

(No Model.)

A. BARHITE.  
ROAD GRADING MACHINE.

No. 535,785.

Patented Mar. 12, 1895.

Fig. 1.

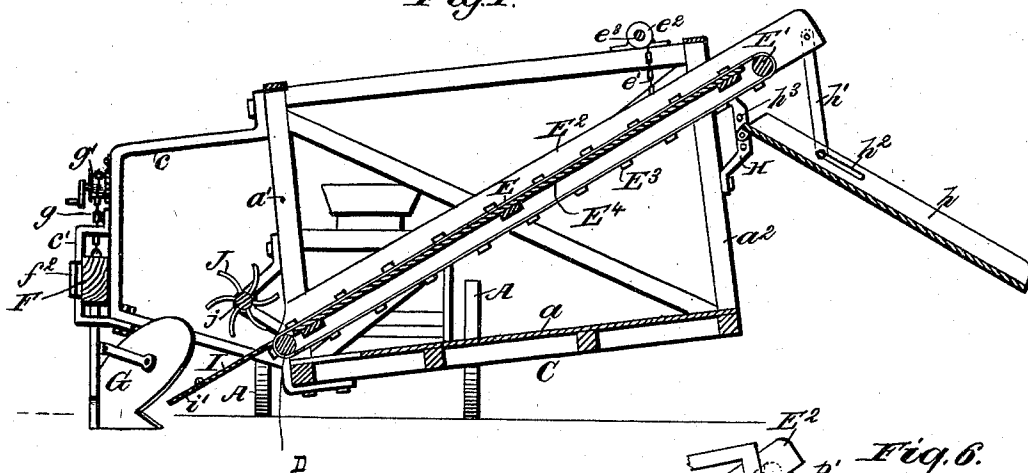


Fig. 2.

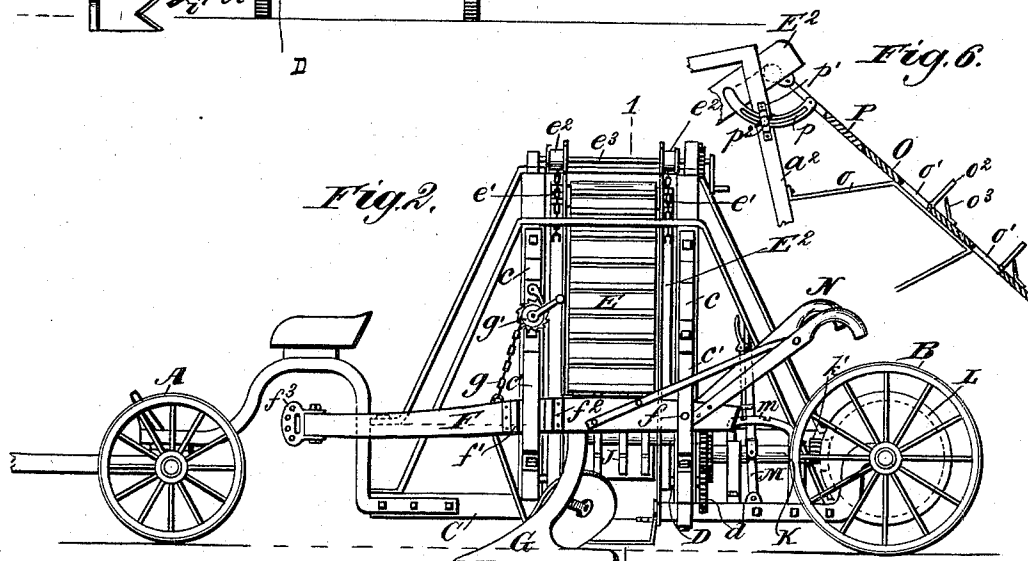


Fig. 6.

Fig. 3.

