L. F. CHRESTENSON.

DUMP WAGON.

APPLICATION FILED AUG. 21, 1912.

1,068,737.

Patented July 29, 1913.

3 SHEETS—SHEET 1.

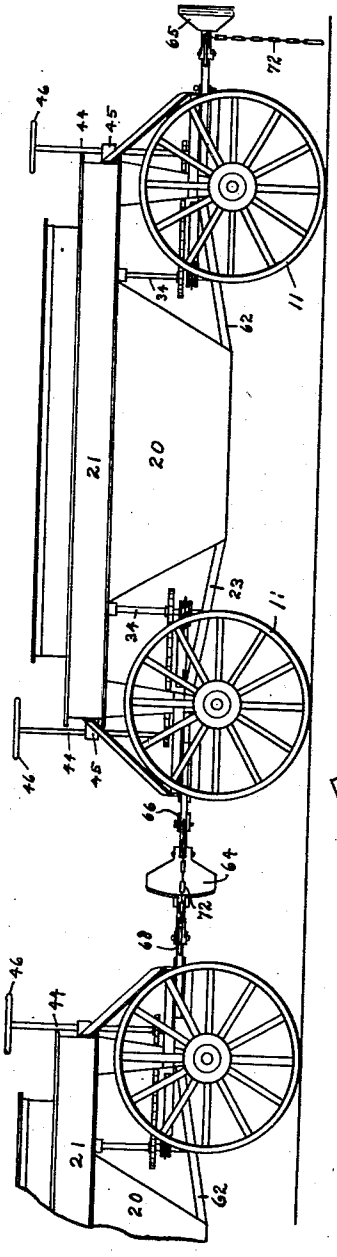


Fig. 1.

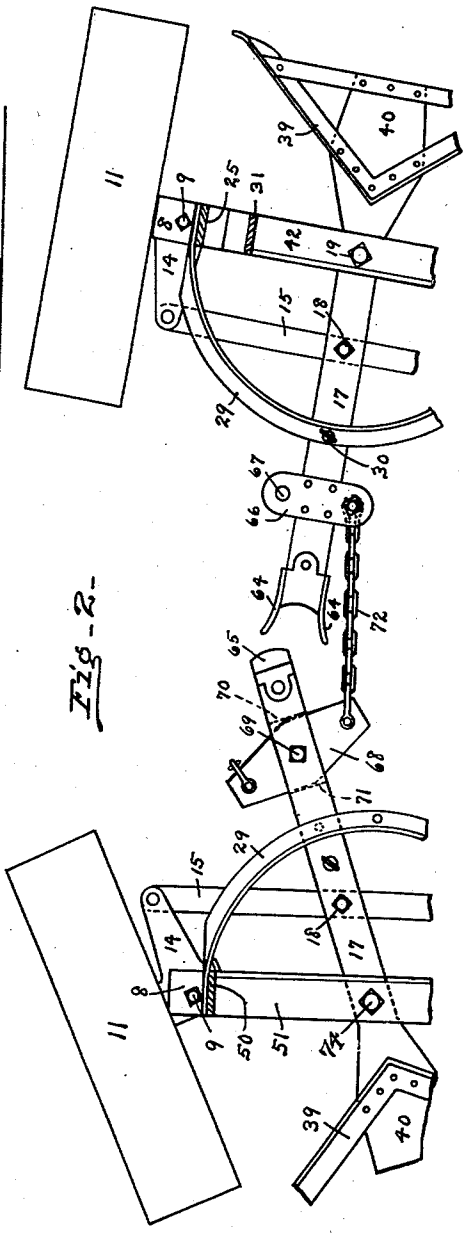


Fig. 2.

