

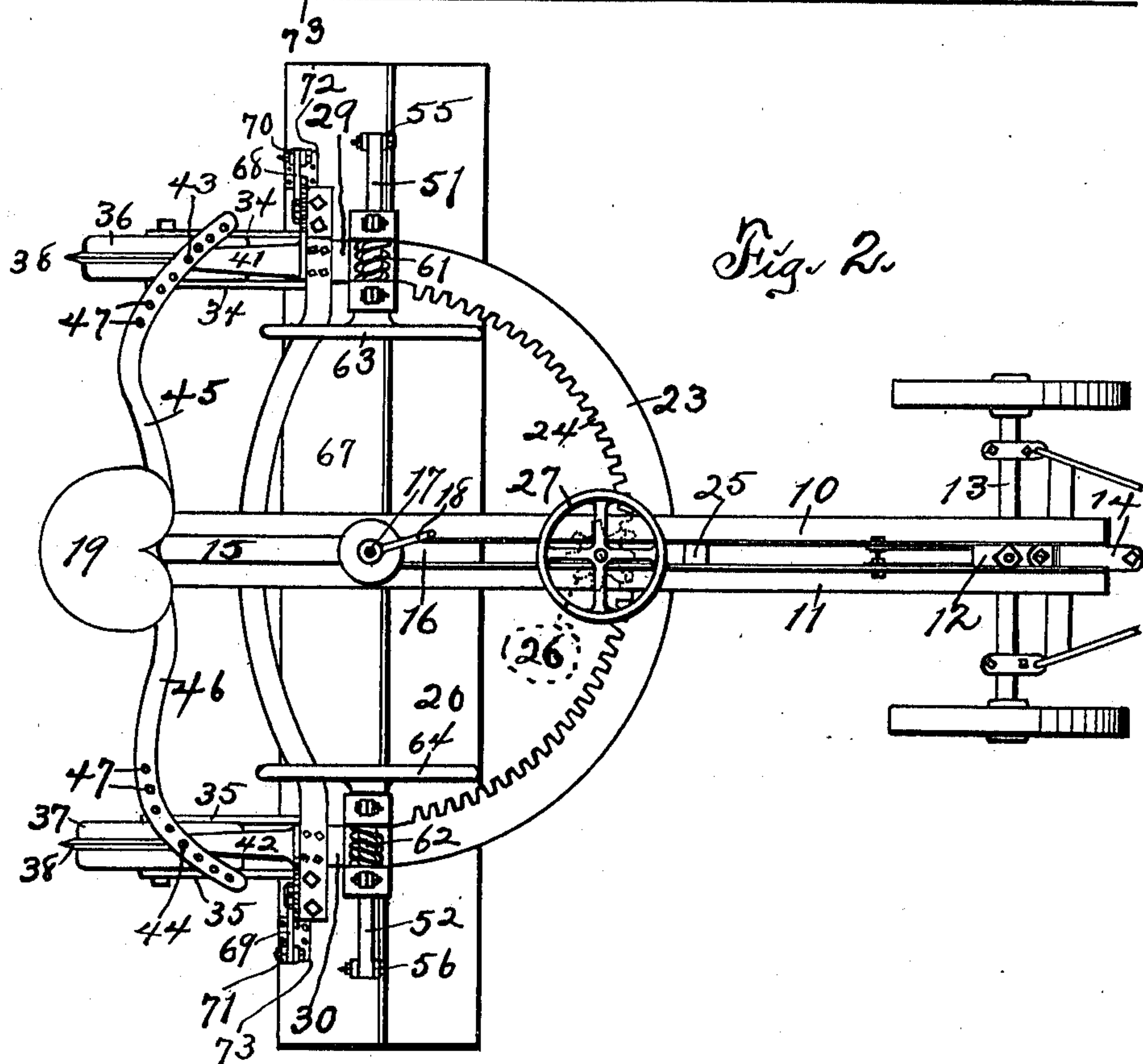
