

Oct. 9, 1934.

S. H. BURNSTAD

1,975,767

ROAD GRADER AND DITCHER

Filed Dec. 7, 1931

2 Sheets-Sheet 1

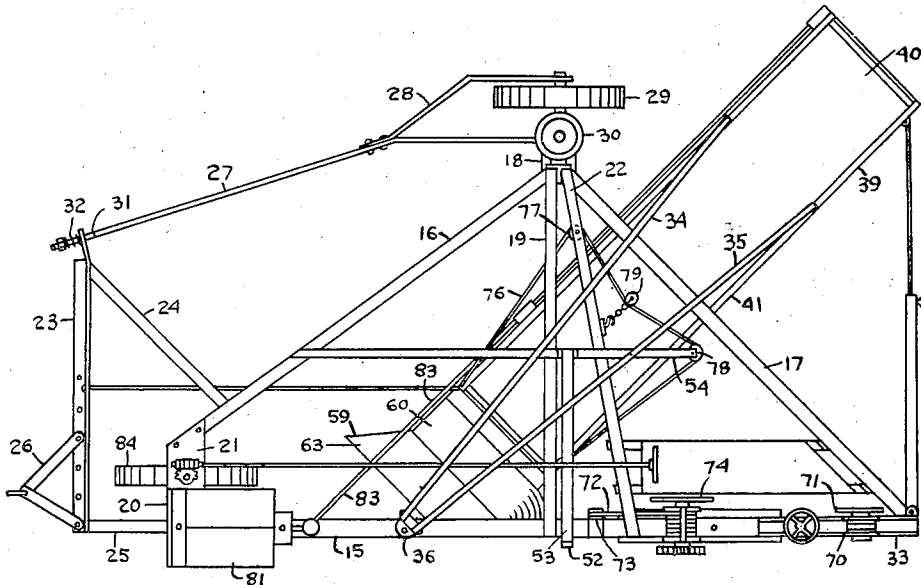


Fig. 1.

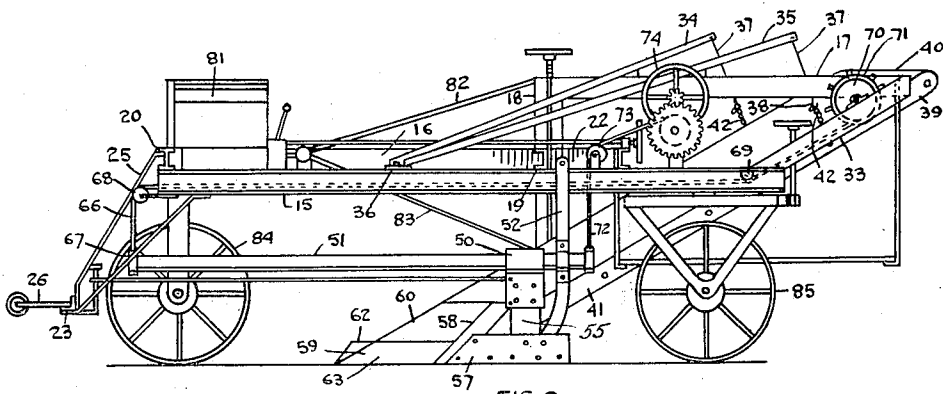


FIG. 2

INVENTOR
S. H. Burnstad
by: C. J. Fetherstonhaugh
ATTORNEY

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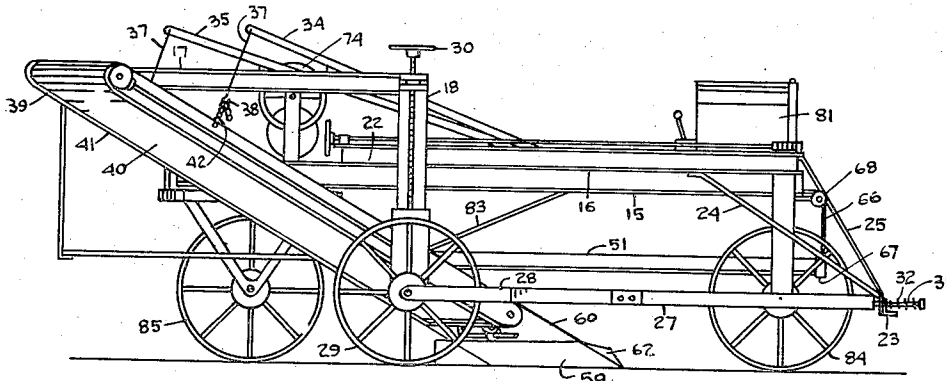


