E. L. LATHROP.

ROAD MAKING MACHINE.

APPLICATION FILED FEB. 6, 1909.

940,169.

Patented Nov. 16, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

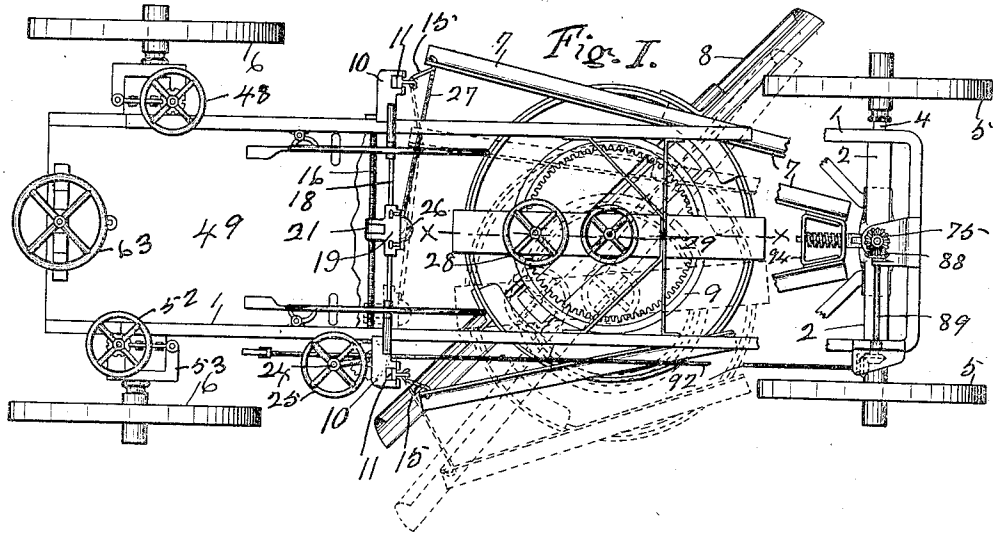
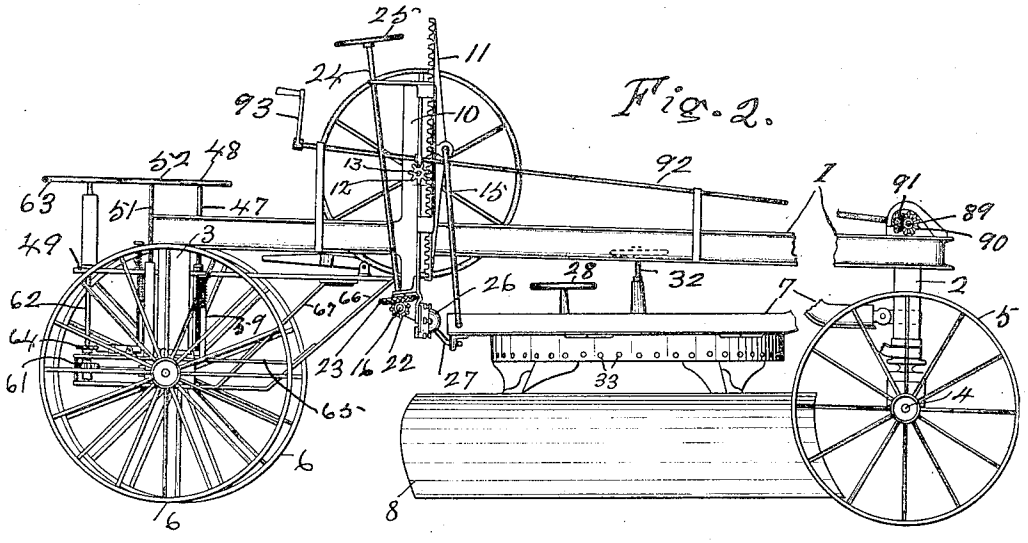


