No. 890,796. PATENTED JUNE 16, 1908.

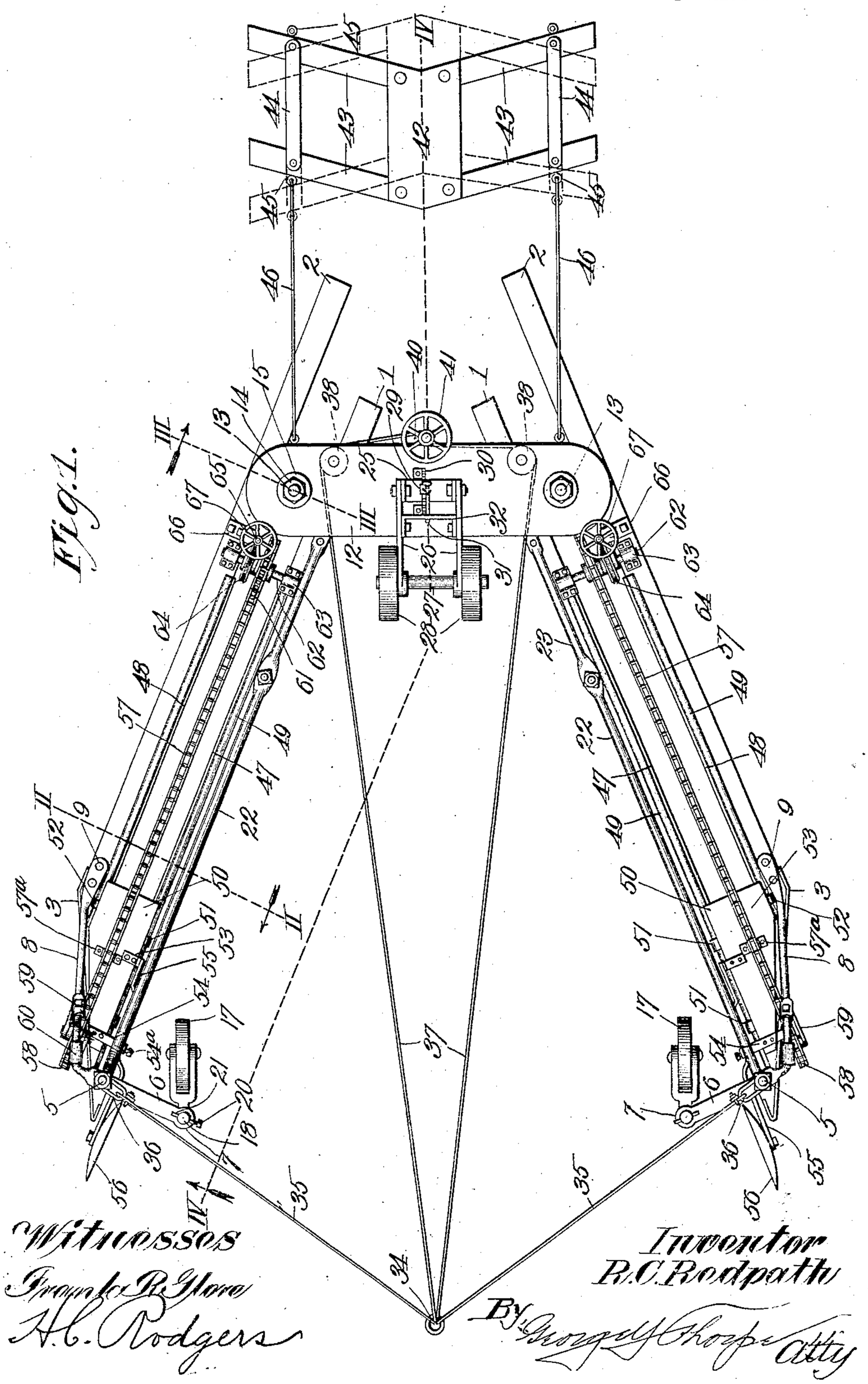
R. C. REDPATH.

ROAD GRADING MACHINE.

APPLICATION FILED OCT. 23, 1907.

2 SHEETS—SHEET 1.

Fig. 1.



No. 890,796. PATENTED JUNE 16, 1908.

R. C. REDPATH.

ROAD GRADING MACHINE.

