

M. J. TODD & D. FARQUHAR.
ROAD ROLLER.

APPLICATION FILED MAR. 30, 1908.

Patented Nov. 9, 1909.

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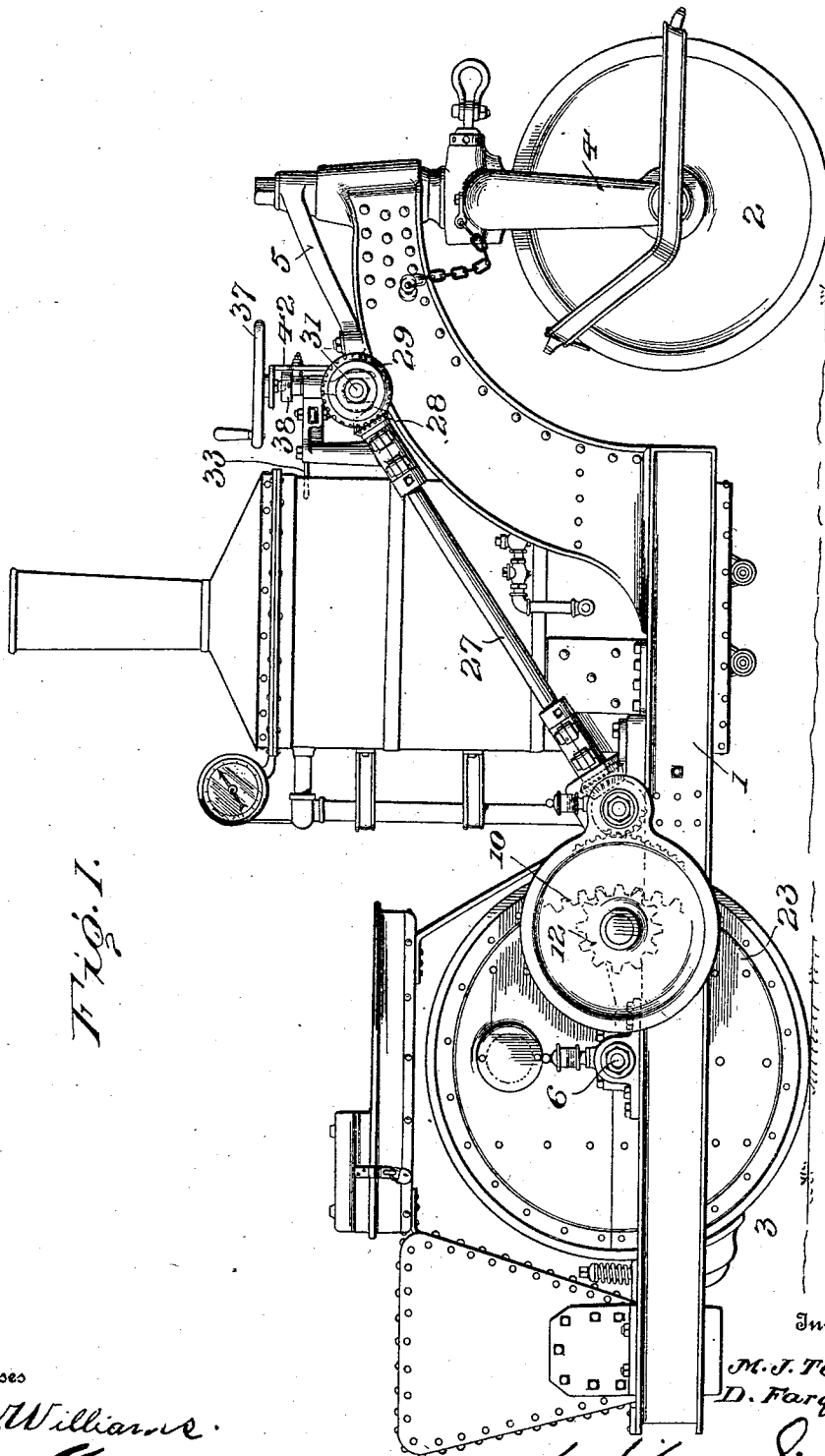


Fig. 1.

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4 SHEETS--SHEET 2.