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

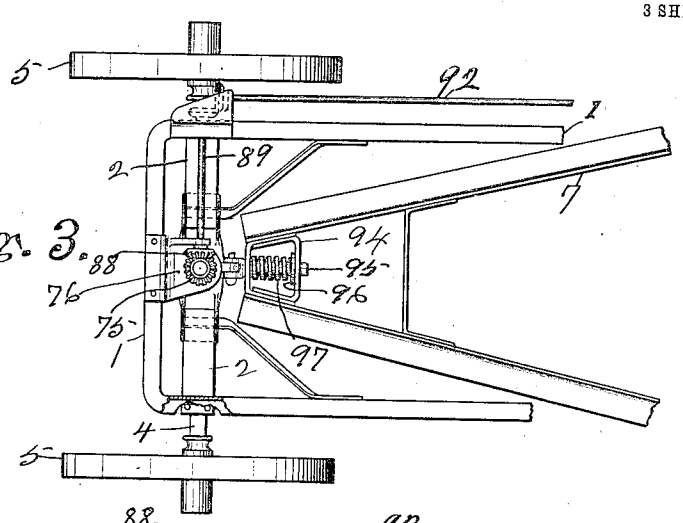


Fig. 4.

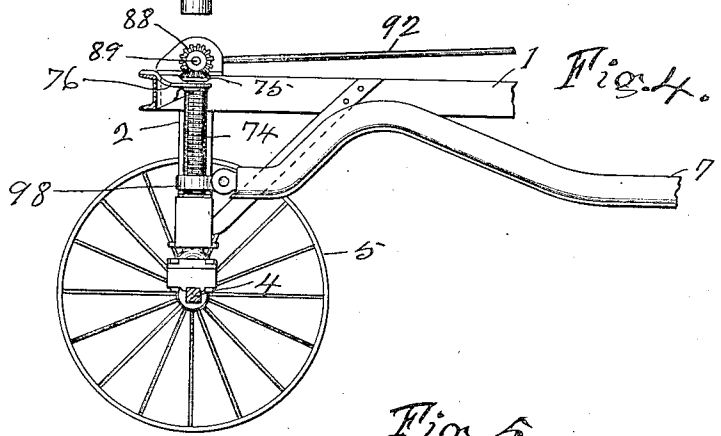
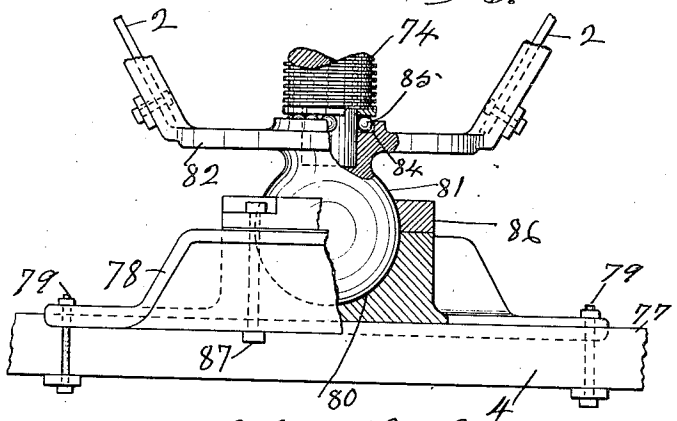


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 6.

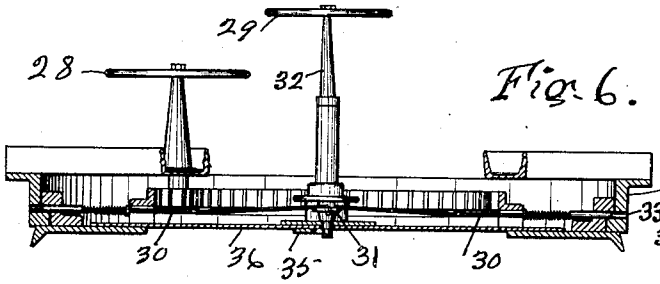


Fig. 7.

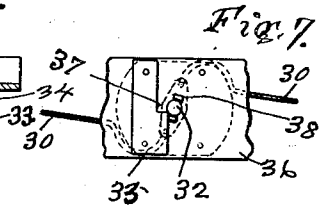


Fig. 8.

Fig. 9.