APPLICATION FILED OCT. 23, 1907.

2 SHEETS—SHEET 2.

Fig. 2.

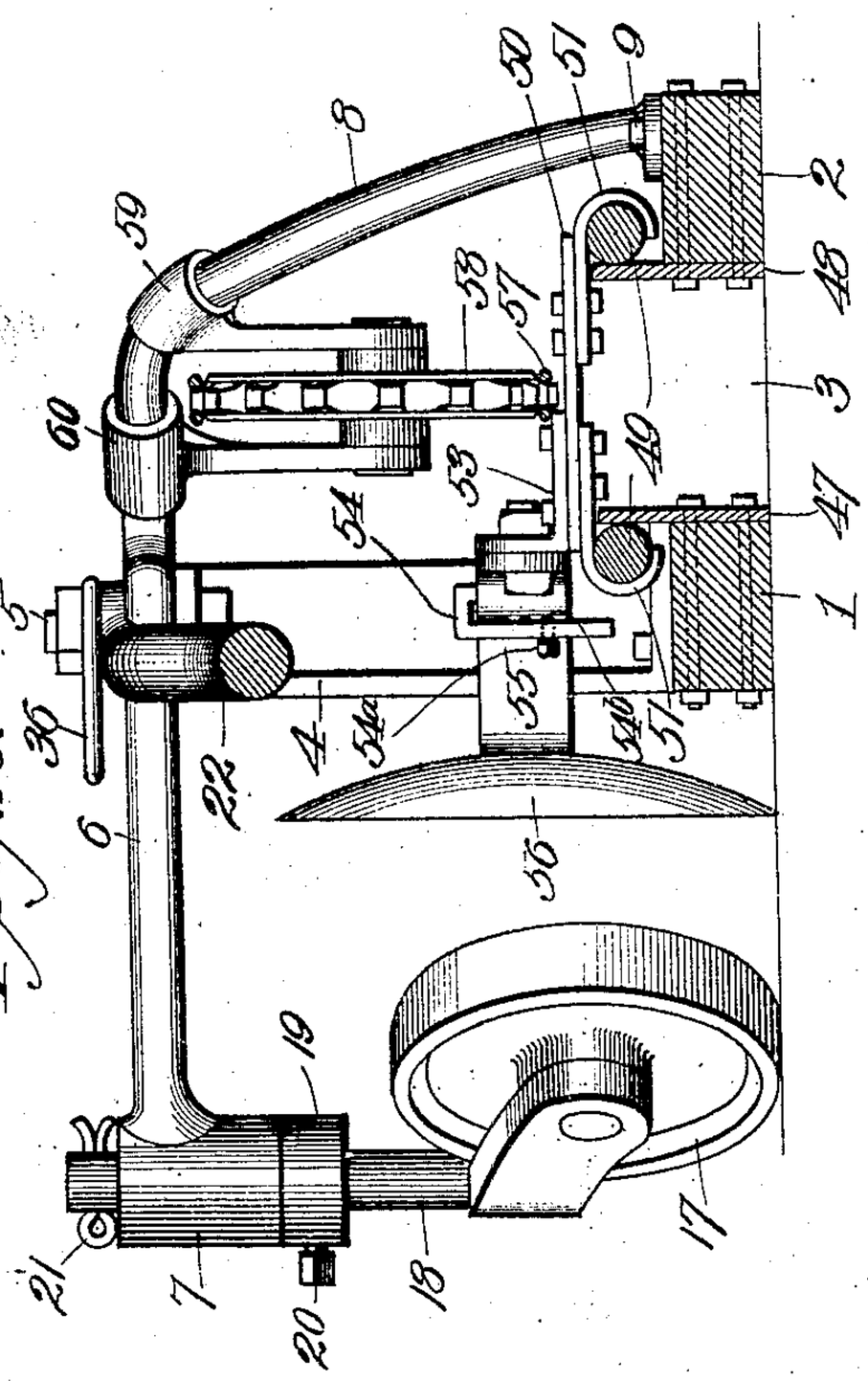


Fig. 3.