Fig. 2

Fig. 2a

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4 SHEETS—SHEET 3.

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Fig. 3.

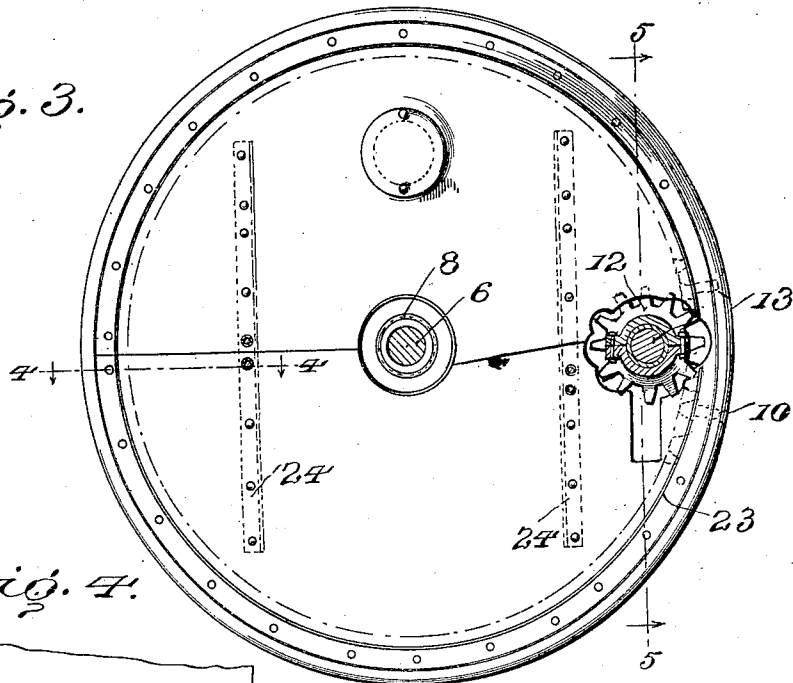


Fig. 4.

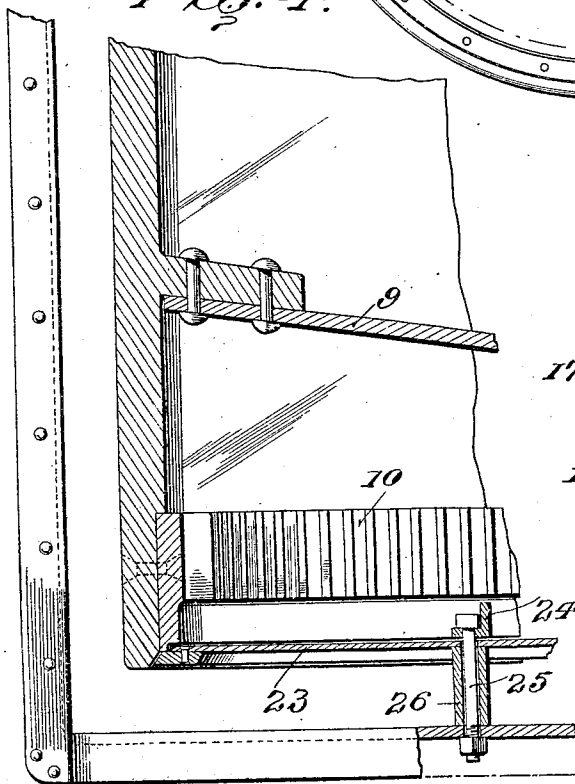
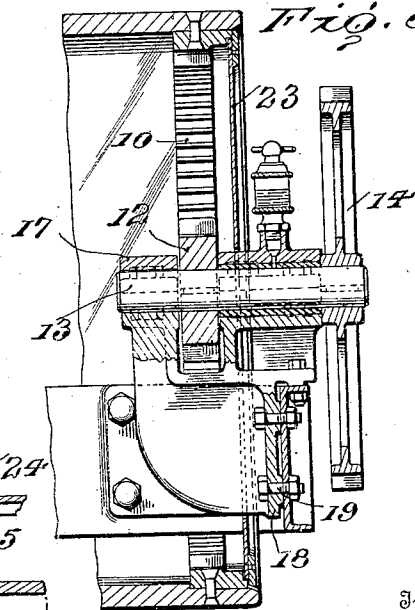


Fig. 5.



