

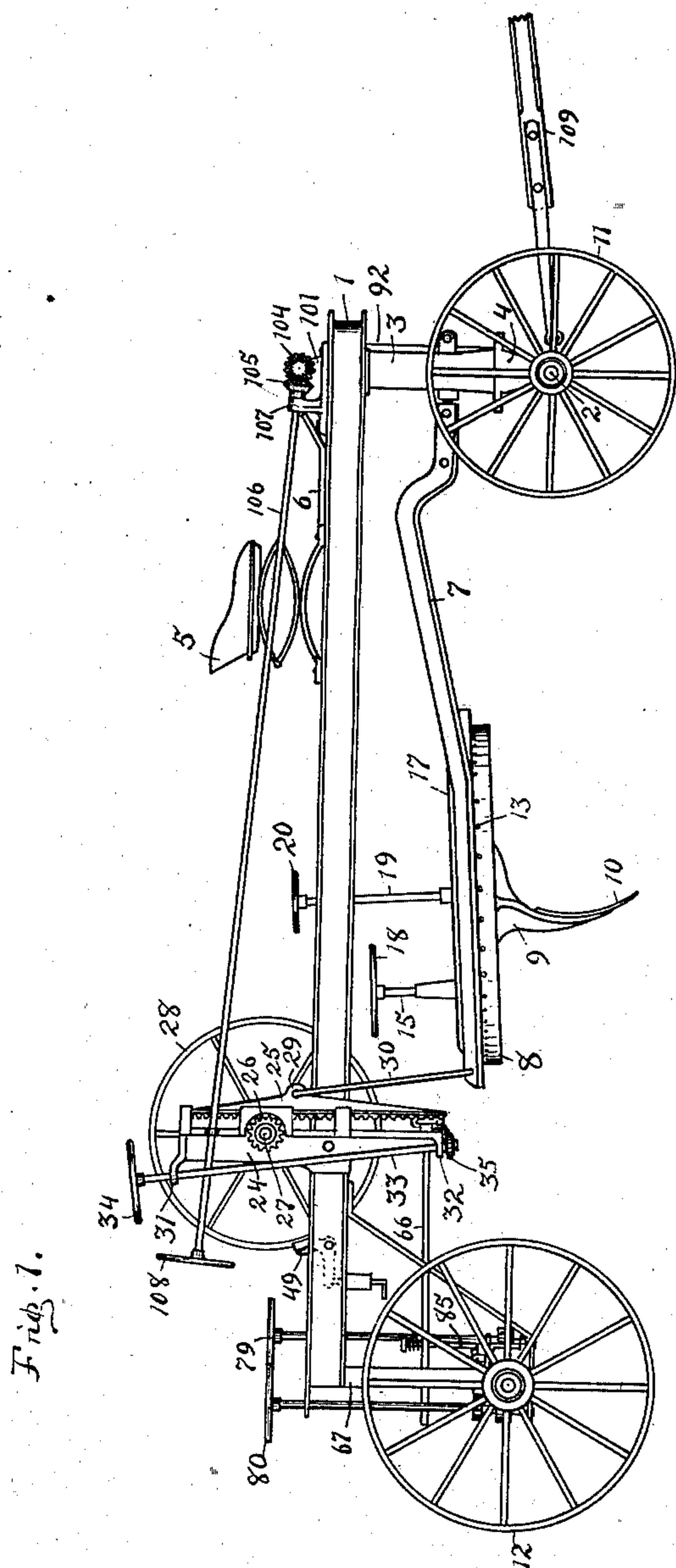
No. 749,617.

PATENTED JAN. 12, 1904.

E. L. LATHROP.
ROAD MAKING MACHINE.
APPLICATION FILED JULY 6, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



WITNESSES:

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Augusta Viberg.

Elias L. Lathrop

INVENTOR

BY *Chapin & Denny*

Att. ATTORNEYS.

