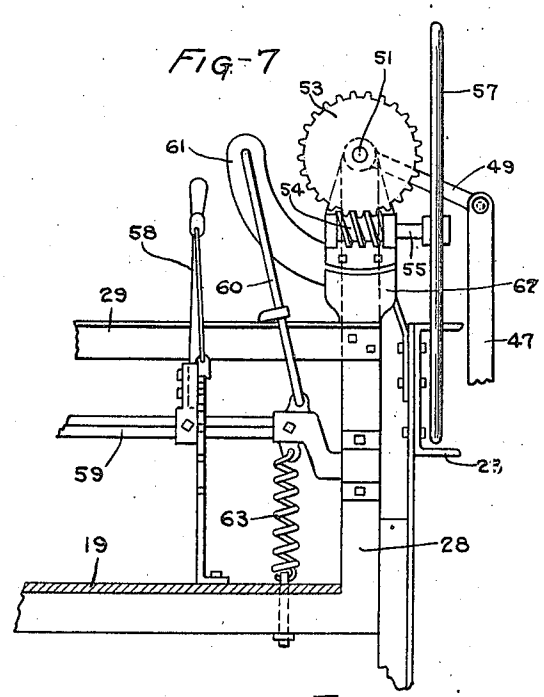
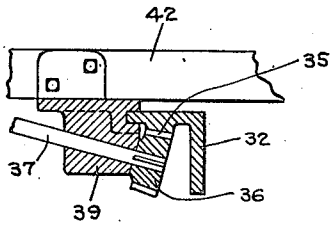


FIG-8



INVENTOR:
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Patented June 5, 1923. 1,457,862

UNITED STATES PATENT OFFICE.

CHARLES K. STOCKLAND, OF MINNEAPOLIS, MINNESOTA.

ROAD-GRADING MACHINE.

Application filed October 17, 1921. Serial No. 508,067.

To all whom it may concern:

Be it known that I, CHARLES K. STOCKLAND, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Road-Grading Machines, of which the following is a specification.

My invention relates to road grading machines. An object is to provide an auxiliary blade for attachment to the main scraper blade of such machines, so as to operate in connection therewith. Another object is to provide for so mounting the auxiliary blade that it may be adjusted both vertically and horizontally with relation to the main blade and may be readily attached to either end thereof. Another object is to provide an auxiliary blade in combination with the main blade of a standard road grading machine in which the main blade having the auxiliary blade secured thereto is carried by a wheel-supported frame, and is adapted to be raised and lowered and to be reversed in position to operate either right or left as desired.

The full objects and advantages of my invention will appear in connection with the detailed description, and the novel features embodied in my inventive idea will be particularly pointed out in the claims.

In the accompanying drawings which illustrate the application of my invention in one form,—

Fig. 1 is a fragmentary view in perspective showing my auxiliary blade attached to the main blade, raised position of the auxiliary blade being shown in full lines and horizontal position being shown in dotted lines. Fig. 2 is a rear elevational view of the auxiliary blade. Fig. 3 is a view in section on the line 3—3 of Fig. 1. Fig. 4 is a view in section on the line 4—4 of Fig. 3. Fig. 5 is a sectional elevational view of one of the supporting members of the auxiliary blade. Fig. 6 is a plan view of a road grading machine to which my invention is adapted to be applied. Fig. 7 is a fragmentary sectional elevational view taken transversely of the machine. Fig. 8 is a detail view in section on the line 8—8 of Fig. 6.