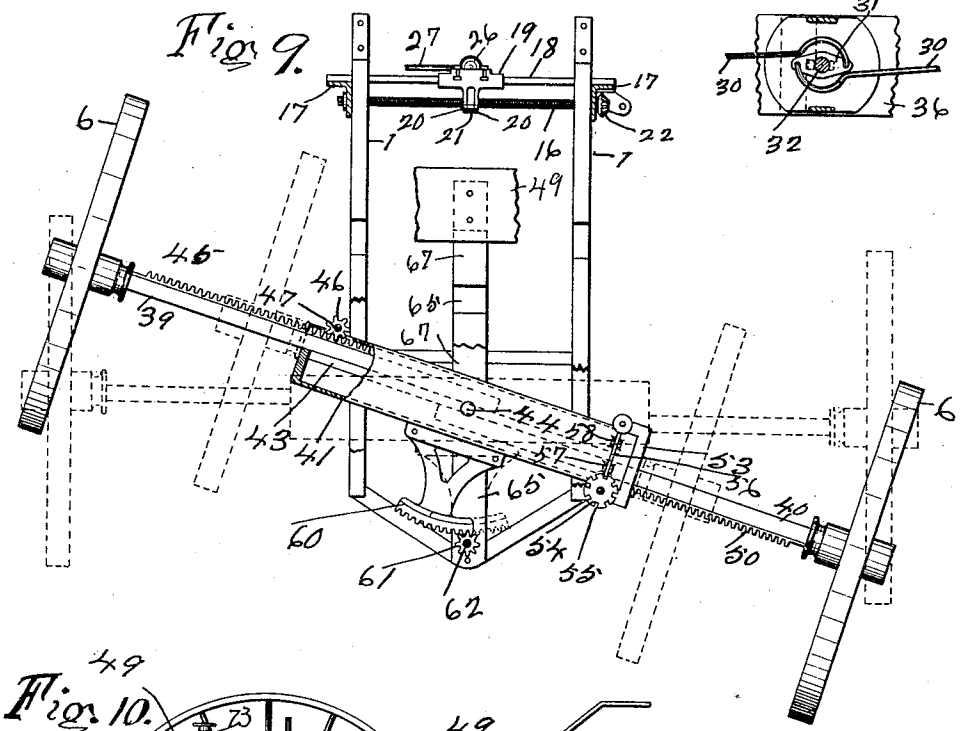
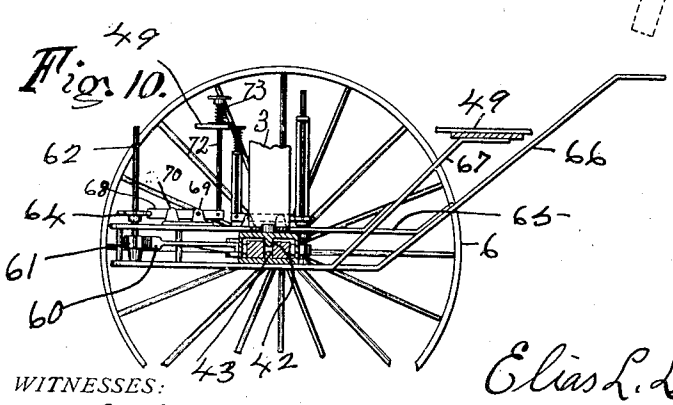


Fig. 10.



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UNITED STATES PATENT OFFICE.

ELIAS L. LATHROP, OF GALION, OHIO.

ROAD-MAKING MACHINE.

940,169. Specification of Letters Patent. Patented Nov. 16, 1909.

Application filed February 6, 1909. Serial No. 476,556.

To all whom it may concern:

Be it known that I, ELIAS L. LATHROP, a citizen of the United States, residing at Galion, in the county of Crawford, in the State of Ohio, have invented certain new and useful Improvements in Road-Making Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in road making machines.

The primary object of my present invention is to provide a road making machine having an improved pivoted and extensible rear axle with a novel and convenient means for actuating the same; improved means for laterally shifting or adjusting the scraper blade; an improved and simplified means for raising and lowering the front end of the draw-bars in adjusting the scraper-blade; and an improved locking means for preventing the turning of the blade unlocking means the wrong way in use.

The principal novel features will be hereafter set forth in the claims.

Similar reference numerals indicate like parts throughout the several views in which—

Figure 1 is a plan view of my invention partly broken away, showing the relative arrangement of the operative parts, and showing in dotted lines another adjustment of the scraper-blade. Fig. 2 is a side view of Fig. 1, showing the general arrangement of the scraper-blade adjusting mechanism. Fig. 3 is a plan view of the front end of the machine showing the means for elevating the forward end of the draw-bars. Fig. 4 is a side view of the same partly in cross-section. Fig. 5 is an enlarged fragmentary detail of the lower end of the means for raising the forward end of the draw-bars, and the means for securing it in operative position partly in section. Fig. 6 is a central section of the scraper-blade supporting ring taken on the line x—x of Fig. 1, to show the means for securing the blade in any desired adjustment, the locking means being shown as withdrawn. Fig. 7 is a bottom plan view of the means for preventing the operation of the locking means in the wrong direction. Fig. 8 is a top plan of the same showing the parts in the other limit of their position. Fig. 9 is a top plan of the rear portion of the machine showing the pivoted rear axle extended to its outer limit, and shown in dotted outline in two other positions, the axle-box being partly in section, and the means for operating the pivoted axle being shown in part. Fig. 10 is a cross-section of the rear axle and the axle-box showing the general arrangement of the adjacent operative parts.