FIG. 3

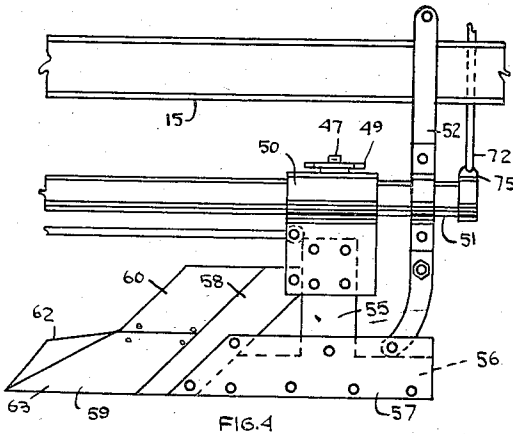


FIG. 4

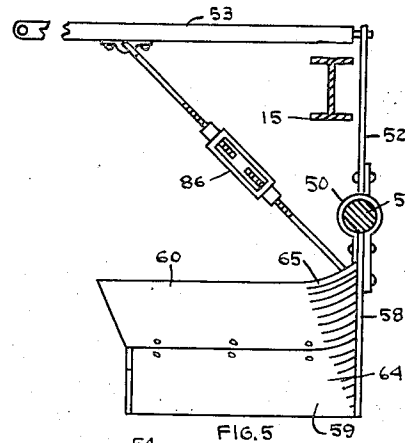


FIG. 5

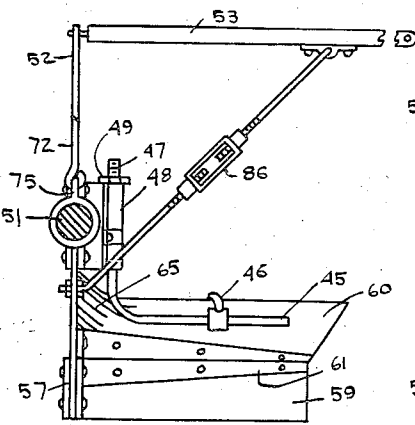


FIG. 6

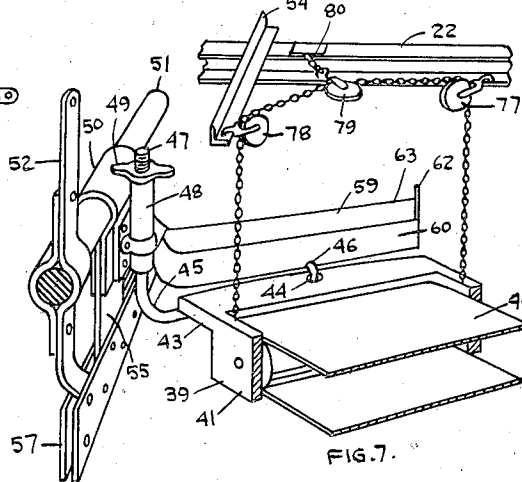


FIG. 7

INVENTOR
S. H. Burnstad
by G. J. Fetherstonhaugh
ATTORNEY

UNITED STATES PATENT OFFICE

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ROAD GRADER AND DITCHER

Sigurd Hans Burnstad, Ohaton, Alberta, Canada,
 assignor to Burnstad Grading Machine Com-
 pany, Limited, Edmonton, Alberta, Canada, a
 corporation

Application December 7, 1931, Serial No. 579,642

1 Claim. (Cl. 37—110)

The invention relates to a road grader and ditcher, as described in the present specification and illustrated in the accompanying drawings that form part of the same.

- 5 The invention consists essentially in the guiding, cutting, plowing and conveying mechanisms and their relative functions in breaking and making the road, as pointed out in the claim for novelty following a description in detail of the preferred arrangement and construction of the parts comprising the machine.