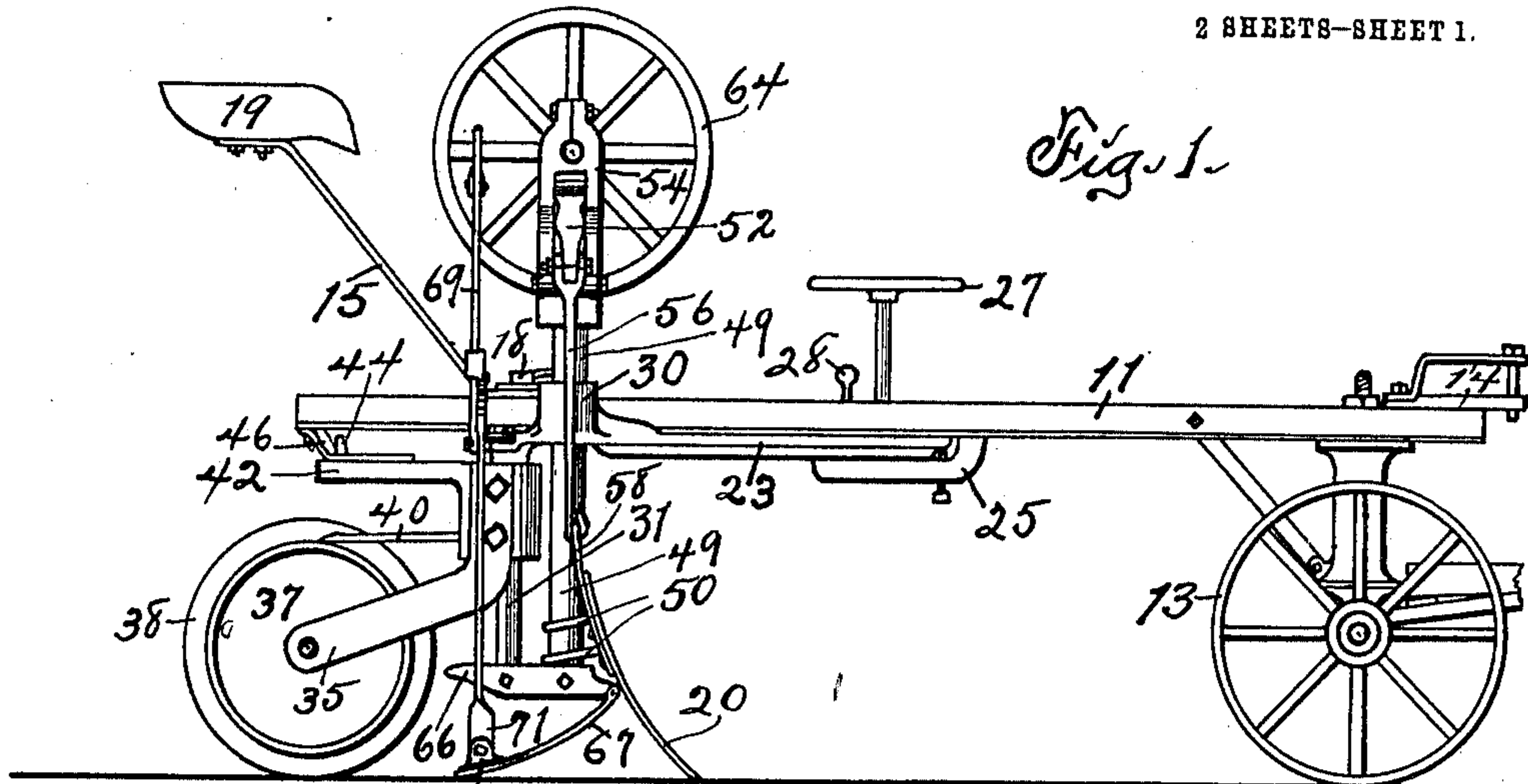
N. K. SKOW.
ROAD GRADER.