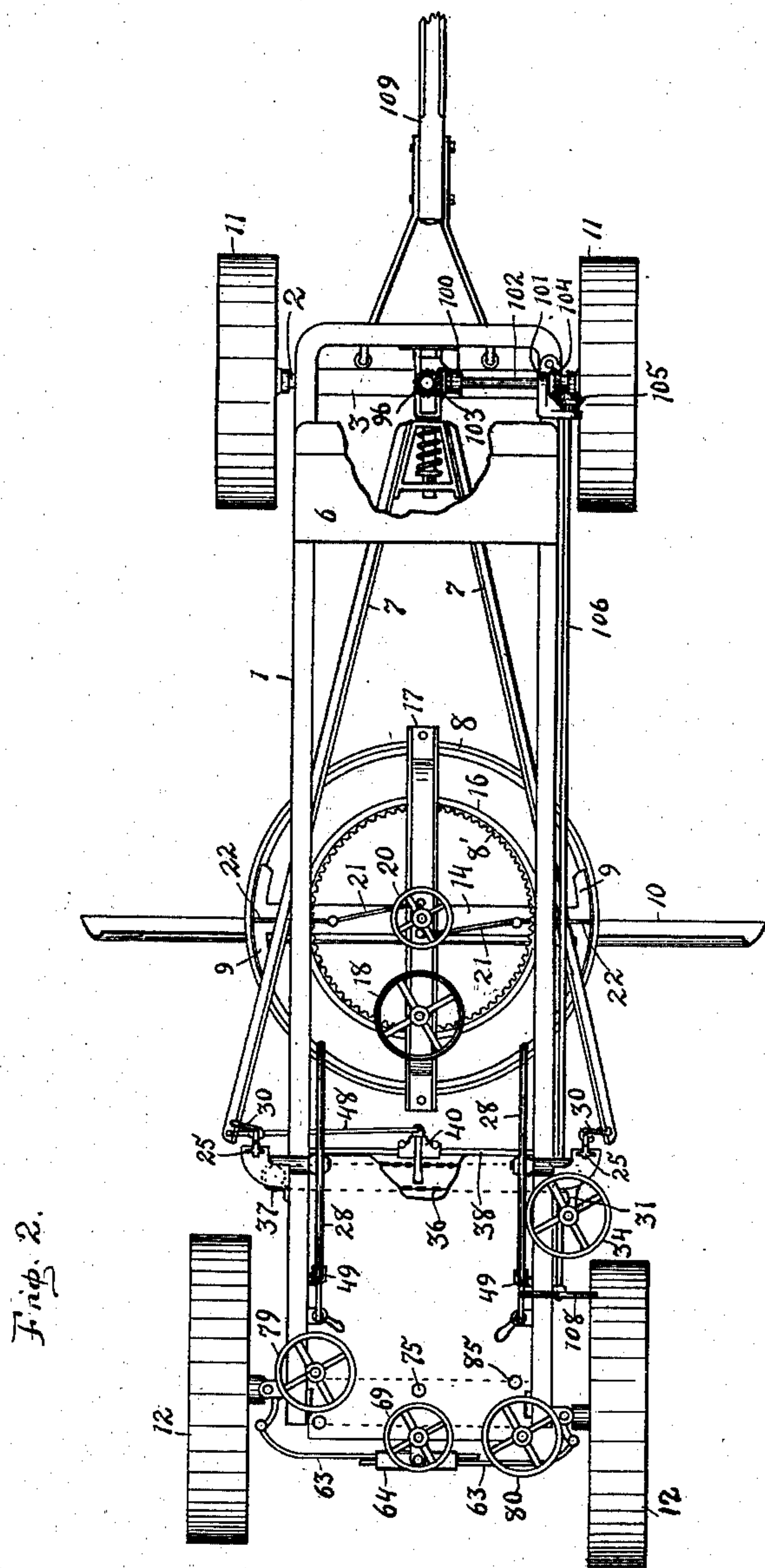
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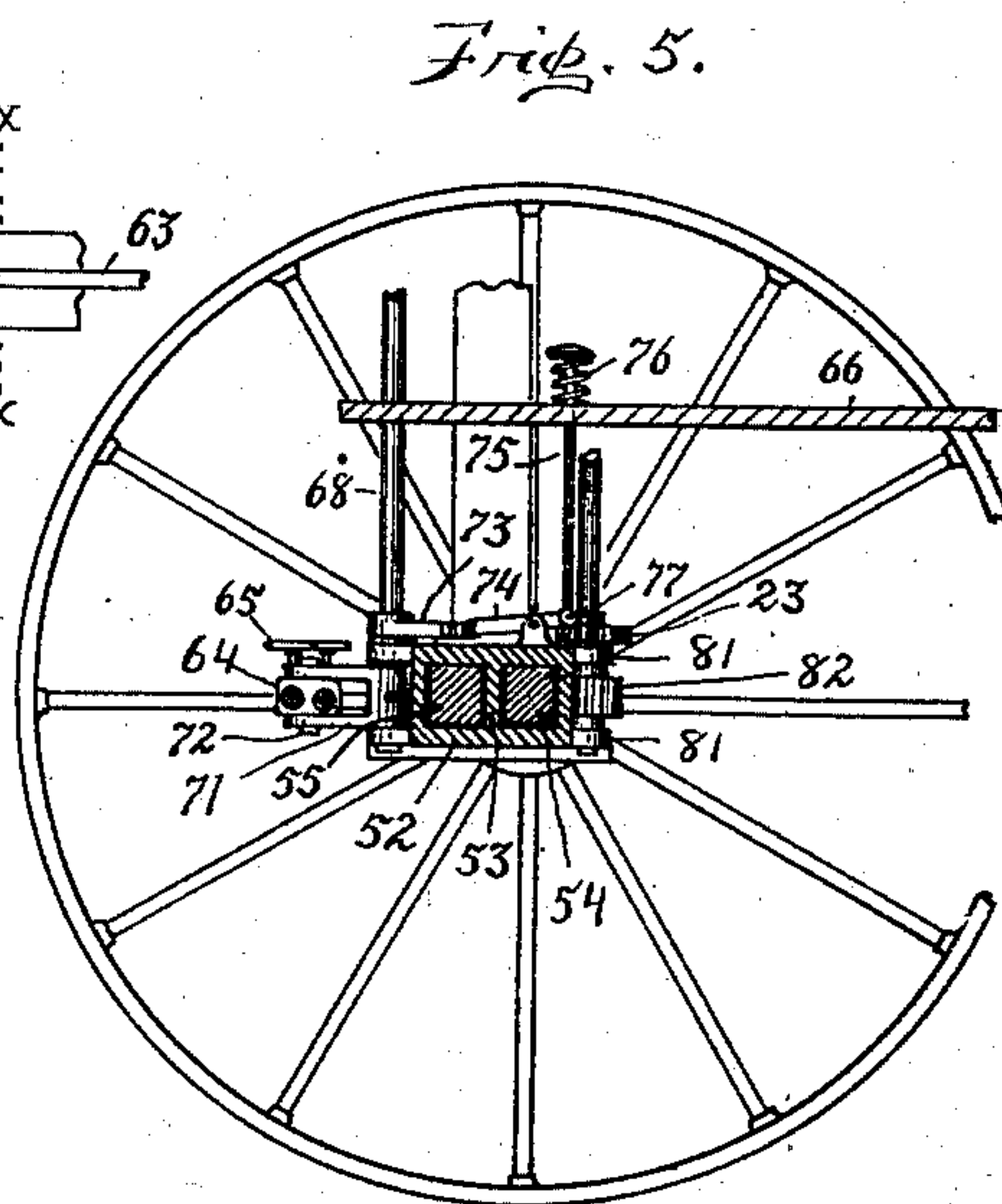