- 10 The objects of the invention are to construct machines operable under all conditions of the soil and equally suitable for urban, suburban and country road making and at the same time re-
 15 duce the cost of grading and eliminate much of the labor manually required for manual work; to adjust the mechanisms in order to meet conditions of the country through which the road
 20 is located and avoid the delays incidental to repairs and replacements often found necessary where these adjustments are absent and the parts less sturdy, thus minimizing the losses of the
 25 contractors and governments, and insuring the successful and economical carrying out of the work in accordance with the original estimates in so far as the grading is concerned; to utilize
 30 the principles of construction originally included in the showing and description of a grader in Patent No. 1,755,467 dated April 22, 1930, and
 afterwards in a Patent No. 1,795,360, patented March 10, 1931 and Patent No. 1,883,327 patented November 22, 1932, for improvements and to bring
 35 these early conceptions into more practical shape and present to the engineering world a reliable and efficient machine thoroughly tested and the result of the many experiments that have led up to its being; and generally to provide to govern-
 40 ments and others grading mechanism that will facilitate the construction of roads for highways or for urban, suburban or other communities at the lowest cost consistent with good work.

In the drawings, Figure 1 is a plan view of the machine.

- 45 Figure 2 is a side elevational view of the machine on the plow side.

Figure 3 is a side elevational view of the machine on the third wheel side.

- 50 Figure 4 is a side elevational detail of the plow and contiguous parts.

Figure 5 is a front elevational view of the plow and mechanism.

Figure 6 is a rear elevational view of the plow and mechanism.

- 55 Figure 7 is a detail of the conveyer support

showing the conveyer broken away and the contiguous parts at the delivery end of the plow mechanism.

Like numerals of reference indicate corresponding parts in the various figures.

Referring to the drawings, the main feature of the vehicle frame is the I-beam indicated by the numeral 15, and it is from this beam that the various bars extend, the bars 16 and 17 being connected and rigidly secured to said main beam and converging to the bearing structure 18.

A central brace 19 extends also from the main beam to the bearing structure and is rigidly secured.

The bracket 20 forms the means of rigidly securing the bar 16 to said main beam, this bracket being in the form of an I-beam having the plate 21 at the inner end.

The beam 22 extends from the main beam 15 and is rigidly secured thereto and terminates also at the bearing structure 18, to which it is rigidly secured.

The fender rail 23 is supported by the bar 24 from the bar 16 and the bar 25 from the main beam 15, and carries the hitching yoke 26, and this fender rail forms a support at one end for the bar extension 27 from the fork 28 secured to the bearing structure 18 and embracing the third wheel 29, this third wheel having a vertical adjustment operated by the wheel 30.

The outer end 31 of said bar extension extends through the outer end of the fender rail and is cushioned therein by the spring 32.

The bar 17 is elevated in respect to the main beam 15 and is connected to said main beam 15 by the upwardly inclined projecting beam 33 at the rear of the machine and this beam 17 provides a rest for the booms 34 and 35, which extend from the swivel mechanism 36 supported by said main beam.

This swivel mechanism 36 allows the swinging of the booms on the supporting bar 17 and the chain ends 37 drop from the booms to which they are attached and terminate in hooks 38 by means of which they are connected to the conveyer 39.

This conveyer 39 is formed of an endless belt 40 operating on the frame 41. This frame 41 has the chain ends 42 attached thereto and to the chain ends the hooks 38 are secured, being adjustable from link to link according to the particular incline desired for the conveyer 39, which is further determined by the inner slung end.

This inner slung end of the conveyer has the bar 43 with the eye 44 by means of which it is

held to the adjustable bracket 45. This bracket 45 carries a pin 46 on which the bar 43 is mounted through the eye 44.

The bracket 45 is in angle shape, one section of which is threaded as shown at 47 and this threaded end is mounted in the sleeve 48 and adjusted vertically by the winged nut 49.

The sleeve 48 is rigidly secured to a strap bracket 50 which is secured around the plow beam 51. This plow beam 51 is mounted in the hanger 52 and the hanger itself is suspended on the I-beam 15 through the oscillating bar 53 pivotally secured to the rigid cross bar 54, thus allowing for the hanger 52 a reasonable self adjusting movement in the lifting and lowering of the plow beam 51.

The strap bracket 50 is formed with an extension 55 riveted to the strap members and having a foot 56 secured to the plate 57 which approximates the landside in plow mechanism.