APPLICATION FILED OCT. 14, 1909.

978,498.

Patented Dec. 13, 1910.

2 SHEETS—SHEET 1.



Attest:
Ed. W. Miller
H. G. Sweet.

Inventor:
Nils K. Skow
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N. K. SKOW.

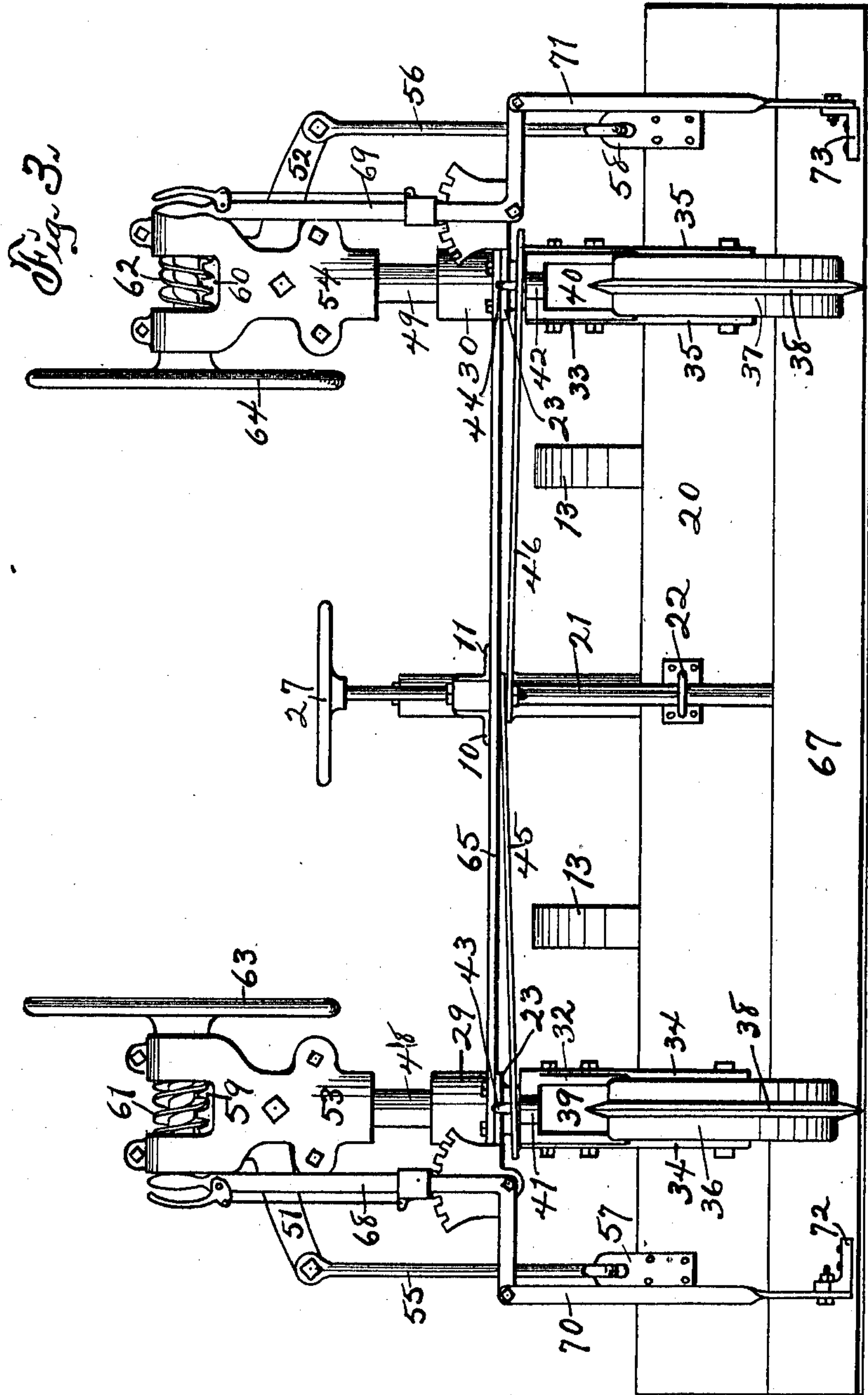
ROAD GRADER.

APPLICATION FILED OCT. 14, 1909.

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2 SHEETS—SHEET 2.



Attest:
Chas. W. Miller
H. G. Sweet.

Inventor:
Niels K. Skow
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UNITED STATES PATENT OFFICE.

NIELS K. SKOW, OF NEWTON, IOWA.

ROAD-GRADER.

978,498.