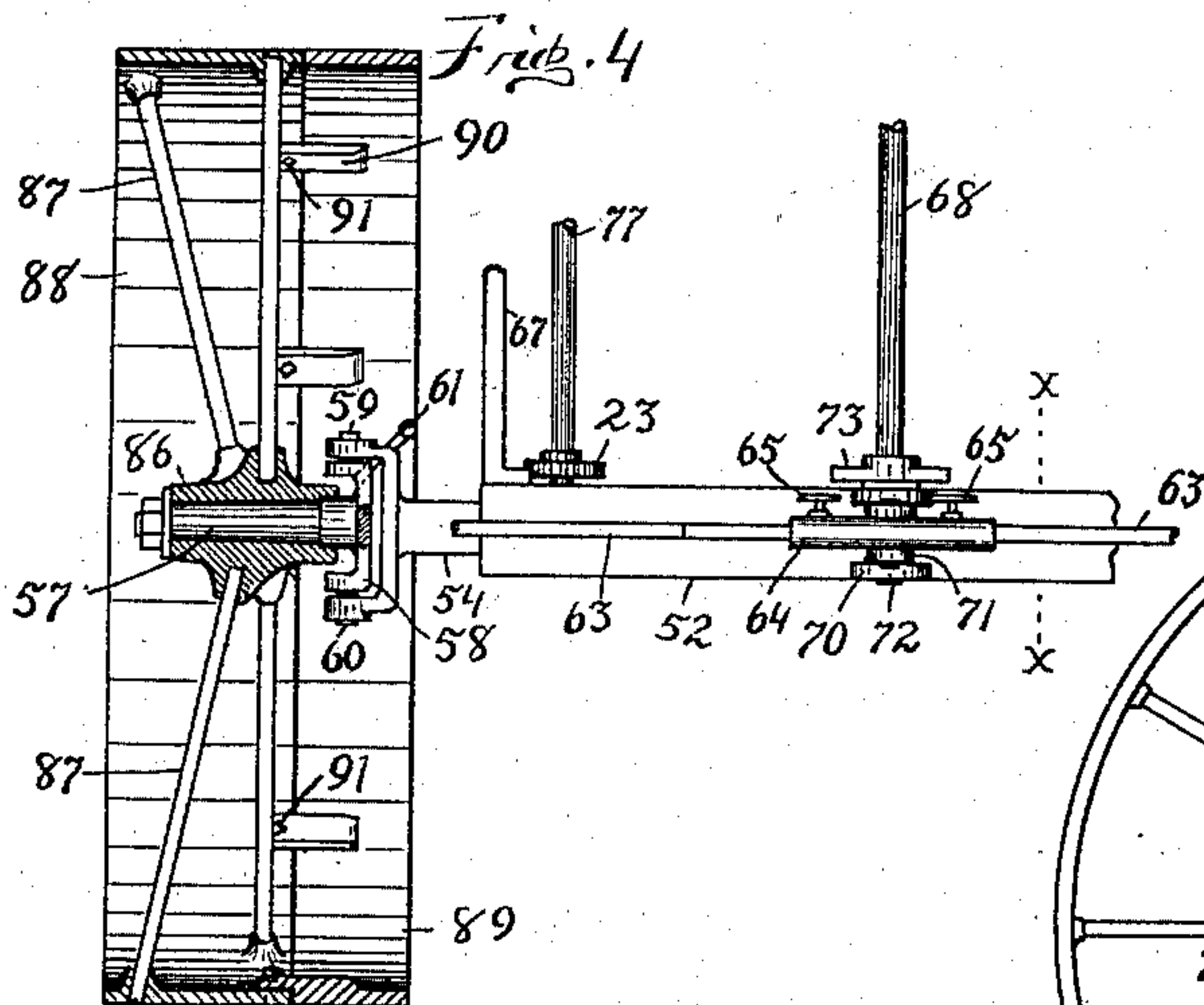
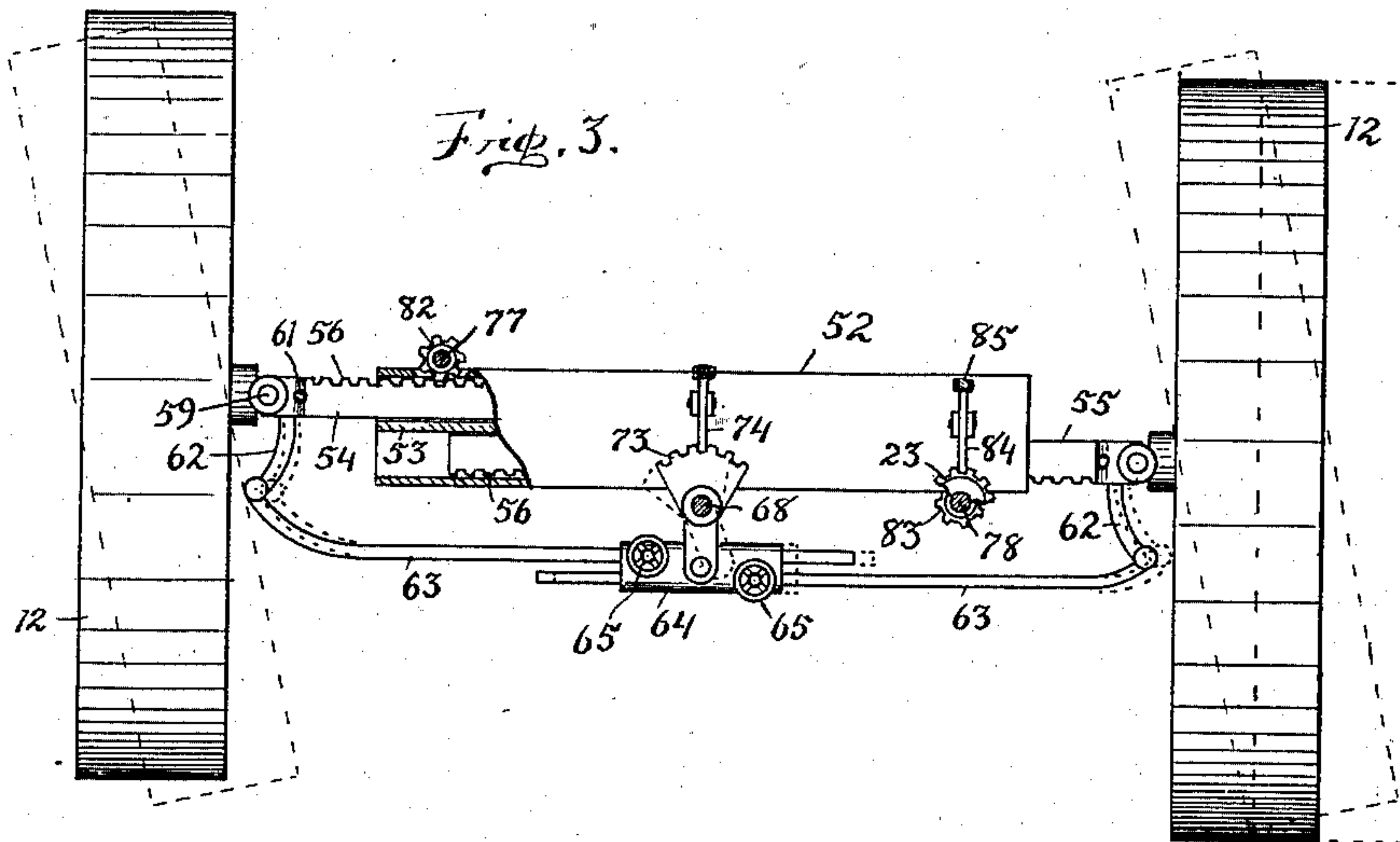
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 6.