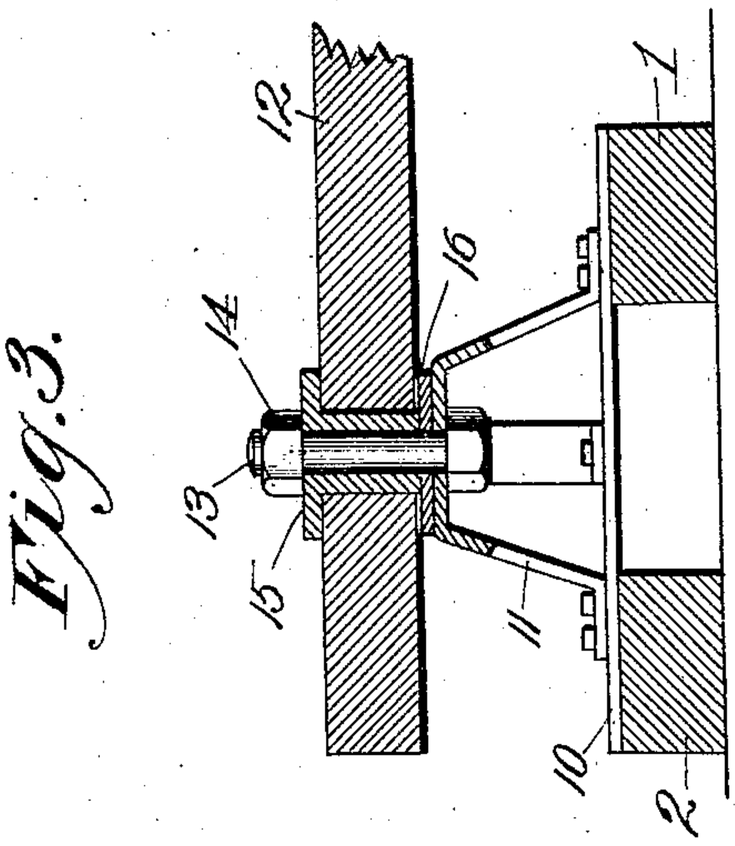
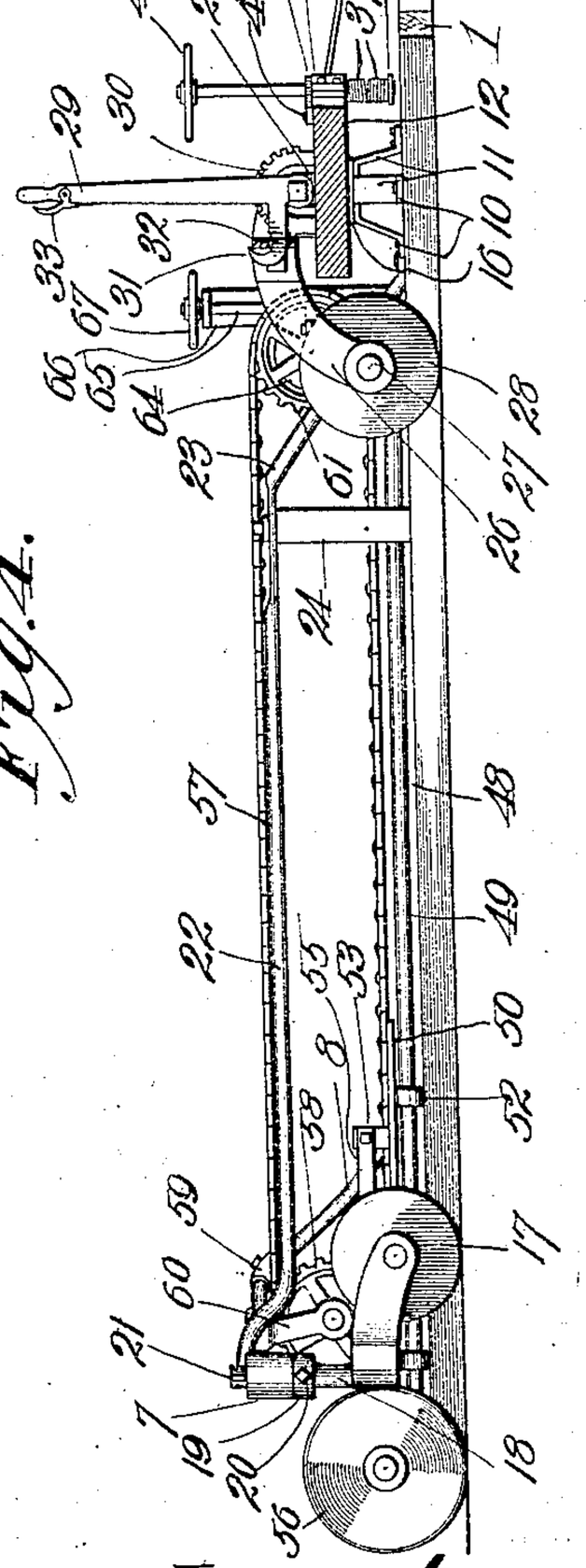


Fig. 4.