The hanger 52 is rigidly secured to this plate 57 and the foot 56, the three being riveted together while the colter 58 is also secured to this plate 57 and in turn the plow share 59 is secured to the colter and also the mold board 60, these two, the plow share and the colter are reinforced by the angle plates 61 at the back.

The plow share 59 is an elongated plate of rectangular form and constitutes a path to the mold board, which directs the dirt on to the conveyer 39 and it has been explained that the conveyer is adjustable in relation to the mold board for the different classifications of dirt.

This plow share is bent cornerwise forming the triangularly shaped section 62 for the cutting edge and spade end 63 and for guiding the dirt up the share which leans backwardly in substantially the same incline as the mold board, both share and mold board being inwardly curved at their inner ends 64 and 65.

The plow beam 51 is supported at the front end by the cable 66 attached to the ring 67 and runs on the pulleys 68 and 69 to the reel or drum 70 rotated by the spoke wheel 71.

This drops the point of the plow in position for digging purposes.

The rear end of the plow beam supported by the cable 72, is trained over the pulleys 73 to effect the raising and lowering of the wheel 74, and by means of this cable 72, attached to the eye 75 from the beam, the said beam may be raised and through the raising of the beam, the plow may be raised clear of the ground during the period when the machine is idle.

The sling rope or cable 76 is secured to the conveyer at either side and is trained over the pulleys 77 and 78 respectively secured to the frame of the machine and is engaged by the grooved roller 79 which is secured to the chain 80 hooked to the beam 22 thereby making the slack governing roller 79 adjustable in its relation to the cable 76, which means that the conveyer is so slung as to adjust itself nicely to the unevenness of the ground and the consequent more or less erratic movements of the plow mechanism in its operation in receiving and delivering the dirt to the conveyer.

The numeral 81 shows a motor mounted adjacent to the front of the frame and operatively connected to any part requiring its services, such as the flexible shaft connection 82 with the third wheel mechanism, which is not described in de-

tail herein, and the flexible shaft connection 83, with the conveyer mechanism, which is not described in detail herein.

The other wheels 84 and 85 of the running gear have novel features connected to them, but these form separate inventions and therefore are not described herein.

The oscillating bar 53, which is pivotally mounted, as explained, is braced from or braces the hanger 52 by means of the turnbuckle 86 and it will be noticed that the hanger will carry the plow beam up and it will also carry the oscillating bar up, though meanwhile, it is held in a suspended position by the cables at the ends.

The details of the conveyer have not been set forth herein though there are patentable features in connection with it, however, it is contended that the course of the dirt includes several features which are of novel formation, not so much as to the actual structural formation as to the principle of operation, though there are certain shapes and forms that contribute to the successful results in the machine and these are specifically novel.

In the operation of the machine, the usual thing is to employ a tractor, which is attached to the hitching yoke, very often by a long chain, so that the tractor can travel in a different path from the digging machine.

The plow share is dropped by means of lowering the forward end of the plow beam. This forward end digs into the ground and directs the dirt removed on to the plow blade or in other words, the plate of the plow share, and this plate, having an upward rearward inclination, the dirt continues on to the mold board and from the mold board on to the conveyer to which it has been previously adjusted in respect to distance, because in some classes of dirt, it is desirable to have the conveyer go above the mold board and in others it is desirable to have it go below, and again, in the ordinary dirt, it may be on a level with it, so this adjustment is quite important and facilitates the continuous operation.

The dirt is moved by the conveyer to the desired place on the roadway or to a truck. In any case, this delivery is really behind the machine and it is necessary frequently to spread the dirt by means of this conveyer, consequently, this spreading must be clear of the machine and it is especially desirable to build up part of the roadway in this particular manner.

The adjustability of the conveyer is thus quite a feature of the machine and this style of conveyer in its relation to the frame of the machine is part of previously patented constructions, though the course of the dirt is somewhat different in this invention and that concerns those parts of the invention for which protection is asked.

What I claim is:—

In a road grader and ditcher, a frame having a main beam and laterally extending beams to a third wheel structure and including an elevated beam forming a support, a pair of booms from a common swivel point resting on said main beam and adjustable on said elevated beam, a plow share and parts forming a path for the removed dirt and a conveyer slung to an adjusted position in relation to said parts and extended rearwardly offside from the straight line of direction.

SIGURD HANS BURNSTAD.