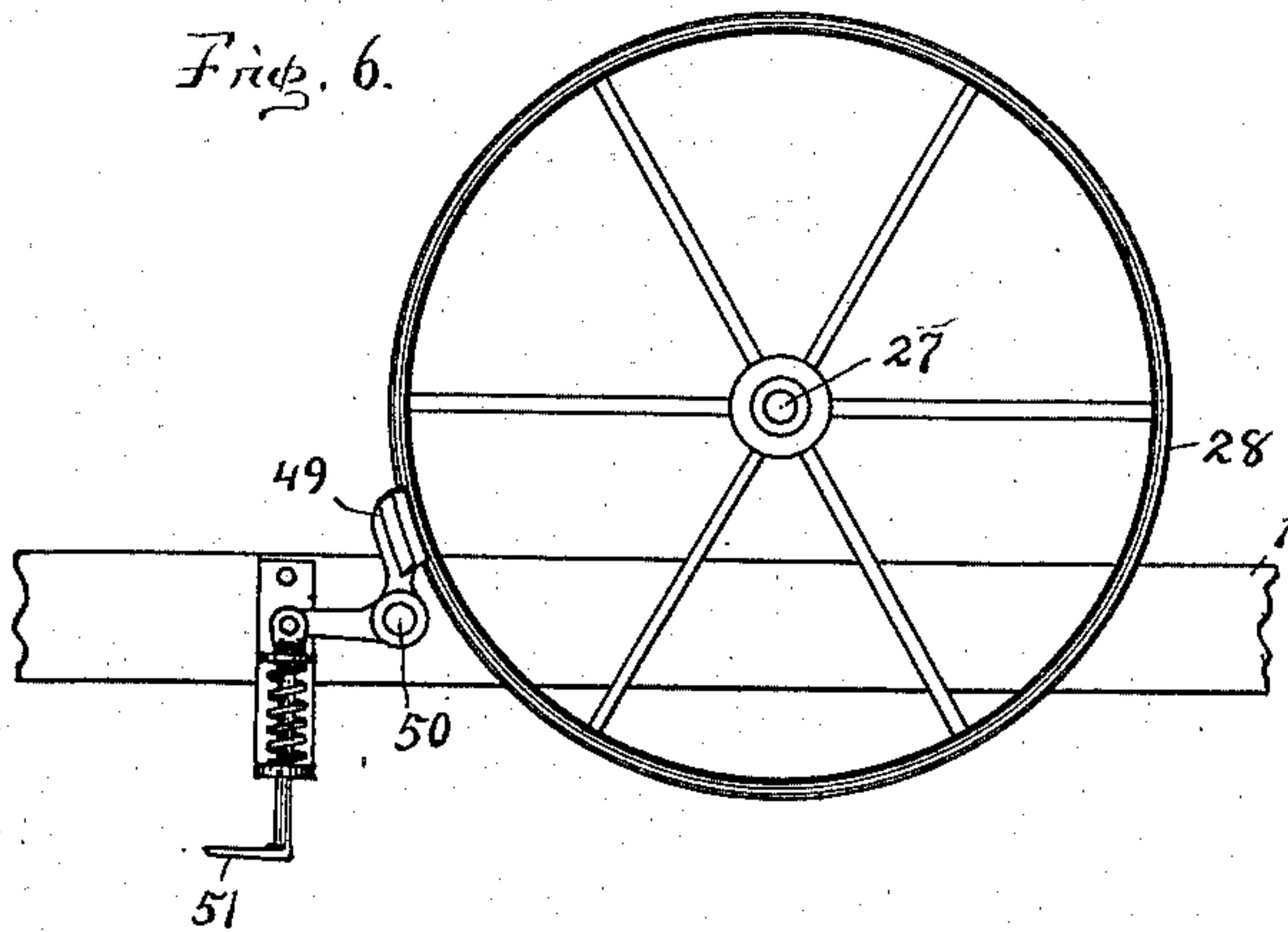


Fig. 7.