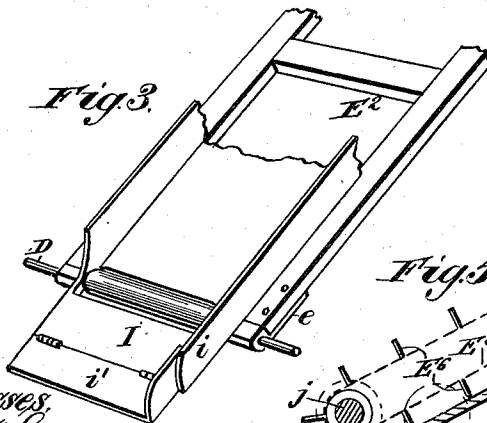


Fig. 5.

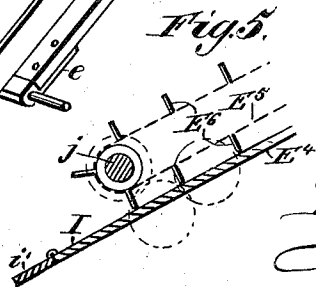
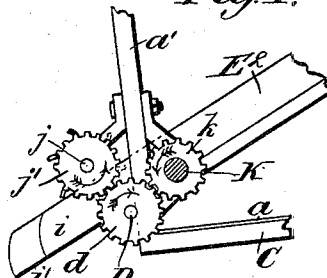


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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## ROAD-GRADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 535,785, dated March 12, 1895.

Application filed May 10, 1894. Serial No. 510,759. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER BARHITE, a citizen of the United States, residing at Toronto, in the Province of Ontario, Canada, have invented new and useful Improvements in Road-Grading Machines, of which the following is a specification.

My invention relates to an improved road grading machine wherein is employed a plow for breaking up or detaching the earth upon each side of the road, a conveyer for receiving the earth from the plow and depositing it in the center of the road, and mechanism for collecting the earth from the plow and directing it to the conveyer.

Referring to the drawings—Figure 1 is a transverse vertical section of my improved grading machine; Fig. 2, a side elevation thereof; Fig. 3, a detail perspective view of the lower end of the conveyer and the pivoted shoe; Fig. 4, a detail view of the gearing for driving the operative portions of the machine; Fig. 5, a detail view of a modified form of conveyer, and Fig. 6 a detail view showing a modified form of discharge chute.

Referring to the drawings the letter A indicates the front and the letter B the rear wheels of the machine upon which is supported and carried a frame C, consisting of a rectangular structure composed of a platform  $a$ , and side uprights  $a'$ ,  $a^2$ . Within the uprights  $a'$  is journaled a shaft D over which passes an endless belt or conveyer E which is similarly guided over a pulley or roll  $E'$  at the opposite or upper end of the elevator frame  $E^2$ .

The frame C is provided upon one side with outwardly projecting brackets  $c$  to each of which are secured straps or angle irons  $c'$  within which the beam F of the plow G rests, as will be more fully hereinafter described. The beam F of the plow rests loosely within the straps  $c'$  and is preferably secured to one of the uprights by a pivot pin or bolt  $f$ , though this pivot pin may be entirely omitted. When the pivot  $f$  is omitted means must be provided for resisting the end thrust of the plow beam when the machine is in operation, and for this purpose I fasten to the plow beam upon each side thereof and in front of the straps  $c'$  cleats or blocks  $f'$ , and in order to prevent longitudinal movement in

either direction, fasten similar cleats or blocks  $f^2$  to the beam in rear of said strap, the cleats or blocks  $f'$ ,  $f^2$ , being fastened sufficiently far in front and rear of the strap to permit of the vertical adjustment of the plow.

The plow may be of any ordinary or usual construction and need not be further described.

To the beam F of the plow, at a point in advance of the plow point, is secured one end of a chain  $g$ , the other end of which is wound about a drum  $g'$  journaled in one of the uprights  $c$ , and by means of which the angle at which the plow enters the ground may be controlled. The forward end of the beam F is provided with the usual clevis  $f^3$ , to which is harnessed a draft animal, a separate team being used for the draft of the machine proper.

The endless belt or conveyer E passes or travels above and below, or upon the opposite sides of a table or elevator frame  $E^2$  which at its lower edge is pivotally mounted by straps  $e$  upon the journals of the shaft D, and to the opposite or upper end of said frame  $E^2$ , to each side thereof, are secured chains  $e'$  which are wound about pulleys  $e^2$  carried by a winding shaft  $e^3$  mounted in suitable bearings on the frame C.