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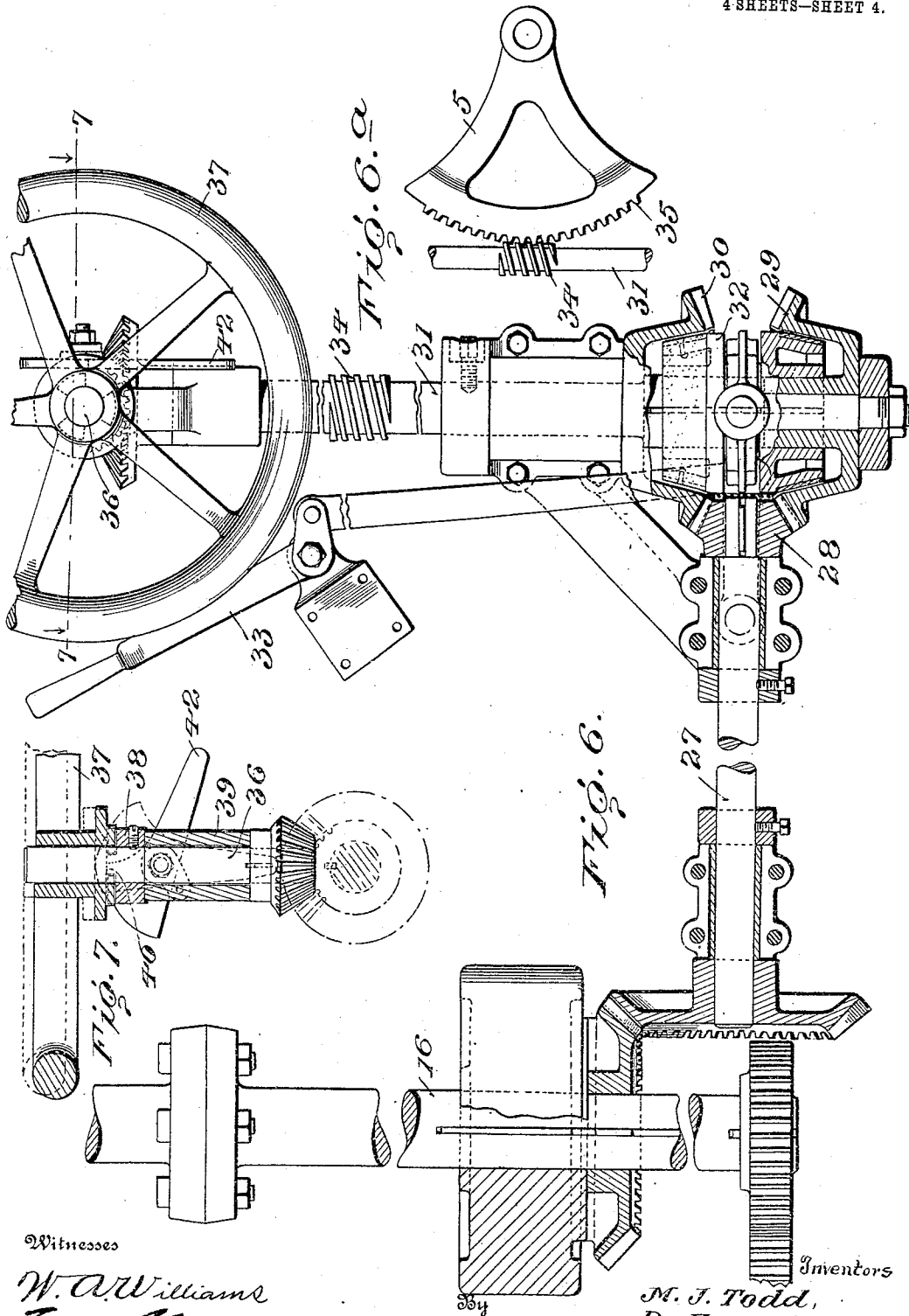
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4 SHEETS—SHEET 4.

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ROAD-ROLLER.