The main frame 1 of channel iron and of the usual construction and arrangement is mounted on the running gear by the usual upright standards 2 and 3. The front axle 4, the ground wheels 5 and 6, the draw-bars 7, scraper-blade 8 and its supporting ring 9 are all of the usual or other proper construction.

The main frame 1 has near its rear end and upon each side thereof the integral upright standards 10 in which the vertical racks 11 are slidably mounted. The racks are actuated in the usual manner by the respective pinions 12 fixed on the outer end of the short shafts 13 whose inner ends have the usual operating wheel 14, Figs. 1 and 2. The raising and lowering of the racks 11, of course, give the rear end of the draw-bars and the pendent blade the desired vertical adjustment. The rear ends of the draw-bars are pivotally connected to the respective racks 11 as usual by the pendent rods 15.

The means for laterally shifting the blade 8 consists of a horizontal transverse screw 16 loosely mounted in suitable bearings in the lateral brackets 17, Fig. 9, fixed on the outer sides of the frame 1. To the forward face of the brackets 17 are rigidly fixed the opposite ends of the bar 18 on which the boxing 19 is slidably mounted. The boxing 19 has its rear face provided with a pair of apertured ears 20 through which the screw 16 passes loosely. Between the ears 20 is arranged a bur 21, Fig. 9, which is mounted on the screw 16 by a screw-threaded connection.

On one end of the screw 16 is fixed a bevel pinion 22 adapted for a meshing engagement with the bevel gear wheel 23 fixed on the upright operating shaft 24 having a fixed hand wheel 25 upon its upper end.

On the forward face of the boxing 19 is arranged a socket in which the ball 26 is loosely mounted. The ball 26 is fixed upon

the adjacent end of the horizontal rod 27, whose other and outer end is pivotally connected to the rear end of the draw-bars. By the ball and socket bearing of the inner end of the rod 27, a free action thereof is secured and all tendency toward binding is obviated.

The blade supporting ring 9 has the usual hand-wheel 28 for rotating the same, and has a second hand wheel 29 for locking and unlocking the same in the usual manner by means of the oppositely arranged rods 30 whose inner ends are loosely secured to the respective ends of the plate 31 Fig. 8 fixed on the lower end of the upright shaft 32, all being of well known construction. The outer ends of the rods 30 lock the rotatable blade supporting ring in the usual manner by entering peripheral openings 33 in the fixed outer ring 34. The hand wheel 29 is fixed on the upper end of the shaft 32.

It is well known that a heedless or inexperienced operator sometimes inadvertently turns the hand wheel 29 the wrong way when they are in locked positions as shown in Fig. 7, thereby bending the rods 30, and temporarily disabling the machine. My present means for preventing such a derangement of the ring locking means consists of a plate 35 fixed to the lower face of a suitable stationary support 36 in which the lower end of the shaft 32 is loosely mounted and supported. The plate 35 has upon one edge thereof adjacent to the shaft 32 a notch 37.

The lower end of the shaft 32 has a fixed diametric pin 38 whose opposite ends are adapted to engage the notch 37 at the respective limits of rotation of the shaft 32, whereby when the ring is locked and the parts are in the position shown in Fig. 7, any further rotation of the shaft in the direction for locking the same is prevented by the engagement of one end of the pin 38 with the edge of the plate 35 at the notch therein, and when the rods 30 are withdrawn and in their unlocked position, Fig. 8, any further rotation of the shaft 32 is prevented by the engagement of the other end of the pin 38 with the notch 37, thereby preventing any undue strain upon rods 30 under any conditions of service.