Witnesses
Frank R. Glover
H. C. Rodgers

Inventor
R. C. Redpath
By Geo. Y. Thorpe Atty.

UNITED STATES PATENT OFFICE.

ROBERT C. REDPATH, OF OLATHE, KANSAS.

ROAD-GRADING MACHINE.

No. 890,796. Specification of Letters Patent. Patented June 16, 1908.

Application filed October 23, 1907. Serial No. 398,855.

To all whom it may concern:

Be it known that I, ROBERT C. REDPATH, a citizen of the United States, residing at Olathe, in the county of Johnson and State of Kansas, have invented certain new and useful Improvements in Road-Grading Machines, of which the following is a specification.

This invention relates to road grading machines and my object is to produce a machine of this character by which a road may be easily, quickly and symmetrically leveled or graded.

A further object is to produce a road grading machine which can be expanded or contracted laterally to accommodate roads of varying width and to permit of passage over bridges or culverts.

A further object is to produce a machine of this character by which banks at one or both sides of the roadway may be cut away in the event that it is desired to widen the road to the full grading capacity of the machine.

A still further object is to produce vertically adjustable wheels to be used when necessary to transport the machine inoperatively from place to place.

With these and other objects in view as hereinafter appear the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1, is a top plan view of a road grading machine embodying my invention. Fig. 2, is an enlarged section taken on the line II—II of Fig. 1. Fig. 3, is an enlarged section taken on line III—III of Fig. 1. Fig. 4, is a vertical section on line IV—IV of Fig. 1.

In the said drawings, a pair of drag frames are each constructed as follows:—1 and 2 indicate parallel bars of substantially the same length by preference but arranged with the former projecting forwardly beyond and terminating at its rear end short of the corresponding end of the latter. 3 is a bar connecting the front ends of bars 1 and 2 and converging forwardly with the former and forming conjointly therewith a pointed front end for the drag frame. 4 is a standard erected upon the drag frame contiguous to its point and bolted upon said standard as at 5 is a bar 6 extending transversely of the drag frame and terminating inward thereof in a vertical hub or sleeve 7. It also extends outwardly from the standard for a short distance and thence downwardly and rearwardly as at 8 to the front end of the outer bar of the drag frame, where it is rigidly secured by bolts 9 as shown. Near their rear ends bars 1 and 2 are connected by a cross plate 10 carrying an arched bracket 11 supporting and pivoted to one end of a cross plank 12, the pivot 13 being a bolt which extends up through the arched bracket and the plank and is engaged by a retaining nut 14. To reduce wear to the minimum a flanged sleeve 15 is fitted in the seat plank on bolt 13 and a washer 16 is interposed between the bracket 11 and the lower end of the sleeve 15.

17 is a caster having its stem 18 projecting vertically upward and journaled in sleeve 7 and provided with an adjustable collar 19 to engage the lower end of and form a support for sleeve 7, a set screw 20 securing the collar at the desired point of adjustment on the stem. A spring cotter 21 or its equivalent engages the stem above the sleeve to prevent any possibility of dislocation of the caster.

To stiffen the drag frame and form a brace for the standard 4 a longitudinal bar 22 is secured at its front end to said standard by the same bolt by preference, which secures bar 6 to the standard see Fig. 2. At a suitable point bar 22 is bent downward as at 23 and secured at its rear end to bar 1, this inclined portion forming a brace for a vertical bar 24, erected upon bar 1 just forward of said inclined portion 23. The pair of drag frames pivoted to the cross plank 12 diverge forwardly therefrom at varying angles, the angle of divergence being varied when desired to accommodate roads of different widths or the particular work to be done.