Referring to the construction shown in the drawings, a front truck member 15 is mounted upon wheels 16 and a rear truck member 17 is mounted on wheels 18, said rear member including a platform 19. The front and rear truck members are connected by longitudinal beams 22 and 23 which constitute part of the frame of the machine. At each side of the rear truck member, uprights 28 extend upwardly and are connected by cross bar 29. These uprights serve to support hand wheels and worm gearing for operating the scraper blade as will be described later. The scraper blade 30 is carried by supporting bars 31 toward each end of the blade and these supporting bars are connected to a ring member 32. The member 32 and the blade 30 are also connected by brace rods 33 and 34. The ring member 32 is constructed as best shown in section in Fig. 8 with horizontal and vertical flange portions, there being teeth 35 on the lower face of the horizontal flange to form an annular rack which is engaged by a pinion 36 secured to the forward end of a rod 37 rotatively mounted on the machine frame and having a hand wheel 38 secured to the rear end thereof. The ring member 32 is supported by means of the horizontal flange thereof engaging grooves in the castings 39, 40 and 41 which are secured to bars 42 and 43 which converge toward the front of the machine and are attached to the front truck. It is evident that by turning the hand wheel 38 the inclination of the scraper blade is varied and may be reversed either right or left. Arms 44 and 45 extend out from the bars 42 and 43 and these arms are connected by means of links 46 and 47 with crank arms 48 and 49 on the forward ends of rods 50 and 51 which are rotatively supported by means of uprights on the frame such as the uprights 28. Secured to the rods 50 and 51 are worm gears 52 and 53 which are engaged by worms such as the worm 54 shown in Fig. 7 mounted on short shafts 55 to which hand wheels 56 and 57 are secured. If both hand wheels are operated simultaneously, the scraper blade will be lifted or lowered bodily. Upon operating one or the other of the hand wheels, the scraper blade may be raised or lowered at one end only. On account of the worm gearing, these operations are necessarily quite slow. When it is desired to quickly lift the scraper blade, as for instance, when it is desired to avoid a rock or stump, this may be done by operating a lever 58. As shown in Fig. 7, this lever is secured to a shaft 59 having arms which are connected by links 60 with arc-shaped members 61 slidable in arc-shaped

brackets 62 secured below the upper ends of the uprights 28. The members 61 are provided with ears in which are mounted the short shafts 55 previously referred to. When the lever 58 is pulled downwardly, the arc-shaped members 61 are slid and the scraper blade will be swung upwardly with a quick movement on account of the rocking movement of the rods 50 and 51 in the manner disclosed in my prior Patent No. 1,123,420. Springs 63 are expanded when the scraper blade is lowered into this operative position, and the tendency of these springs to contract aids in balancing the weight of the scraper blade so that it is easier to lift. The auxiliary blade which I employ is designated in general by the reference numeral 64. Secured to one end of this blade is a disk 65 carrying a circular series of teeth 66 adapted to engage with similar teeth carried by a plate 67. A bolt 68 carried by the disk 65 extends through the plate 67 so that the auxiliary blade 64 may be swung upwardly or downwardly around the bolt when the nut thereon is loosened. The plate 67 carries a pair of ears 69 which have circularly arranged teeth adapted to engage with circularly arranged teeth 70 carried by ears 71 formed on a clamping member 72 from which extend a pair of arms 73. Bolts 74 passing through holes in the ears 69 and 71 serve to hold the auxiliary blade for angular adjustment in a horizontal direction. The clamping member is placed so that the arms 73 lie on the back of the main blade 30 and a lug 74′ on the clamping member is positioned so as to lie on the front of this blade. A pair of screw bolts 75 extend through the clamping member and engage the plate 30 so as to secure the clamping member thereto. The ends of the arms 73 are provided with slots 76 adapted to receive a flat key 77 which also passes through a slot in one end of a bar 78, the other end of which has a lug 79 through which a screw bolt 80 extends into engagement with the supporting bar 31. By the means described, the auxiliary blade may be firmly attached to either end of the main blade and may be adjusted thereon both vertically and horizontally. In case it is desired to secure the auxiliary blade additionally against upward slipping on the main blade, a rod 81 may be secured to the lower edge of the scraper blade and to the lower arm 73. By reference to Fig. 4 it will be seen that the body portion of the clamping member 72 and the lug 74′ carried thereby are bowed away from each other so that they have a limited engagement only with the main blade 30. This permits the clamping member to have a rocking movement on the blade 30 when either of the bolts 75 is loosened. These bolts thread through nuts 82 which are adapted to fit into recesses near the upper and lower edges of the clamping member. By adjusting the upper and lower bolts in and out it is obvious that the clamping member and the auxiliary blade carried thereby will be rocked about a horizontal axis so that the slant of the auxiliary blade may be varied. If desired, chains may be provided to relieve the strain on the auxiliary blade when the machine is in operation. As shown in Fig. 1, chains 84 and 86 are attached to the auxiliary blade and these chains pass through a ring 88 attached to the frame of the machine at its forward end. A hook 90 on the free end of the chain 86 serves for securing the chains in taut condition according to the extent to which the auxiliary blade is adjusted.