The longitudinally extensible rear axles 39 and 40, of similar and common construction, are slidably mounted as usual in parallel arrangement in a common form of axle box 41, Fig. 9. The axles 39 and 40 are separated by a pair of opposite flanges 42 and 43 on the inner face of the top and bottom respectively of the axle box 41 which is pivotally mounted midway of its ends and sides on the vertical pivot 44.

The axle 39 has a common form of longitudinal rack 45 upon its front face in mesh with an actuating pinion 46 fixed upon the lower end of the vertical operating shaft 47 having a fixed hand-wheel 48 upon the other end thereof, by means of which the coöperating axle is adjusted in the usual manner, and the axle 40 has a suitable longitudinal rack 50 upon its rear face in mesh with an actuating pinion, not shown, fixed on the lower end of the vertical shaft 51 carrying upon its upper end a fixed hand wheel 52 by means of which the axle 40 is longitudinally shifted in the usual manner.

At a proper distance above the axle box is fixed a horizontal platform 49 upon which the operator stands.

On each end of the axle box 41 is fixed a bracket 53 in one end of which is revolubly mounted the vertical shaft 47, carrying a fixed disk 54 having its perimeter provided with a series of notches 55 adapted to form a holding engagement with the adjacent end of the lever 56 arranged between the guide lugs 57 on the upper face of the axle box, and pivotally fulcrumed between the lugs 58 thereon, and has its other end pivotally connected to its respective upright pedal rods 59, whereby each axle is normally locked against longitudinal movement as usual.

To the rear face of the axle box and midway of its ends is fixed a segmental rack 60 in mesh with a pinion 61 fixed on the lower end of the vertical shaft 62 carrying upon its upper end an operating hand-wheel 63, and also provided near its lower end with a fixed concentric disk 64 peripherally notched, and similar to the disks 54.

An upwardly bent plate 66 has its upper and forward end fixed to platform 49, and has its rear and lower end fixed to the axle box 41. A second similarly bent plate 67 has its upper end secured to the lower face of the platform 47 and has its central portion fixed to the lower face of the axle box, and has its rear extended end rigidly connected to the rear end of a parallel plate 65 whose forward end is fixed to the rear face of plate 67. In suitable openings in the plates 65 and 67 is revolubly mounted the lower end of the said shaft 62.

On the upper face of the plate 65 is pivotally fulcrumed the pedal lever 68 in the lugs 69 and between the guide lugs 70, and whose rear end is normally in a locked engagement with the disk 64 to prevent rotation of the pinion 61. In a suitable opening in the platform 49 is loosely mounted a vertical pedal rod 72, normally secured in the uppermost limit of its movement by the coil spring 73 upon its upper end in the usual manner Fig. 10.

It is obvious that the operator by the manipulation of the hand-wheel 63 can readily swing the rear axles with their containing box 41 together on the pivot 44 by the actuating engagement of the pinion 61 with the segmental rack 60, instead of swinging each axle separately as heretofore.

My improved means for raising and lowering the front end of the drawbars consists of an upright screw head 74 of proper strength and dimensions, carrying upon its upper end a fixed bevel gear wheel 75 below which is secured the inner end of the plate 76, the other end being fixed to the forward end of the main frame 1.

On the upper face of the front axle 77 midway of its ends is mounted a casting 78 rigidly secured thereto by the bolts 79, and is provided with a semi-spherical socket 80 to loosely receive the ball 81 which is integral with the bolster 82 of common construction to the ends of which are rigidly bolted the lower ends of the diagonal braces 83 whose upper ends are bolted to the lower flange of the main channel iron frame, Fig. 3. The bolster is also provided midway of its ends with a circular opening to loosely receive the reduced circular end of the screw head 74, Fig. 5, and is also provided with a circular ball race 84 in which are arranged a series of antifriction balls 85 upon which the weight of the screw-head rests and turns freely. The bolster is secured in position upon the front axle by means of the collars 86 which is arranged above the center of the ball 81, and is rigidly secured in position by means of the bolts 87, or other proper manner. The screw head 74 thus rotatively mounted is actuated by the engagement of the bevel gear wheel 88 with the bevel gear 75. The gear 88 is fixed upon one end of the horizontal shaft 89, and the bevel gear wheel 90 is fixed on the other end of the shaft 89, and forms a meshing engagement with the actuating gear 91 fixed as usual on the forward end of the long rearwardly extended shaft 92 provided upon its rear end with an operating crank-handle 93.