To one end of the frame C and upon each side thereof at points beneath the upper end of the elevator frame are secured brackets H to which is pivotally secured the upper end of a discharge chute  $h$  which is suspended from the upper end of the elevator frame  $E^2$  by links  $h'$ . Said links engage slots  $h^2$  in the sides of said chute, and the upper end of the chute is adjustably connected to either of a series of perforations  $h^3$  in the brackets H, for the purpose hereinafter described.

The lower end of the elevator frame  $E^2$  is provided with a downwardly inclined shoe I provided upon its rear side with an upturned edge  $i$  and having pivotally secured to its lower or outer edge a hinged extension  $i'$ , said shoe and hinged extension projecting beneath the upper edge of the mold board of the plow and acting to catch the earth as it falls therefrom.

In order that the earth may be conducted onto the endless apron or conveyer E, I provide the following mechanism: In suitable

brackets mounted on the uprights  $a'$ , at points above the shoe I is journaled a shaft  $j$  provided at its rear end with a gear wheel  $j'$  and provided with radial curved scraper arms J that are adapted to rotate in close proximity to the shoe. To the shaft D carrying the endless conveyer E is secured a gear wheel  $d$  which gears with the gear wheel  $j'$  and also with a similar gear wheel  $k$  mounted on a shaft K, the other end of the latter being provided with a pinion  $k'$  that is driven by a circular rack L carried by one of the rear wheels of the machine. The shaft K is made longitudinally adjustable in its bearings whereby it may be moved endwise to throw the gear wheel  $k$  in and out of gear with the wheel  $d$ , a pivoted lever M and segmental rack  $m$  being provided for the purpose.

As thus constructed the operation of my improved device is as follows: One team is harnessed to the draft pole of the machine and another to the plow clevis. The depth and angle of penetration of the plow point is adjusted by raising or lowering the forward end of the plow beam by means of the chain  $g$ . The machine is to be driven in such manner that the plow runs along one side of the road and as it throws up the earth onto the shoe I the rotary drum J grasps it and sweeps it onto the lower end of the elevator E by which it is carried up and dropped onto the chute  $h$ , by which latter it is discharged onto the center of the roadway. By raising or lowering the upper end of the elevator frame  $E^2$  the inclination of the chute is automatically adjusted to drop the earth at the point desired, and the adjustment may be still further varied by changing the pivot pins of the chute from one to another of the series of apertures in the brackets H. By disconnecting the chute the entire elevator frame may be bodily lowered onto the platform  $a$  of the frame C for transporting the machine, the hinged extension  $l'$  of the shoe  $l$  folded back out of the way, and the plow raised so as to clear the roadway. The gearing is then to be thrown out of action as before described.

If desired handles N may be secured to the plow beam in the usual manner to aid in operating the plow in the well known way.

In Fig. 1 I have shown the conveyer as consisting of an endless belt apron E carrying a series of transverse slats  $E^3$ , but in lieu thereof I may provide the elevator frame  $E^2$  with a table  $E^4$  and employ an endless apron  $E^5$  provided with scraper arms  $E^6$  to carry up the earth to the chute.

In Fig. 1 I have shown the discharge chute as consisting of a shoe hinged to the side of the frame of the machine and suspended from the upper end of the conveyer frame  $E^2$  by means of links  $h'$ . In Fig. 6, however, I have shown a modified form of discharge chute which I will now describe. Referring to said figure  $a^2$  indicates the frame of the machine and  $E^2$  the elevator frame constructed and arranged in the manner before described. O