Specification of Letters Patent.

Patented Dec. 13, 1910.

Application filed October 14, 1909. Serial No. 523,082.

To all whom it may concern:

Be it known that I, NIELS K. SKOW, a citizen of the United States of America, and resident of Newton, Jasper county, Iowa, have invented a new and useful Road-Grader, of which the following is a specification.

The object of this invention is to provide an improved construction for road graders. A further object of this invention is to provide means for leveling and smoothing, pulverizing, dragging and pressing the surface of the ground at the rear of a scraper blade in a road grader.

A further object of this invention is to provide means for raising and lowering and locking a metal shoe relative to and at the rear of the scraper blade of a road grader.

A further object of this invention is to provide means for adjusting and locking casters relative to the frame of a road grader.

A further object of this invention is to provide means for adjusting and locking a seat relative to the frame of a road grader.

My invention consists in the construction, arrangement and combination of elements hereinafter set forth, pointed out in my claims and illustrated by the accompanying drawing, in which—

Figure 1 is a side elevation of the complete machine. Fig. 2 is a plan of the same. Fig. 3 is an enlarged rear elevation of the machine, the seat being removed.

In the construction of the machine as shown a beam is provided and is formed of angle bars 10, 11 arranged parallel with each other, slightly spaced apart and having their flanges projecting outwardly at the bottoms of their ribs. A block 12 is mounted between and bolted to the forward portions of the bars 10, 11. A steering truck 13 is journaled in the block 12 and supports the forward end portions of the bars 10, 11. A draft clevis 14 is mounted on the block 12 and a whiffle-tree not shown may be secured to said clevis for the purpose of drawing the machine over the surface of the ground. A seat-bar 15 is pivoted on and extends rearward and upward from the angle bars 10, 11 adjacent to the rear ends thereof. A block 16 is mounted between and fixed to the bars 10, 11 adjacent the rear ends thereof and a bolt 17 extends vertically through said block and through the lower end portion of the seat bar 15. A handle-nut 18 is secured on the upper end of the block 16 and serves

to connect the seat bar to the block. A seat 19 is carried on the upper rear end portion of the bar 15.

A scraper blade 20 is provided and it may be made of any desired material in any desired shape. For convenience I show the scraper blade 20 of conventional form, concavo-convex in cross-section and sharpened at its lower margin. An arm 21 extends downward from the block 16 and the lower end portion of said arm is embraced loosely by a yoke 22 fixed to and extending rearward from the central portion of the scraper blade 20. A segment-bar 23 is mounted beneath and extends across the central portions of the angle bars 10, 11 and is formed with a gear 24 on its concaved margin. A block 25 is mounted between and fixed to the angle bars 10, 11 and extends beneath the segment-bar 23, and a gear 26 is journaled on said block and meshes with the gear 24. A hand-wheel 27 is carried by and above the gear 26 in a plane above the beam. A pin 28 may be placed between teeth of the gear 26 and enter a hole in the block 25 and serve to lock said gear in any position in which it may be placed manually. Brackets 29, 30 are fixed to end portions of the segment-bar 23 and extend above and below said bar.

Swivel-stems 31 (one of which is shown in Fig. 1) are formed on and extend downward from rear portions of the brackets 29, 30 and caster heads 32, 33 are swiveled on said stems. Arms 34, 35 are fixed in pairs to and extend downwardly and rearwardly from the caster heads 32, 33 and casters 36, 37 are journaled between extremities of said arms. Each of the casters 36, 37 is formed with a central peripheral flange, rib or fin. Clearers or scrapers 39, 40 are fixed to and extend rearward from the caster heads 32, 33, are notched to straddle the central flanges 38 and engage the casters at their uppermost points. The caster heads 32, 33 are formed with arms 41, 42 extending rearwardly from their upper ends and studs or pins 43, 44 are formed on or fixed to and rise from extremities of said arms.