The forward end of the drawbars 7 has a fixed frame 94 provided with opposite openings in its front and rear sides in which is loosely mounted a bolt 95 having a rigid collar 96 and a surmounted coiled spring 97, and having a bifurcated head on its forward end in which the rearward extension of the bur 98 is pivotally secured. The bur 98 has a screw threaded connection with the screw-head 74 and is adjusted up or down thereon at pleasure by the revolution of the said screw head therein.

The operation of my invention thus described is obvious and briefly stated is as follows: To secure a lateral shifting of the scraper blade in either direction the operator simply rotates the hand-wheel 25 thereby actuating the screw shaft 16, and thereby adjusting the boxing 19 thereon, thus carrying with it the rear end of the draw bars through the medium of the rod 27. It is evident that by the use of the screw 16 the operator not only has a secure, convenient and reliable blade shifting means, but he is able to readily make any desired lateral adjustment of the blade while the machine is in motion instead of having to stop the machine as at present. It is also evident that by providing the inner end of the rod 27 with a ball and socket joint it is relieved of all the usual strains and turns freely under all conditions of service, and that the forward wheels can run over a stone, clod or other obstacle without interfering a particle with the operation of the blade.

It is obvious that the means described for limiting the rotary movement of the blade-ring locking plate 31 to a one-fourth turn absolutely prevents all danger of bend or derangement of the locking rods 30, by the usual inadvertence or inexperience of the operator.

It is obviously a marked advantage to pivot the containing box for the rear extensible axles at its center and thereby swing both axles and box all together, instead of pivoting each axle separately as at present. The means disclosed for this purpose is positive, simple and reliable.

It is also obvious in my improved screw-head 74 the necessity of the usual post and screw is obviated, as my screw-head performs the functions of both, and the ball and socket support for the forward bolster gives a freedom of movement for the front axle, as in passing over obstructions, which very materially relieves the front end of the main frame of the usual racking and torsional strains.

Having thus described my invention and the manner of employing the same what I desire to secure by Letters Patent is:

1. In a road making machine means for laterally adjusting the scraper blade, consisting of a transverse rotatable screw; means for actuating the screw; a nut or bur mounted on the screw by a screw threaded connection; a fixed bar in parallel relation to the screw and forward thereof; a boxing slidably mounted on the bar, and having a socket on its front face, and provided upon its rear face with a pair of apertured ears embracing the bur and loosely receiving the said screw; and a rod having a ball on its inner end adapted to form a bearing in the socket of the boxing, and having its other end pivotally connected to the blade supporting means.

2. In a road making machine, means for laterally shifting the scraper-blade supporting means, consisting of a transverse revoluble screw; means for actuating the screw; a nut or bur mounted on the screw; a boxing having a locked engagement with the nut, and slidably mounted on a suitable support; and means for connecting the boxing to the blade supporting means by a ball and socket joint.

3. In a road making machine, means for

limiting the rotary movement of the blade locking means for the purpose specified, consisting of means upon the lower end of the upright operating shaft for limiting the same to a quarter revolution.

4. In blade locking means, a vertical rotary shaft provided upon its lower end with a diametric pin with extended ends; a plate fixed on the shaft above the said pin; locking means connected to the ends of the said plate; and means fixed in coöperative relation with the said pin for limiting the shaft to a quarter turn.

5. In a road making machine an extensible rear axle consisting of an axle box centrally pivoted, and provided upon its rear face and midway of its ends with a segmental rack; a pair of axles slidably mounted in the axle box and provided upon one face thereof with a longitudinal rack; means for actuating the said axles longitudinally; and means for rotating the axle box on its pivot fulcrum.

6. The combination of a pivotal axle box; a pair of axles longitudinally extensible into and out of the box; means for rotating the axle box; means for locking it in any desired position of adjustment; and means for actuating the axles into and out of the box.

7. In a road making machine, means for raising and lowering the front end of the drawbars consisting of a bracket fixed on the front axle and having a socket on its upper face; a bolster having a centrally arranged pendent ball having a bearing in the socket and provided with a central recess; a vertical screw head revolubly mounted in the socket; means for actuating the screw head; and a nut mounted on the screw head, and pivotally connected to the drawbars.

Signed by me at Fort Wayne, Allen county, State of Indiana, this 3rd day of February, 1909.

ELIAS L. LATHROP.

Witnesses:
AUGUSTA VIBERG,
AUGUSTE SPIEGEL.