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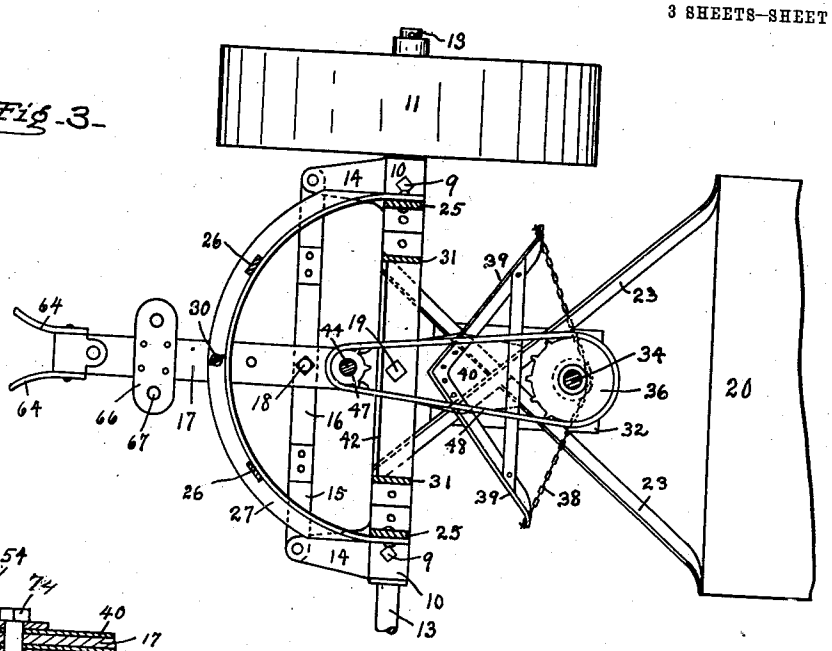
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3 SHEETS—SHEET 2.

Fig. 3.



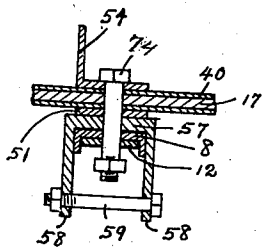
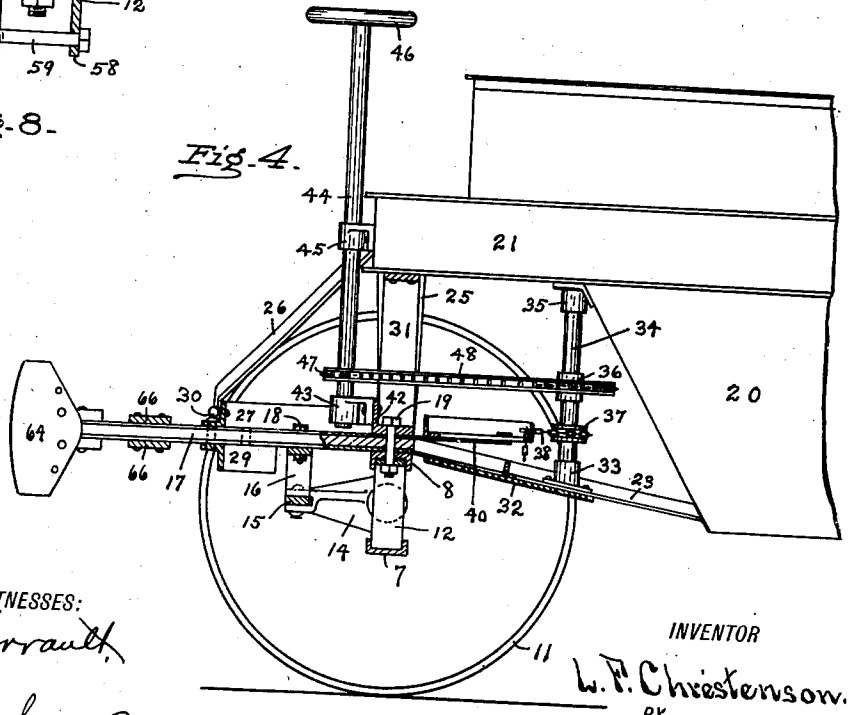




Fig. 8.

Fig. 4.




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3 SHEETS—SHEET 3.

Fig. 5.