Spring-arms 45, 46 are pivoted at their inner ends, on vertical axes, to the rear end portion of the beam and extend in opposite directions therefrom across the arms 41, 42. The spring-arms 45, 46 are formed with a plurality of holes 47 between their centers and outer ends whereby they are adapted to engage adjustably with the studs or pins 43,

44 on the arms 41, 42. The spring-arms 45, 46 are curved between their ends. It is the function of the spring-arms 45, 46 to hold the caster heads 32, 33 in given positions in which they may be placed manually so that the casters will travel on desired lines relative to the path of travel of the beam and front truck, and the connection between said arms and the pins 43, 44 may be adjusted to permit of desired adjustment of the caster heads and casters. In this connection it may be stated that it is the function of the flanges or ribs 38 to prevent skidding of the machine and cause the casters to travel in desired directions under control of manual adjustments of the caster heads.

Vertical bearings are formed in the brackets 29, 30 in front of the caster stems 31 and above end portions of the segment-bar 23 and stems 48, 49 are mounted in said bearings. The lower portions of the stems 48, 49 extend loosely through loops or yokes 50 (two of which are shown in Fig. 1), mounted on and extending rearward from end portions of the scraper blade 20. It is the function of the loops 50 to connect the end portions of the scraper blade 20 slidingly to the stems 48, 49. Bell-crank levers 51, 52 are mounted in slots of and fulcrumed to bearings 53, 54 mounted on the upper ends of the stems 48, 49. The long arms of the bell-cranks 51, 52 are approximately horizontal and extend in opposite directions from the bearings 53, 54 and are connected pivotally at their outer ends to hanger-rods 55, 56. The hanger-rods 55, 56 loosely and pivotally engage at their lower ends with hanger-plates 57, 58 fixed to end portions of the scraper blade 20. The hanger-plates 57, 58 are fixed to rear faces of the scraper blade 20 adjacent to the ends thereof and extend above the upper margin of said blade. The short arms of the levers 51, 52 extend upward within the bearings 53, 54 and are formed with worm gears 59, 60 on their upper ends. Worms 61, 62 are journaled in the upper ends of the bearings 53, 54 and engage the worm gears 59, 60. Hand-wheels 63, 64 are fixed to inner end portions of the worms 61, 62. The wheels 63, 64 are adapted for manual rotation independently of each other for the purpose of revolving the worms 61, 62 in either direction. The bell-cranks 51, 52 acting through the hanger-rods 55, 56 and hanger-plates 57, 58 raise or lower either end of the scraper blade 20 independently of the other. The scraper blade 20 oscillates on a vertical axis determined by the rod or stem 21 and also oscillates on a variable horizontal axis as it may be raised or lowered at either end by the hand-wheel 63 or 64 or raised at one end and lowered at the other end by said hand-wheels.

A bar 65 is fixed to and connects end portions of the segment-bar 23 and projects

laterally at opposite ends therefrom. The central portion of the bar 65 is curved rearwardly. Brackets 66, one of which is shown in Fig. 1, are fixed to and extend forwardly and rearwardly from lower end portions of the stems 48, 49. The lower end portions of the caster stems 31 are fixed to the rear portions of the brackets 66. A shoe 67 is hinged at points on its forward margin adjacent its ends to the forward ends of the brackets 66. Bell-crank levers 68, 69 are fulcrumed on the laterally projecting end portions of the cross-bar 65 and are provided with suitable detent devices for holding said levers in relation to said cross-bar in any positions in which they may be placed manually. At times the bell-crank levers 68, 69 may stand as shown in Fig. 3 of the drawing with their upper arms in approximately vertical positions and adapted for manual operation, and their lower arms extending in opposite directions outwardly from the machine frame. The outer ends of the lower arms of the bell-crank levers 68, 69 are pivotally connected to hanger-rods 70, 71 and the lower ends of said hanger-rods are pivotally connected to angle plates 72, 73, which angle plates are fixed to the shoe 67. The angle plates 72, 73 are located on the upper surfaces of the shoe 67 adjacent to the rear margin thereof and are spaced inward from ends of said shoe. When the shoe 67 is located in the position shown in the accompanying drawing it drags after and serves to press, smooth and pulverize clods on the surface of the ground over which the scraper blade 20 is moved. The shoe may be adjusted by manipulation of the bell-crank levers 68, 69 into such position that its lower margin is in a plane below the cutting edge of the blade 20 at which time said shoe serves to pulverize, drag, compress and smooth the surface of the soil independent of the scraper blade. For instance, the scraper blade may be employed only to engage and cut off hummocks or considerable projections from the surface of the soil, all of the dragging, smoothing, pulverizing and pressing being done by the shoe 67. This adjustment can be carried to the extent that the scraper blade 20 is in wholly inoperative position, all of the work being done by the shoe; or, in the other extreme, the shoe may be adjusted into inoperative position and all of the work be done by the scraper blade.