939,877.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, MARQUIS J. TODD and DAVID FARQUHAR, both of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Road-Rollers; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The primary object of this invention is to secure an even application of power to the rear roll of a tandem road-roller so as to avoid all twist and strain upon the spokes thereof, and to prolong the life of the gearing and avoid unequal strain upon the frame of the machine.

A further object is to protect the gearing of the rear roll from dirt, sand and gravel. The invention will be hereinafter fully set forth and particularly pointed out in the drawings.

In the accompanying drawings, Figure 1 is a side elevation, with parts omitted, of a road roller embodying our present improvements. Fig. 2 is an enlarged sectional view taken horizontally through the rear roll. Fig. 2^a is a detail. Fig. 3 is an end view of the rear roll, with a portion of the guard plate broken away. Fig. 4 is an enlarged fragmentary sectional view through a portion of the rear roll and the guard plate. Fig. 5 is an enlarged sectional view of the gearing for driving the rear roll. Fig. 6 is a sectional view of the steering mechanism, with parts broken away. Fig. 6^a is a detail plan view. Fig. 7 is a detail.

Referring to the drawings, 1 designates the main frame whereon are mounted the boiler, the engine, and all necessary parts, but these will be described only so far as is necessary to an understanding of our present improvements. The frame is supported by the front roll 2 and the rear roll 3, arranged in tandem, the front roll having the usual yoke 4 to the pivot shaft of which is secured the steering arm 5. The axle 6 of the rear roll is fixed in bearings 7 supported upon the sides of frame 1, and the roll itself has at its axis a tubular sleeve 8 which fits upon the axle. The shell of the roll is connected by spokes 9 to this sleeve, preferably by rivets passed through flanges

of the roll and flanges of the sleeve. These flanges, and hence the spokes, are set in some distance from the ends of the drum so as to permit the roll to be driven by internal gearing at each end thereof without interference from the spokes. To the inner face of the roll, at each end, is secured a continuous rack 10, and with each rack meshes a pinion 12 fast on a short stub-shaft 13 carrying at its outer end a gear wheel 14 which in turn is in mesh with a pinion 15 on the engine crank-shaft 16. The bearings 17 for the stub-shafts 13 are supported by the side bars of frame 1 and by cheek plates 18 bolted to the sides of frame 1 by bolts 19. The bearings extend into the roll, intersecting the planes of racks 10, and each bearing is cut away to form a space to accommodate one of the pinions 12. The forward ends of the cheek plates 18 extend inwardly a short distance, transversely of the frame and immediately forward of the rear roll, and to these inwardly bent ends is secured a brace plate 20 which connects the two sides of the frame. The plates 18 extend along the sides of frame 1 as far rearwardly as the bearings 7 so as to furnish additional supports for the latter. By this means the roll-driving mechanism is supported in such manner as to prevent deflection of either of the stub-shafts 13 by torsional strain. The bearings 21 for the engine driven crank-shaft 16 are also supported by the side bars of the main frame, and in order to provide for uniformity in the engagements between the two driving pinions 12 with the respective racks 10 this crank-shaft is formed in two sections coupled together by bolts passed through flanges at the meeting ends, the openings in one flange being in the form of slots so as to permit of a relative adjustment axially between the two sections, and thereby insure accurate alignment and uniformity in the operation of the gearing at the two ends of the roll.

As shown in Figs. 2 and 4 the outer edges of the roll and the outer edges of the rack bars 10 are, respectively, beveled and recessed, to accommodate the correspondingly formed edge of a circular shield 23 which forms a covering to prevent dirt, sand or gravel from entering the roll and gearing. Each shield is preferably composed of two plates secured together by angle irons 24

extending vertically thereof. Through these angle irons are passed bolts 25 by which the shields are secured to the sides of the main frame. As shown in Fig. 4, spacing thimbles 26 encircling these bolts are located between the shield and the sides of the main frame. Each shield is, of course, formed with an opening to accommodate that portion of the adjacent bearing 17 which projects therethrough.