indicates an inclined table rigidly secured to the side of the frame  $a^2$  at a point below the discharge end of the carrier  $E^2$  by means of brace rods  $o$ , and is provided with a series of apertures  $o'$  which are closed by hinged lids or covers  $o^2$  which open upwardly, and when open rest against stays or stops  $o^3$ . To the upper end of the conveyer frame  $E^2$  is hinged a leaf P, to the under side of which are rigidly secured curved arms  $p$  which pass through suitable guides  $p'$  secured to the sides of the elevator frame  $E^2$  and are held therein at the desired adjusted position by means of set screws  $p^2$ . The lower end of the leaf P, when the latter is swung outward, abuts against the upper edge of the inclined table O, the one forming a continuation of the other. When the leaf P is dropped or swung inward the earth falling from the elevator E drops through the opening between said leaf and the inclined table O. When it is desired to deposit the earth farther away from the machine the leaf is raised or swung outward and one of the hinged lids or covers  $o^2$  is raised. The earth then falls down the chute until it is arrested by the raised lid and then drops through the aperture in front of the lid to the ground. By providing a series of lids  $o^2$  the excavated earth may be discharged at any desired point beneath the chute.

I wish it to be understood that I do not confine myself to the particular forms of endless carrier and discharge chute I have shown and described, as I may employ any known form of either without departing from the spirit of my invention.

Having described my invention, what I claim is—

1. In a road grading machine, the combination with a wheeled carriage carrying a frame, of a plow adjustably mounted on said frame, a transverse inclined conveyer provided at its lower end with a shoe having a hinged extension upon which the plow deposits the earth, and at its upper end with an adjustable discharge chute, substantially as described.

2. In a road grading machine, the combination with a wheeled carriage carrying a frame, of a plow adjustably mounted on said frame, a transverse inclined endless conveyer adjustably secured within said frame and provided at its lower end with a shoe having a hinged extension upon which the plow deposits the earth and at its upper end with a downwardly inclined discharge chute adjustably connected to said frame and conveyer, and means for holding said chute in its adjusted position, substantially as described.

3. In a road grading machine, the combination with a wheeled carriage carrying a frame, of a plow mounted on said frame, a transverse, inclined endless conveyer supported within said frame, and a discharge chute consisting of an inclined table rigidly secured to one side of said frame and having a series of discharge openings provided with hinged covers, and an adjustable leaf hinged to the discharge

end of the elevator frame and means for holding it in its adjusted position, substantially as described.

4. In a road grading machine, the combination with a wheeled carriage carrying a frame, of a plow mounted on said frame, a transverse inclined endless conveyer mounted within said frame and provided at its lower end with a shoe projecting beneath the mold board of the plow, a rotary drum arranged transversely above said shoe between the mold board and the conveyer and operating to transfer the earth from the shoe to the conveyer, and mechanism for actuating said drum and conveyer, substantially as described.

5. In a road grading machine, the combination with a wheeled carriage carrying a frame of a plow mounted on said frame, a conveyer platform arranged transversely within said frame and pivoted therein at its lower end and suspended at its upper end by chains carried by a winding drum, an endless conveyer arranged upon said platform, a shoe carried by the lower end of the platform and projecting under the mold board of the plow, a rotary drum journaled transversely above said shoe, and mechanism for actuating said drum and conveyer, substantially as described.

6. In a road grading machine, the combination with a wheeled carriage carrying a frame, of a vertically adjustable plow secured to said frame, a transverse inclined endless conveyer

mounted within said frame, a rotary drum journaled between the lower end of the conveyer and the mold board of the plow and provided with radial, curved scraper arms, and mechanism for actuating the conveyer and drum, substantially as described.

7. In a road grading machine, the combination with a wheeled carriage carrying a frame, of a vertically adjustable plow secured to said frame, a conveyer platform arranged transversely within said frame and carrying an endless conveyer, a driving shaft for actuating the conveyer arranged at the lower end of said platform and provided with a gear wheel, a rotary drum journaled above the lower end of the conveyer and provided with a gear wheel meshing with the gear wheel on the conveyer shaft, a longitudinally movable shaft provided at one end with a gear wheel meshing with the said last named gear wheel, and at its opposite end with a pinion gearing with a circular rack carried by one of the rear wheels of the carriage, and means for moving said gear shaft longitudinally, substantially as shown and described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

ALEXANDER BARHITE. [L. S.]

Witnesses:

THOS. A. GREEN,  
JAMES L. NORRIS.