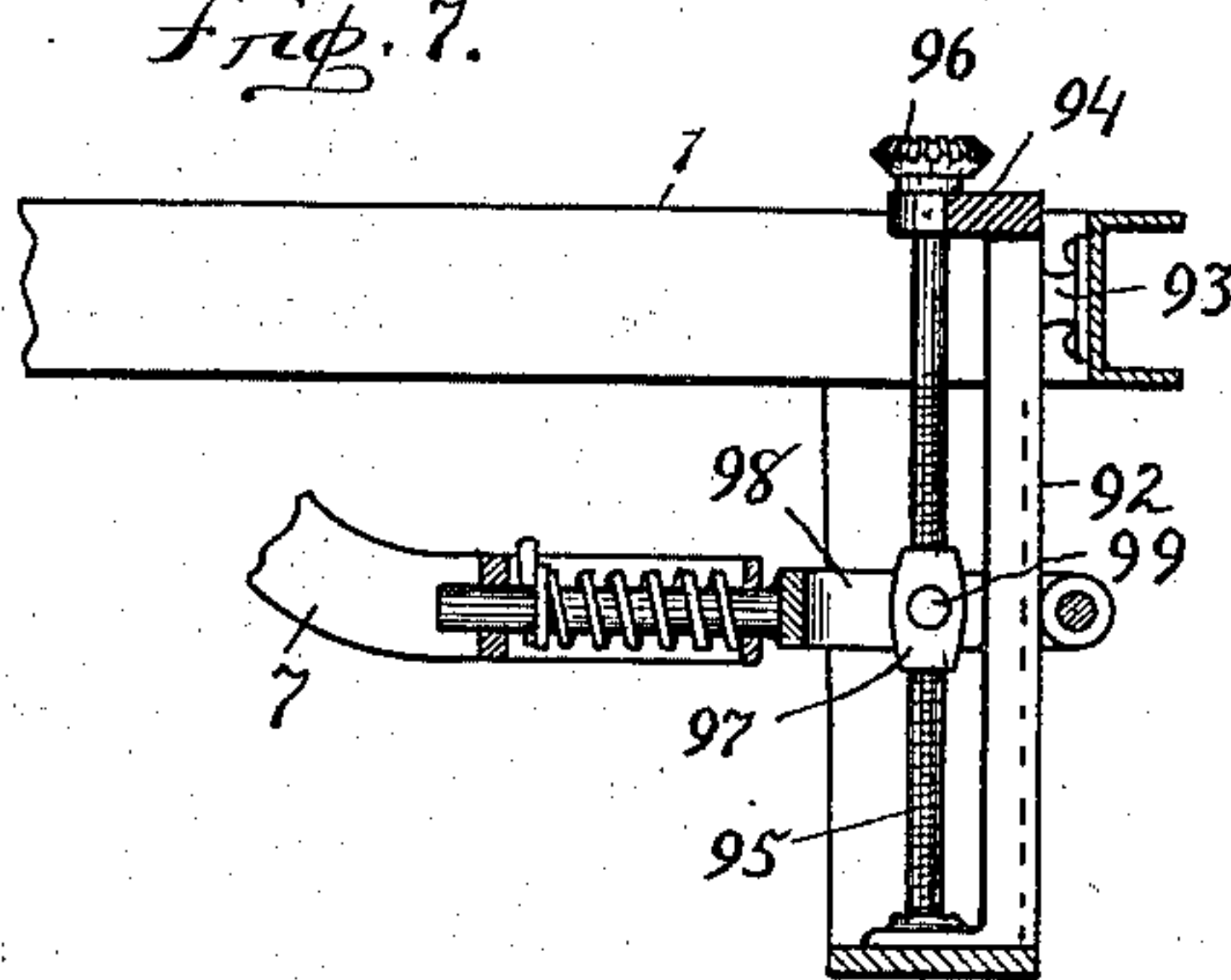
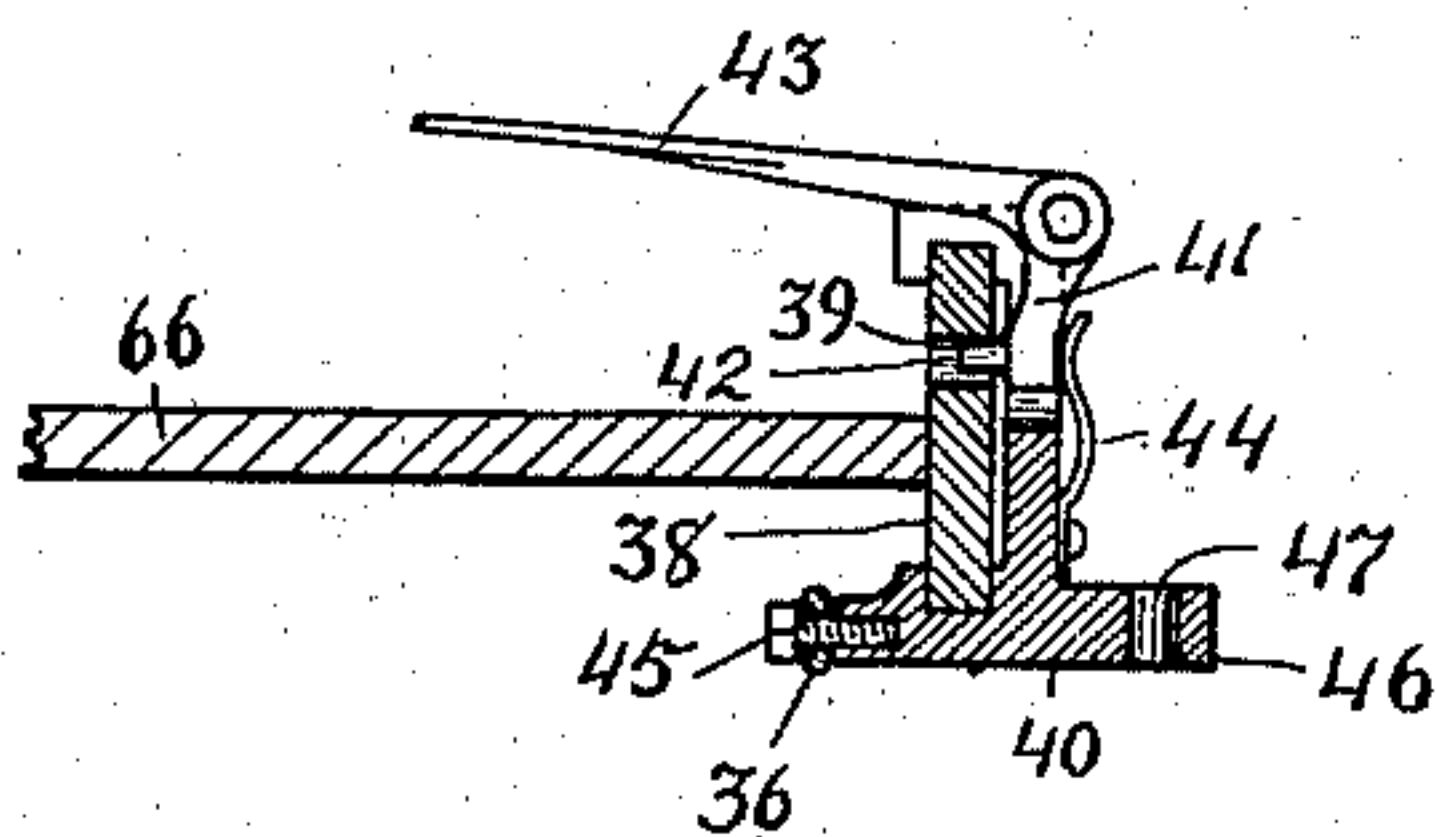