I claim as my invention—

1. A road grader, comprising a beam, a caster truck supporting the forward end of said beam, means for attaching draft power to said beam, a scraper blade arranged transversely and pivoted to said beam, a segment slidingly connected to said beam, sliding connections between end portions of the segment and end portions of the scraper

blade, casters swiveled to said segment, means for connecting said casters, and levers fulcrumed on said segment and flexibly connected to end portions of said blade.

5 2. A road grader comprising a beam, a
caster truck supporting the forward end of
said beam, means for attaching draft power
to said beam, a scraper blade arranged trans-
versely and pivoted and arranged for ver-
tical sliding movement relative to said beam,
10 a segment slidingly connected to said beam,
sliding connections between end portions of
the segment and end portions of the scraper
blade, casters swiveled to said segment,
15 means for connecting said casters, and levers
fulcrumed on said segment and flexibly con-
nected to end portions of said blade.

3. A road grader comprising a beam, a
caster truck supporting the forward end of
20 said beam, means for attaching draft power
to said beam, a scraper blade arranged
transversely and pivoted to said beam, a
segment slidingly connected to said beam,
sliding connections between end portions of
25 the segment and end portions of the scraper
blade, casters swiveled to said segment,
means for connecting said casters adjust-
ably to each other and to the beam, and
levers fulcrumed on said segment and flexi-
30 bly connected to end portions of said blade.

4. A road grader comprising a beam, a
caster truck supporting the forward end of
said beam, means for attaching draft power
to said beam, a scraper blade arranged
35 transversely and pivoted to said beam, a
segment slidingly connected to said beam,
sliding connections between end portions of
the segment and end portions of the scraper
blade, casters swiveled to said segment,
40 means for connecting said casters, and
worm-operated bell-crank levers fulcrumed
on said segment and flexibly connected to
end portions of said blade.

5. A road grader comprising a beam, a
45 caster truck supporting the forward end of
said beam, means for attaching draft power
to said beam, a scraper blade arranged
transversely and pivoted and arranged for
vertical sliding movement relative to said
50 beam, a segment slidingly connected to said
beam, sliding connections between end por-
tions of the segment and end portions of the
scraper blade, casters swiveled to said seg-
ment, means for connecting said casters ad-
55 justably to each other and to the beam, and
worm-operated bell-crank levers fulcrumed
on said segment and flexibly connected to
end portions of said blade.

6. A road grader, comprising a beam, a
60 caster truck supporting the forward end of
said beam, means for attaching draft power
to said beam, a scraper blade arranged
transversely and pivoted and arranged for
vertical sliding movement relative to said
65 beam, a segment slidingly connected to said

beam and arched forwardly from said
scraper blade, brackets fixed to end portions
of said segment, casters journaled in said
brackets, stems in said brackets, yokes
loosely connecting end portions of the 70
scraper blade to said stems, manually-oper-
ated lever mechanism carried by said stems
for independently raising and lowering end
portions of the scraper blade, and adjust-
able connections between said casters and 75
the beam.

7. A road grader, comprising a beam, a
caster truck supporting the forward end of
said beam, means for attaching draft power
to said beam, a scraper blade arranged 80
transversely and pivoted and arranged for
vertical sliding movement relative to said
beam, a segment slidingly connected to said
beam and arched forwardly from said
scraper blade, manually operated gear mech- 85
anism for moving said segment relative to
the beam, brackets fixed to end portions of
said segment, casters journaled in said
brackets, stems in said brackets, yokes
loosely connecting end portions of the 90
scraper blade to said stems, manually-oper-
ated lever mechanism carried by said stems
for independently raising and lowering end
portions of the scraper blade, and adjust-
able connections between said casters and 95
the beam.