From what has been so far stated it will be seen that the driving power of the rear roll is applied equally to both ends thereof, instead of to only one end as has heretofore been customary, the result being that the spokes of the roll as well as the gearing are relieved of the twisting strain which is necessarily involved when power is applied at only one end; and likewise by thus driving the roll twisting strain upon the frame of the machine is avoided. Furthermore, by locating the driving mechanism on the inner face of and within the roll we are enabled by the use of shields to protect the same from mud, dirt and the like, and to relieve the spokes of the driving strain, the power being applied directly to the shell of the roll.

27 designates a shaft located at one side of the machine and extending from the engine crank shaft, by which it is constantly driven, to a point near the upper forward end of the frame. This shaft has a small beveled pinion 28 which is constantly in mesh with two beveled pinions 29 and 30 loose on a countershaft 31 extending transversely of the frame. Keyed on this countershaft 31 is a longitudinally slidable coupling sleeve 32, which, by the manipulation of a hand lever 33, may be thrown into frictional engagement with either of the beveled pinions 29, 30, according to the direction in which it is desired to rotate the countershaft. This latter shaft carries a worm 34 which is constantly in mesh with a segmental rack 35 on the elongated end of the steering arm 5. Hence the rotation of the countershaft 31 in either direction will effect the shifting of steering arm 5, and in consequence the turning of yoke 4 of the front roll 2. It is essential, however, in machines of this character that provision be made for manually manipulating the steering arm. For this purpose a vertically-disposed shaft 36 is in gear with the far end of the countershaft. It is important, however, that the hand-wheel 37 for turning this shaft 36, should remain idle when the countershaft is being actuated by the engine-driven shaft 27, since otherwise the operator is liable to be injured by the turning of the hand wheel. For this purpose the hand wheel 37 is loose on shaft 36 but will be locked thereto when lowered into engagement with a collar 38 fast on the shaft immediately above the

shaft-bearing 39, said collar having lugs 40 for taking in recesses in the underside of the wheel hub. By turning a hand-lever 42 fulcrumed on a stud projecting from bearing 39, the cam end of such lever upon engaging the lower face of the wheel-hub will elevate the wheel out of engagement with the fixed collar 38. Hence, when the machine is steered by the engine power, the hand wheel will remain idle, and when it is desired to manually steer the machine, the operator turns lever 42 to allow the hand-wheel to interlock with shaft 36.

We claim as our invention:

1. In a road roller, in combination, a main frame, a roll mounted on said frame, continuous racks within the roll at the opposite ends thereof, two sets of gearing at opposite sides of the frame extending into the roll and in mesh with said racks, fixedly mounted shields fitted within the ends of said roll adjacent to said racks, said gearing comprising short shafts, brackets forming bearings for said short shafts mounted on said frame and extending into the roll, beyond the planes of said racks, pinions on said shafts in mesh with said racks, said brackets supporting said shafts on opposite sides of said pinions, and gear wheels on the outer ends of said short shafts, said shields having openings to accommodate said brackets, and an engine driven shaft mounted on said main frame adjacent to said roll and having pinions in mesh with the gear wheels of said short shafts.

2. In a road-roller, a frame, a roll mounted on said frame having a continuous rack at each end thereof, two sets of gearing at opposite sides of the frame meshing with said racks, and an engine-driven crank-shaft for actuating both sets of gearing, said crank-shaft being formed in sections, one of which may be adjusted axially relatively to the other.

3. In a road roller, a frame, a roll mounted on said frame and beveled at its ends, continuous racks within the ends of said roll, two sets of gearing at opposite sides of the frame in mesh with said racks, brackets forming bearings for said gearing mounted on said frame and extending into the roll, an engine driven shaft for actuating both sets of gearing, said shaft being mounted on said frame adjacent to said roll, and fixedly mounted shields having beveled edges conforming to the bevels of the roll, said shields also having openings to accommodate said brackets.

4. In a road-roller, a frame, a roll mounted thereon, continuous racks within opposite ends of the roll, two short shafts extending into the ends of the roll, bearings for said shafts, gearing carried by said shafts, cheek plates secured to the sides of said frame and having angled ends extending inwardly for-

ward of the roll, said bearings being supported by said frame and cheek plates, a brace plate extending transversely of the frame and secured to the angled ends of said shaft mounted on said frame for driving cheek-plates, and an engine-driven crank-said gearing.

In testimony whereof, we have signed this

specification in the presence of two subscribing witnesses.

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