25 indicates a U-shaped bracket secured centrally to the cross plank 12, and 26 a frame pivoted at its rear end to said bracket and equipped at its front end with a shaft 27 equipped with ground wheels 28, which wheels in conjunction with the casters 17 are adapted to be utilized in supporting the drags off the ground when transporting the machine from one place to another inoperatively.

29 is a lever pivoted to a sector 30 in line with the pivotal point of frame 26 and provided with a forwardly projecting hook 31 engaging the cross bar 32 of frame 26, so

that by operating the lever the wheels 28 can be raised or lowered, a catch mechanism 33 being carried by the lever for engagement with the sector to lock the wheels at the desired point of adjustment.

34 indicates a ring or clevis to which an engine or horses may be attached to pull the machine, and 35 are cables or equivalent connections between said ring and loops 36 secured to the front end of the drag frames coincidently with bars 6 and 22.

37 indicates a pair of cables secured at their front ends to ring 34 and diverging rearwardly therefrom and engaging sheaves 38 secured to plank 12 at its under side. From the shafts the cables extend to opposite sides of a vertical drum 39, journaled in bearing brackets 40 secured to the rear edge of the plank. The shaft of the drum is provided at its upper end with a lever or hand wheel 41 and it will also be provided with a ratchet wheel 41ª for engagement by a dog 41ᵇ pivoted to the plank to hold the drum against back rotation and to be kicked or otherwise tripped from engagement with the ratchet wheel when desired, by the person in control who will be stationed upon the plank.

To operate upon that portion of the roadway centrally between the two frames and which therefore they do not touch, I provide a trailing drag frame, the same consisting of a central plate 42 provided with laterally projecting wings 43, there being preferably a plurality of wings at each side of the plate connected together by bars 44. This drag frame may be arranged so as to force dirt outwardly as shown in full lines, Fig. 1, or its position may be reversed for the purpose of forcing the dirt inwardly from opposite sides, as indicated by its position in dotted lines. The wings of the frame are provided with eye-bolts 45 connected as at 46 by rods or cables to the drag frame cross plank. Secured to the adjacent edges of the drag frame bars 1 and 2 are longitudinal bars 47 and 48, which carry track rails 49 for adjustable carriages, each consisting of a bed 50 corresponding approximately in form to the front end of the pivoted drag frames and provided with hooks 51 and 52 respectively engaging the inner and outer track rails 49.

53 are angle brackets secured to the carriages and 54 vertically slotted brackets attached to the carriages forward of angle brackets 53.

55 are bars pivoted at their rear ends to brackets 53 and extending through the slotted brackets 54 so as to be capable of vertical adjustment therein. The bars are bent so as to dispose their ends forward of the slotted brackets inward of the bars 1 and are equipped at such ends with cutting disks 56 which project forwardly beyond the front ends of the drag frames so that when the machine is expanded to its full width the forward ends of the disks shall be disposed apart a distance equal to the width of the machine at its widest point and thus be adapted for cutting away the bank at the sides of the road to increase the width of the roadway to the full capacity of the machine, the slotted brackets being equipped with set screws 54ª for engagement with the openings 54ᵇ, in bars 55 for the purpose of securing the disks with their cutting edges below the plane of the drag frames if it be desired to provide shallow gutters or channels in the roadway for drainage or other purposes.

To longitudinally adjust the carriages for the purpose of causing the disks to operate at varying distances apart, endless chains 57 are arranged longitudinally of the drag frames and the carriages and are secured rigidly to brackets 57ª carried by the latter, the chains at their front ends engaging sprocket wheels 58 journaled in brackets 59 and 60 secured to the bars 6 and at their rear ends engage sprocket wheels 61 mounted on transverse shafts 62 journaled in bearing boxes 63 secured to the drag frame contiguous to the cross plank. 64 are worm wheels secured on said shafts and engaging vertical worm shafts 65 journaled in standards 66 secured to the outer bars 2 of the drag frames, and provided at their upper ends with hand wheels 67 the operation of which in one direction or the other results in sliding the carriages forward or rearward so as to dispose the cutting disks at varying distances apart.