8. A road grader comprising a beam, a
caster truck supporting the forward end of
said beam, means for attaching draft power
to said beam, a scraper blade arranged trans- 100
versely and pivoted and arranged for ver-
tical sliding movement relative to said beam,
a segment slidingly connected to said beam
and arched forwardly from said scraper
blade, brackets fixed to end portions of said 105
segment, casters journaled in said brackets
and arranged for vertical sliding movement
of the brackets relative thereto, stems in said
brackets, yokes loosely connecting end por-
tions of the scraper blade to said stems, 110
manually-operated lever mechanism carried
by said stems for independently raising and
lowering end portions of the scraper blade,
and adjustable connections between said
casters and the beam. 115

9. A road grader comprising a beam, a
caster truck supporting the forward end of
said beam, means for attaching draft power
to said beam, a scraper blade arranged trans- 120
versely and pivoted and arranged for verti-
cal sliding movement relative to said beam, a
segment slidingly connected to said beam and
arched forwardly from said scraper blade,
brackets fixed to end portions of said seg-
ment, casters journaled in said brackets and 125
arranged for vertical sliding movement of
the brackets relative thereto, said casters
formed with central peripheral flanges,
stems in said brackets, yokes loosely con-
necting end portions of the scraper blade to 130

said stems, manually-operated lever mechanism carried by said stems for independently raising and lowering end portions of the scraper blade, and adjustable connections
5 between said casters and the beam.

10. In a road grader, the combination of a beam, a segment thereon, casters journaled to the segment, a blade carried by said beam and segment, means for raising and lower-
10 ing said blade relative to said beam and segment and relative to said casters, and adjustable connections between said casters and beam whereby the casters are locked against oscillation relative to each other or to the
15 blade.

11. In a road grader, a beam, a segment thereon, a scraper blade carried by said segment and beam, brackets on the segment, casters journaled in said brackets, spring-
20 bars pivoted to said beam and formed with a series of holes in their outer ends, and pins on frames of said casters adapted to engage one or another of the holes in each spring bar.

25 12. A road grader comprising a beam, a caster truck supporting the forward end of said beam, means for attaching draft power to said beam, a scraper blade arranged transversely and pivoted to said beam, a segment
30 slidingly connected to said beam, sliding connections between end portions of the segment and end portions of the scraper blade, casters swiveled to said segment, means for connecting said casters, levers fulcrumed on
35 said segment and flexibly connected to end portions of said blade, a shoe suspended from and hinged relative to said segment at the rear of said blade, and means for raising and lowering said shoe.

40 13. A road grader comprising a beam, a caster truck supporting the forward end of said beam, means for attaching draft power to said beam, a scraper blade arranged transversely and pivoted and arranged for verti-
45 cal sliding movement relative to said beam, a segment slidingly connected to said beam, sliding connections between end portions of the segment and end portions of the scraper blade, casters swiveled to said segment, means
50 for connecting said casters, levers fulcrumed on said segment and flexibly connected to end portions of said blade, a shoe suspended from and hinged relative to said segment at the rear of said blade, and means for raising
55 and lowering said shoe.

14. A road grader comprising a beam, a caster truck supporting the forward end of said beam, means for attaching draft power to said beam, a scraper blade arranged trans-
60 versely and pivoted to said beam, a segment slidingly connected to said beam, sliding connections between end portions of the segment and end portions of the scraper blade, casters swiveled to said segment, means for
65 connecting said casters adjustably to each

other and to the beam, levers fulcrumed on said segment and flexibly connected to end portions of said blade, a shoe suspended from and hinged relative to said segment at the rear of said blade, and means for raising
70 and lowering said shoe.

15. A road grader comprising a beam, a caster truck supporting the forward end of said beam, means for attaching draft power to said beam, a scraper blade arranged trans-
75 versely and pivoted to said beam, a segment slidingly connected to said beam, sliding connections between end portions of the segment and end portions of the scraper blade, casters swiveled to said segment, means for
80 connecting said casters, worm-operated bell-crank levers fulcrumed on said segment and flexibly connected to end portions of said blade, a shoe suspended from and hinged relative to said segment at the rear of said
85 blade, and means for raising and lowering said shoe.