Fig. 8.



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UNITED STATES PATENT OFFICE.

ELIAS L. LATHROP, OF FORT WAYNE, INDIANA.

ROAD-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 749,617, dated January 12, 1904.

Application filed July 6, 1903. Serial No. 164,421. (No model.)

To all whom it may concern:

Be it known that I, ELIAS L. LATHROP, a citizen of the United States, residing at Fort Wayne, in the county of Allen, in the State of Indiana, 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 objects of my present invention are to provide a road-making machine having the following novel features: a rear axle adapted for a longitudinal shift or extension and also permitting a canting or inclination of the rear wheels to resist the side thrust of the scraper-blade, wheels having a detachable inward extension of the perimeter to serve as a roller in use, an improved scraper-blade-reversing ring, an improved means for raising and lowering the front end of the draw-bars to secure an adjustment of the scraper-blade, and means for securing a direct draft upon the front axle instead of upon the draw-bars.

In the accompanying drawings, in which similar reference-numerals indicate like parts throughout the several views, Figure 1 is a view in elevation of my improved machine, showing the relative arrangement of the operative parts. Fig. 2 is a plan view of the same. Fig. 3 is a plan view of the rear axle and carrying-wheels with the axle-box broken away in part and showing the means for imparting to the axle a longitudinal extension. Fig. 4 is a view of one of the rear wheels having its perimeter provided with a lateral extension, taken in vertical central section, and also showing a rear view of the axle-box broken away in part. Fig. 5 is a cross-section of the rear axle, taken on the line *x x* of Fig. 4 and also showing the operator's platform in longitudinal section. Fig. 6 is a side view of one of the hand-wheels for vertically adjusting the rear end of the draw-bars, showing the spring-pressed brake therefor. Fig. 7 is a detail of the vertical screw-shaft for raising and low-

ering the front end of the draw-bars. Fig. 8 is a detail of the lock for the rear end of the draw-bars.

Referring now particularly to Figs. 1 and 2, the channel-iron frame 1 of the machine upon which the operating mechanism is mounted is of common or any proper construction open at its rear end, has its front end pivotally supported upon the front axle 2 by means of a proper standard 3 and a bracket 4 of common form and arrangement. The ground-wheels 11 and 12 are of special construction, as hereinafter described. Near the front end of the frame 1 are arranged a proper driver's seat 5 and footboard 6. To the lower face and near the rear end of the bifurcated draw-bars 7 of common form is rigidly fixed a scraper-blade-supporting ring 8, having a series of peripheral openings 13. A pair of pendent brackets 9 of well-understood construction and arrangement are slidably mounted upon the inner face of the ring 8, are rigidly connected by the diametric blade-supporting bar 14, and have the scraper-blade 10 rigidly fixed to their front face. On this bar 14 is rigidly fixed a second ring 16 in concentric arrangement with the outer ring 8 and has its inner face provided with cogs 8' in the usual manner. To the upper edge of the ring 8 is rigidly fixed the opposite ends of the slightly-arched bar 17, which is arranged out of contact with the inner ring 16. At a point near the rear end of the bar 17 is loosely mounted the vertical hand-wheel shaft 15, carrying upon its upper end a hand-wheel 18 and upon its lower end a fixed cog-wheel in mesh with the cogs 8' for the purpose of rotating the ring 16 to secure any desired horizontal adjustment of the blade 10 in the usual and well-understood manner. Midway of the ends of the bar 17 and in a suitable opening therein is loosely mounted the upright shaft 19, carrying upon its upper end a hand-wheel 20. To the lower end of this shaft 19 and in diametric relation are pivotally connected the inner end of the rods 21, which in turn are pivotally connected to the short rods or pins 22, which pass loosely through suitable openings in the perimeter of the ring 16 and are adapted to engage the peripheral openings 13 in the perimeter of the ring 8

when it is desired to secure the blade in any desired horizontal adjustment. To the opposite sides of the frame 1 and near the rear end thereof are rigidly fixed the upright standards 24, of common form and arrangement, having upon their outer face a pair of lateral lugs in which the vertical rack-bars 25 are loosely mounted. These rack-bars have teeth upon their rear face and are adapted for an actuating engagement with the respective pinions 26, which are fixed upon the outer end of the short horizontal shafts 27, having the hand-wheels 28 fixed upon their inner end. From a lug 29 upon the front face of the rack-bars 25 are loosely suspended the rods 30, having their lower ends loosely secured to the respective rear ends of the draw-bars 7, Figs. 1 and 2. In suitable rearwardly-projecting lugs 31 and 32 upon the extremities of one of the said standards 24 is loosely mounted the shaft 33, carrying upon its upper end a hand-wheel 34 and upon its lower end a sprocket-wheel 35, on which is mounted an endless transverse sprocket-chain 36, which also passes over a second sprocket-wheel or idler 37, loosely mounted in the lower end of the other of said standards 24. Upon the front face and at the lower end of the said standards 24 is rigidly fixed the transverse horizontal bar 38, Figs. 2 and 8, provided with a series of lateral perforations 39, adapted for a holding engagement with the locking device (shown in Fig. 8) and constructed as follows: A block 40, grooved as shown, has a vertical slot in its upper edge, in which is pivotally mounted a catch or pawl 41, having upon its lower end a pin 42, adapted for a holding engagement with the said perforations 39, and having upon its other end a pedal-lever 43 for releasing the said pawl, which is normally held to its engagement by a proper spring 44. This block 40 has upon its rear edge a screw 45, by which the chain 36 is secured thereto, and has upon its forward edge a lug 46, provided with a vertical perforation 47, in which the upper end of the rod 48 is loosely secured, its lower end being loosely connected to either one of the rear ends of the draw-bars 7, Fig. 2, all of which is a well-understood construction.