Assuming that it is desired to move the machine to the road to be graded, the person in control first vertically adjusts the casters so as to impose the weight of the front ends of the drag frames thereon. He then throws lever 29 forward, this action resulting in utilizing the wheels 28 as a fulcrum so as to raise the rear ends of the pivoted drag frames slightly off the ground, the catch mechanism automatically securing the frames in this position. He then trips the pawl 41ª and starts the traction engine or horses coupled to ring 34, the result of such action unwinding cables 37 from the drum and swinging the pivoted drag frames inward until they are substantially parallel, the casters swinging around under bars 6, so as to travel substantially in circles struck from the pivotal points 13 of their respective drag frames. As soon as the frames have attained the position described, the person in control will preferably force the pawl into engagement with ratchet 41ª so as to prevent any undue slackening of cables 37.

As arranged the machine can be drawn over a narrow roadway or over any ordinary bridge or culvert. When the road to be graded is reached the operator trips the catch mechanism so as to take the weight of the

machine off wheels 28 and permit its rear end to rest on the ground. He then loosens collars 19 so as to permit the front end of the machine to also descend and rest upon the ground. The engine or horses are then started forward and the frictional resistance of the drag frames on the ground causes them to swing outwardly at their front ends as they move forward. When they have swung apart at their front ends the required distance, the operator grasps handle 41 and turns the drum so as to take up a portion of cables 37, the length taken up or rewound upon the drums depending on the distance which the front ends of the pivoted drag frames can move apart, that is to say as the length of the cables from ring 34 to sheaves 38 determines the angle of cables 35 to the longitudinal center of the road, they likewise determine the distance apart of the outer ends of said cables 35. As the machine travels over the ground the bars 1 and 2 act in the usual manner of inclined drags, that is to say they cause the loose earth to move inward so as to fill depressions over which the drags pass, the surplus earth being pushed to the center of the road and again distributed laterally in opposite directions by the trailing drag frame unless it is desired that the center of the road shall be left its highest point, in which event the trailing drag frame may be omitted. In the event that the center of the roadway is low it may be advisable to reverse the position of the trailing drag frame (see dotted lines) so that it shall also tend to draw the surface earth inward so as to fill said low portion of the roadway.

In case the road is high at one or more points parallel to the center of the roadway and is packed hard at such points, the operator can in a manner hereinbefore explained shift the carriages so as to dispose the cutting disks 56 in longitudinal alinement with said ridges so that as the machine is drawn along the disk shall cut away the ridge, the earth being leveled behind the disks by the drag frames. If it be desired to cut below the level of the drag frames, the disks can be depressed and so secured by the means hereinbefore described. In the event that the earth has fallen from a bank or banks on the roadway so as to undesirably narrow the same, and assuming that such roadway in width equals the machine when expanded to its full extent, the operator can shift the cutting disks to their extreme forward positions so that they shall cut away such banked earth and thus permit the front ends of the pivoted drag frames to operate against the face of the bank and level or grade the road in one operation for its entire width. If it be desired to produce a gutter at one or both sides of the roadway, the machine can be sustained chiefly by wheels 17 and 28 and one or both of the cutting disks as the case may be, depressed below the surface of the roadway so that as the machine is drawn along one or more gutters shall be cut therein.

From the above description it will be apparent that I have produced a machine embodying the features of advantage enumerated as desirable and I wish it to be understood that I do not desire to be restricted to the exact details of construction shown and described as obvious modifications will suggest themselves to one skilled in the art.

Having thus described the invention what I claim as new and desire to secure by Letters Patent, is:—

1. A road grading machine, comprising a pair of drag frames, a cross plank bridging the space between and pivotally connected to said frames, connections connected together at their front or inner ends and at their outer ends to the drag frames forward of the cross plank, and a pair of rearwardly diverging cables connected at their front ends to the inner ends of the connection and to the cross plank at their rear ends.

2. A road grading machine, comprising a pair of drag frames, a cross plank bridging the space between and pivotally connected to said frames, connections connected together at their front or inner ends and at their outer ends to the drag frames forward of the cross plank, a pair of rearwardly diverging cables connected at their front ends to the inner ends of the connections and to the cross plank at their rear ends, and means to pay out or take up said cables simultaneously.

3. A road grading machine, comprising a pair of drag frames, a cross plank bridging the space between and pivotally connected to said frames, connections connected together at their front or inner ends and at their outer ends to the drag frames forward of the cross plank, a pair of rearwardly diverging cables connected at their front ends to the inner ends of the connections and to the cross plank at their rear ends, and a drag frame rearward of and coupled to the cross plank and adapted to operate upon that portion of the roadway between the pivoted drag frames.