The operation and advantages of my invention will be obvious from the foregoing description. The clamping support for the auxiliary blade may be readily attached to either end of the main blade, and, in practice, will ordinarily be secured to the end which occupies a forward position as shown in Fig. 1. By the means previously described, it is apparent that the main blade may be oscillated when desired to bring its other end into forward position. On account of the adjustable mounting of the auxiliary blade, it may be secured either in the position shown in dotted lines or in full lines in Fig. 1 and may also be secured in intermediate position. When the auxiliary blade is in the dotted line position, it will operate to level off a ridge or elevation lying beyond the end of the main blade, the first being moved in the opposite direction from that in which it is moved by the main blade. When the auxiliary blade is in the full line position, it will operate upon a bank or slope which is close to the edge of the road. When the auxiliary blade is secured to the main blade and the machine is in operation, it is apparent that when any of the previously described movements are given to the main blade, such movements will also be given to the auxiliary blade, and it is further apparent that the latter may be quickly lifted if desired by lifting the main blade.

I claim:

1. In combination with the main blade of a road grading machine, an auxiliary blade, a clamping member, means for securing said auxiliary blade to said clamping member, a lug on said clamping member adapted to engage the front surface of the main blade at one end thereof, and adjustable means carried by the upper and lower portions of said clamping member for engagement with the rear surface of the main blade whereby adjustment of said adjustable means causes the inclination of said auxiliary blade to be varied.

2. In combination with the main blade of a road grading machine, an auxiliary blade,

a clamping member, means for securing said auxiliary blade to said clamping member, a lug on said clamping member adapted to engage the front surface of the main blade at one end thereof, the surfaces of said lug and the body portion of the clamping member which face each other being bowed away from each other to permit rocking movement of said clamping member on the main blade, and screw bolts carried by the upper and lower portions of said clamping member for engagement with the rear surface of the main blade whereby adjustment of said screw bolts causes the inclination of said auxiliary blade to be varied.

3. In combination with the main blade of a road grading machine, an auxiliary blade, teeth near one end of said blade, a plate, teeth on said plate with which said first mentioned teeth are adapted to engage, means for adjustably holding said teeth in engagement with each other, a clamping member, means for securing said plate to said clamping member, and means for adjustably securing said clamping member to one end of the main blade.

4. In combination with the main blade of a road grading machine, an auxiliary blade, a plate, means for securing said auxiliary blade to said plate, horizontal ears carried by said plate, a plurality of teeth on said ears, a clamping member, horizontal ears carried by said clamping member, teeth on said last mentioned ears with which said plurality of teeth are adapted to engage, means for adjustably holding said sets of teeth in engagement with each other, and means for securing said clamping member to an end of the main blade.

5. In combination with the main blade of a road grading machine, an auxiliary blade, teeth near one end of said blade, a plate, teeth on said plate with which said first mentioned teeth are adapted to engage, means for adjustably holding said teeth in engagement with each other, horizontal ears carried by said plate, a plurality of teeth on said ears, a clamping member, horizontal ears carried by said clamping member, teeth on said last mentioned ears with which said plurality of teeth are adapted to engage, means for adjustably holding said last mentioned sets of teeth in engagement with each other, and means for securing said clamping member to an end of said main blade.

In testimony whereof I hereunto affix my signature.

CHARLES K. STOCKLAND.