The hand-wheels 28, by means of which rear end of the draw-bars is raised or lowered through the medium of the vertically-adjustable rack-bars 25 in a well-understood manner, are normally held with great firmness in any desired adjustment by means of the spring-pressed brake-shoe 49, pivoted on the pin 50 and provided with a pedal-lever 51.

My improved shifting and canting rear axle is constructed as follows: In a closed boxing 52, Figs. 3 and 4, having a central longitudinal partition 53, are slidably mounted in the usual manner the axles 54 and 55, identical in construction and having upon their outer face a series of cogs 56 and having their outer end bifurcated, as shown. The rear end of the

spindles 57 of the rear wheels have a fixed vertical bracket 58, apertured at its ends, which are pivotally connected to the bifurcated adjacent ends of the axles by means of the pins, screws, or bolts 59 and 60. The rear wheels are normally secured against any canting movement by means of the pin 61, which is inserted in registering apertures in the bifurcated end of the axle and the brackets 58. The brackets 58 have rearwardly-projecting lugs 62, to the outer ends of which are pivotally connected the rods 63, whose inner ends are slidably mounted in a boxing 64 and are rigidly secured in position therein by means of the set-screws 65. An operator's platform 66, of common form and arrangement, is supported in any suitable manner in and beneath the rear end of the frame 1, preferably having its forward end fixed on the bar 38 and its rear end supported between the upright standards 67, which are erected upon the opposite ends of boxing 52 and support the rear end of the main frame 1 at their upper end. In an opening in the rear end of this platform is loosely mounted the vertical shaft 68, Figs. 3, 4, and 5, having a hand-wheel 69 upon its upper end and having its lower end rotatably mounted in a suitable bearing 70 on the rear face of the axle-box 52 and provided with the bifurcated lug or fixed rearwardly-projecting bracket 71, which is pivotally connected to the boxing 64 by means of the pin 72. The shaft 68 is also provided with a fixed forwardly-projecting toothed sector 73, adapted for a holding engagement with the pawl 74, pivotally mounted on the axle-box and having an operating pedal-rod 75, which passes upward through the platform 66 and is provided upon its upper end with a coiled retractile spring 76, by which the pawl is normally held to its engagement. At the sides of the operator's platform and upon the opposite sides of the axle-box 52 are arranged the vertical hand-wheel shafts 77 and 78, having upon their upper end the hand-wheels 79 and 80, respectively, and having their lower end rotatably mounted in the lateral lugs 81 on the adjacent side of the axle-box and are provided with the fixed pinions 82 and 83, in mesh with its respective extensible axle 54 or 55, and are also provided with a fixed circular rack 23, Fig. 3, normally in mesh with the holding-pawl 84, pivotally mounted on the axle-box and having its forward end pivotally connected with the vertical rod 85, which passes upward through the operator's platform and has upon its upper end a coiled retractile spring adapted to normally hold the pawl 84 to its engagement.

My improved ground or traction wheels adapted to be employed for rolling the freshly-graded road are constructed as follows: The hubs 86, the spokes 87, and the perimeter 88 are all of the usual or other proper construction. To the inner edge of the perimeter 88

is rigidly fixed a second detachable perimeter 89, of like diameter and proper width, which is rigidly secured thereto by means of the lateral lugs 90 and proper bolts 91, Fig. 4. Obviously this detachable perimeter 89 may be made integral, if desired, and supported by spokes in the usual manner.

In my improved scraper-blade-reversing ring the radial openings 23 for the lock 22 are arranged in horizontal relation, Fig. 1, instead of being vertical notches in the base thereof, thereby affording a smooth track for the blade-hangers.

My improved means for revising and lowering the front end of the draw-bars is described as follows: On the bracket 4 is erected an upright post 92, rigidly connected to the main frame 1 by a lug 93, Fig. 7, and having upon its upper end a rearwardly-projecting lug 94, in which is loosely mounted the upper end of the vertical screw 95, carrying the bevel gear-wheel 96, and having its lower end revolubly mounted in a suitable bearing in the base of the post 92. On this screw 95 is arranged an internally-screw-threaded block 97 by a screw-threaded connection. This block is pivotally connected to the opposite sides of the bifurcated head 98 of the draw-bars 7 by the diametrically opposite pins 99. In an upright lug 100 upon the upper end of the post 92 and an upright bracket 101, fixed on the main frame 1, near its front end, is rotatably mounted a short horizontal shaft 102, Fig. 2, carrying upon its inner end a bevel gear-wheel 103, in mesh with the gear 96 on the screw-shaft 95, and carrying upon its outer end a bevel-gear 104, in mesh with the bevel-gear 105, fixed on the forward end of the rearwardly-extended operating-shaft 106, having its forward end rotatably mounted in a lug 107 of the bracket 101 and having its rear end loosely mounted in a suitable bearing in the adjacent standard 24 and carries upon its rear extremity a hand-wheel 108, arranged within convenient reach of the operator on the platform 66.

In my present invention I connect the detachable pivoted tongue 109 to the front axle 2 instead of to the draw-bars, and thereby secure a nearly direct shaft, which is obviously a great advantage over the present method.