4. A road grading machine, comprising a pair of drag frames, a cross plank bridging the space between and pivotally connected to said frames, connections connected together at their front or inner ends and at their outer ends to the drag frames forward of the cross plank, a pair of rearwardly diverging cables connected at their front ends to the inner ends of the connections and to the cross plank at their rear ends, and a cutting disk movable with each drag frame.

5. A road grading machine, comprising a pair of drag frames, a cross plank bridging the space between and pivotally connected

to said frames, connections connected together at their front or inner ends and at their outer ends to the drag frames forward of the cross plank, a pair of rearwardly diverging cables connected at their front ends to the inner ends of the connections and to the cross plank at their rear ends, and cutting disks movable with the drag frames and longitudinally adjustable thereof.

6. A road grading machine comprising a pair of drag frames, a cross plank bridging the space between and pivotally connected to said frames, connections connected together at their front or inner ends and at their outer ends to the drag frames forward of the cross plank, a pair of rearwardly diverging cables connected at their front ends to the inner ends of the connections and to the cross plank at their rear ends, and vertically adjustable cutting disks movable with the drag frames.

7. A road grading machine comprising a pair of drag frames, a cross plank bridging the space between and pivotally connected to said frames, connections connected together at their front or inner ends and at their outer ends to the drag frames forward of the cross plank, a pair of rearwardly diverging cables connected at their front ends to the inner ends of the connections and to the cross plank at their rear ends, and cutting disks movable with the drag frames and vertically and longitudinally adjustable with respect thereto.

8. A road grading machine comprising a pair of drag frames, a cross plank bridging the space between and pivotally connected to said frames, connections connected together at their front or inner ends and at their outer ends to the drag frames forward of the cross plank, a pair of rearwardly diverging cables connected at their front ends to the inner ends of the connections and to the cross plank at their rear ends, and carriages longitudinally adjustable on the drag frames and equipped with cutting disk inward of the drag frames.

9. A road grading machine, comprising a pair of drag frames, a cross plank bridging the space between and pivotally connected to said frames, connections connected together at their front or inner ends and at their outer ends to the drag frames forward of the cross plank, a pair of rearwardly diverging cables connected at their front ends to the inner ends of the connections and to the cross plank at their rear ends, and carriages longitudinally adjustable on the drag frames and equipped with vertically adjustable cutting disks inward of the drag frames.

10. A road grading machine comprising a pair of drag frames, a cross plank bridging the space between and pivotally connected to said frames, connections connected together at their front or inner ends and at their outer ends to the drag frames forward of the cross plank, a pair of rearwardly diverging cables connected at their front ends to the inner ends of the connections and to the cross plank at their rear ends, carriages longitudinally adjustable on the drag frames, bars pivoted at their ends to the carriages, and cutting disks carried by said bars and disposed at the inner sides of their respective drag frames.

11. A road grading machine comprising a pair of drag frames, a cross plank bridging the space between and pivotally connected to said frames, connections connected together at their front or inner ends and at their outer ends to the drag frames forward of the cross plank, a pair of rearwardly diverging cables connected at their front ends to the inner ends of the connections and to the cross plank at their rear ends, carriages mounted on the drag frames and equipped with cutting disks inward thereof, endless chains secured to the carriages, sprocket wheels carried by the drag frames and engaged by the front ends of the chains, sprocket wheels suitably journaled and engaged by the rear ends of said chains, and means for turning the last-named sprocket wheels to operate the chains and longitudinally adjust the carriages.

12. A road grading machine comprising a pair of drag frames, a cross plank bridging the space between and pivotally connected to said frames, connections connected together at their front or inner ends and at their outer ends to the drag frames forward of the cross plank, a pair of rearwardly diverging cables connected at their front ends to the inner ends of the connections and to the cross plank at their rear ends, carriages mounted on the drag frames and equipped with cutting disks inward thereof, an endless chain secured to the carriages, sprocket wheels carried by the drag frames and engaged by the front ends of the chains, sprocket wheels suitably journaled and engaged by the rear ends of the chains, and a worm gearing for turning the last named sprocket wheels to operate the chain and longitudinally adjust the carriages.

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

ROBERT C. REDPATH.

Witnesses:
H. C. RODGERS,
G. Y. THORPE.