16. A road grader comprising a beam, a caster truck supporting the forward end of said beam, means for attaching draft power
90 to said beam, a scraper blade arranged transversely and pivoted and arranged for vertical sliding movement relative to said beam, a segment slidingly connected to said beam, sliding connections between end portions of
95 the segment and end portions of the scraper blade, casters swiveled to said segment, means for connecting said casters adjustably to each other and to the beam, worm-operated bell-crank levers fulcrumed on said seg-
100 ment and flexibly connected to end portions of said blade, a shoe suspended from and hinged relative to said segment at the rear of said blade, and means for raising and lowering said shoe.
105

17. A road grader, comprising a beam, a caster truck supporting the forward end of said beam, means for attaching draft power to said beam, a scraper blade arranged trans-
110 versely and pivoted and arranged for vertical sliding movement relative to said beam, a segment slidingly connected to said beam and arched forwardly from said scraper blade, brackets fixed to end portions of said segment, casters journaled in said brackets,
115 stems in said brackets, yokes loosely connecting end portions of the scraper blade to said stems, manually-operated lever mechanism carried by said stems for independently raising and lowering end portions of the
120 scraper blade, adjustable connections between said casters and the beam, a shoe suspended from and hinged relative to said segment at the rear of said blade, and means for raising and lowering said shoe.
125

18. A road grader comprising a beam, a caster truck supporting the forward end of said beam, means for attaching draft power to said beam, a scraper blade arranged trans-
130 versely and pivoted and arranged for verti-

cal sliding movement relative to said beam, a segment slidingly connected to said beam and arched forwardly from said scraper blade, manually-operated gear mechanism for moving said segment relative to the beam, brackets fixed to end portions of said segment, casters journaled in said brackets, stems in said brackets, yokes loosely connecting end portions of the scraper blade to said stems, manually-operated lever mechanism carried by said stems for independently raising and lowering end portions of the scraper blade, adjustable connections between said casters and the beam, a shoe suspended from and hinged relative to said segment at the rear of said blade, and means for raising and lowering said shoe.

19. A road grader comprising a beam, a caster truck supporting the forward end of said beam, means for attaching draft power to said beam, a scraper blade arranged transversely and pivoted and arranged for vertical sliding movement relative to said beam, a segment slidingly connected to said beam and arched forwardly from said scraper blade, brackets fixed to end portions of said segment, casters journaled in said brackets and arranged for vertical sliding movement of the brackets relative thereto, stems in said brackets, yokes loosely connecting end portions of the scraper blade to said stems, manually-operated lever mechanism carried by said stems for independently raising and lowering end portions of the scraper blade, adjustable connections between said casters and the beam, a shoe suspended from and hinged relative to said segment at the rear of said blade, and means for raising and lowering said shoe.

20. A road grader comprising a beam, a caster truck supporting the forward end of

said beam, means for attaching draft power to said beam, a scraper blade arranged transversely and pivoted and arranged for vertical sliding movement relative thereto, a segment slidingly connected to said beam and arched forwardly from said scraper blade, brackets fixed to end portions of said segment, casters journaled in said brackets and arranged for vertical sliding movement of the brackets relative thereto, said casters formed with central peripheral flanges, stems in said brackets, yokes loosely connecting end portions of the scraper blade to said stems, manually-operated lever mechanism carried by said stems for independently raising and lowering end portions of the scraper blade, adjustable connections between said casters and the beam, a shoe suspended from and hinged relative to said segment at the rear of said blade, and means for raising and lowering said shoe.

21. In a road grader, the combination of a beam, a segment thereon, casters journaled to the segment, a blade carried by said segment and beam, means for raising and lowering said blade relative to said beam and segment and relative to said casters, adjustable connections between said casters and beam whereby the casters are locked against oscillation relative to each other or to the blade, a shoe suspended from and hinged relative to said segment at the rear of said blade, and means for raising and lowering said shoe.

Signed by me at Des Moines, Iowa, this twenty second day of September, 1909.

NIELS K. SKOW.

Witnesses:

W. W. FINK,
S. C. SWEET.