The operation and manner of employing my invention thus described is obvious and briefly stated is as follows: Since the tongue 109 is secured directly to the front axle, it is much nearer in a horizontal line with the cutting edge of the scraper-blade, and therefore I secure a more direct draft than usual, with all of its obvious advantages. By placing the perforations for the locking-pins 22 in a radial arrangement in the blade-supporting ring 8 I secure a much more convenient, efficient, and reliable means for locking the scraper-blade in any desired position for use. When the operator, who stands upon the platform 66, desires to secure any desired vertical adjustment of the front end

of the draw-bars 7, he simply rotates the operating-shaft 106, thus actuating the vertical screw-shaft 95 through the medium of the geared shaft 102, and thereby raising or lowering the screw-threaded block 97 thereon, and with it the front end of the draw-bars, to which it is pivotally connected. By this construction of the means for raising and lowering the front end of the draw-bars I am able to mount the long operating-rod entirely to one side of the main frame, and thereby secure two important advantages—viz., the elimination of the cross-bar which supports the rear end of the operating-rod and which is necessarily in the way of the operator when he desires to adjust the scraper-blade. The second advantage is when this rod is at the right-hand side and outside of the main frame the operator can sight and guide the adjacent end of the blade in lining up for ditch or street work, either at the side or middle of the road, and at the same time continuously operate the means for raising and lowering the front end of the draw-bars. When it becomes necessary in use to cut into a bank with one end of the scraper-blade and it is desired to so set the machine as to resist and neutralize the side thrust of the blade, the operator readily cants the rear wheels, as shown in dotted outline in Fig. 3, by removing the pins 61, bearing down with his foot upon the top of the pedal-rod 75, thereby releasing the pawl 74 from its holding engagement with the sector 73, after which he rotates the hand-wheel shaft 68 in the desired direction, thereby canting the rear wheels to any desired angle with their normal position, after which he secures them in such position by releasing the said pedal-lever and permitting the pawl 74 to resume its holding engagement, thereby firmly securing the rear-wheels in such canted position for use.

My improved combined shifting and canting axle thus described has the following advantages over the prior art: By having the axle-box in one piece and open only at the ends the slidable axle-sections are not only inclosed, but afford such a support to the axle-sections as to prevent all tendency to sag under the various strains incident to use. By having the shifting and adjusting mechanism mounted upon the axle-box their simplicity and convenience is greatly increased. When the axle-sections are extended, they are greatly strengthened by the rods 63, which tend to equalize the strain upon the axle-box and axles when some obstruction has been violently struck by one of the rear wheels.

When the operator desires to lengthen the rear axle, the pins 61 being in position, he loosens the set-screws 65, thereby making the rods freely slidable in the box 64, then in turn releases the pawls 84 from their holding engagement with the respective racks 23, after which he rotates the shafts 77 or 78, or both, as required, thereby correspondingly extend-

ing the shifting axles 54 and 55. He then rigidly secures these axles in such adjusted position by permitting the spring-pressed pawls 84 to resume their normal holding engagement and then adjusting the set-screws 65 to their holding position. In a similar manner either rear wheel can be separately extended or retracted at pleasure.

When it is desired to roll the newly-made road, the operator simply adjusts the detachable perimeter 89 upon the inner edge of each of the four ground-wheels, as described, and then so extends the rear axle, as described, as to have the inner edge of the perimeter of the rear wheels in alinement with the outer edge of the perimeter of the front wheels, whereby, assuming the width of each wheel-perimeter to be eight inches, the machine will roll a track thirty-two inches wide at each operation.

Obviously should the peripheral section 89 be made integral instead of detachable all necessary to convert my invention into an efficient road-roller is to properly extend or adjust the rear axle as described.

Having thus described my invention, what I desire to secure by Letters Patent is—

1. In a road-working machine means for raising and lowering of the draw-bars consisting of a vertical screw-shaft rotatably mounted in a suitable support and carrying upon its upper end a bevel gear-wheel; an internally-screw-threaded block mounted on the said screw-shaft and pivotally connected to the front end of the draw-bars; a horizontal shaft having upon one end a bevel-gear in mesh with the bevel-gear on the screw-shaft, and carrying upon its other end a bevel-gear in mesh with a bevel-gear on the operating-shaft; and a rearwardly-extended operating-shaft arranged above and at one side of the main frame for the purpose described, and carrying upon its forward end an actuating bevel-gear.

2. Means for raising and lowering the front end of the draw-bars in a road-machine consisting of an upright rotatable screw-shaft carrying upon its upper end a fixed bevel-gear;

a screw-threaded block operatively mounted on the said shaft; a rearwardly-extended operating-shaft arranged above and at one side of the main frame and carrying upon its forward end an actuating bevel-gear operatively connected with the said screw-shaft by means of an interposed shaft carrying upon its opposite end meshing-gears as described.

3. In a road-machine a combined shifting and angularly-adjustable rear axle consisting of a box open only at its ends; a pair of axle-sections slidably mounted therein and pivotally connected at their outer ends to the spindles; means for actuating the axle-sections longitudinally; means for securing the spindles in alinement with their respective axle-sections consisting of a pair of pins as described; means for rigidly securing the axle-sections in position consisting of a pair of rods whose outer ends are pivotally connected to the respective spindles and whose inner ends are slidably mounted in a proper guide; and means for rigidly locking these rods in position, all substantially as described.

4. In a road-machine a shifting and canting axle consisting of two axle-sections slidably mounted in a closed boxing, and pivotally connected at their outer ends to the spindles; means for actuating the axle-sections consisting of upright hand-shafts whose lower ends are in mesh with the respective axle-sections; a pair of removable pins adapted to rigidly unite the axle-sections and the spindles; means for rigidly securing the axle-sections in any desired adjustment comprising a pair of rods pivotally connected at their outer ends to the spindles; and means for locking their inner ends at will, all substantially as described.

Signed by me at Fort Wayne, Allen county, State of Indiana, this 29th day of June, A. D. 1903.

ELIAS L. LATHROP.

Witnesses:

AUGUSTA VIBERG,
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