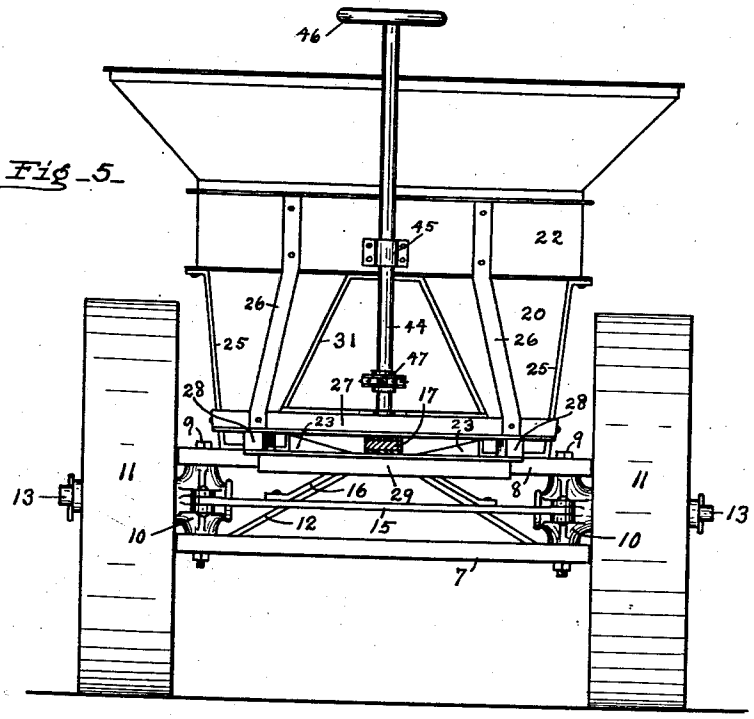



Fig. 6.

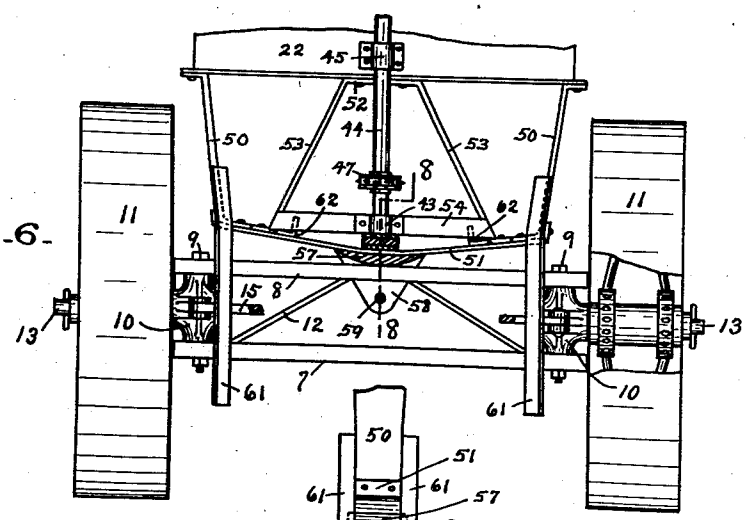
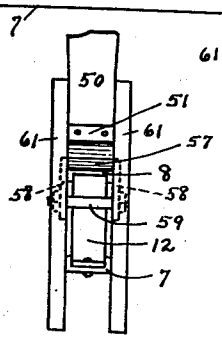



Fig. 7.




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# UNITED STATES PATENT OFFICE.

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## DUMP-WAGON.

1,068,737. Specification of Letters Patent. Patented July 29, 1913.

Application filed August 21, 1912. Serial No. 716,115.

*To all whom it may concern:*

Be it known that I, LOUIS F. CHRESTENSON, a citizen of the United States, and a resident of Port Huron, in the county of St. Clair and State of Michigan, have invented a new and Improved Dump-Wagon, of which the following is a specification.

This invention relates to the construction of heavy wagons used by contractors for carrying away earth from excavations, and its object is to construct a wagon that can be drawn either forward or backward, and which can be pushed forward ahead of a traction engine or other motor and independently steered.

A further object of this invention is to construct the running gear of a heavy wagon in such a manner that it will properly follow the track of another wagon drawing it.

In the accompanying drawings Figure 1 is a side elevation of two wagons coupled together. Fig. 2 is a plan of the running gear of the adjacent ends of two wagons. Fig. 3 is a plan of the steering mechanism for one end of the wagon. Fig. 4 is a central vertical section of the same. Fig. 5 is a rear elevation of a wagon constructed according to my invention. Fig. 6 is a front elevation of this wagon, a portion of the draw-bar and guides being omitted. Fig. 7 is an end elevation of a front axle with the knuckle removed. Fig. 8 is a central section of the axle of Fig. 6, on the line 8—8.

Similar reference characters refer to like parts throughout the several views.

It often occurs that excavations are to be made alongside of blind alleys and in other localities where the dirt wagons have to be pushed in and pulled out over the same road, and where the traction engine or other motor cannot possibly be attached to both ends of the dirt-wagons. Where a number of such wagons are coupled together and are pushed ahead of a motor, the steering of the wagons becomes a very serious question. The construction shown in the drawings is especially adapted for the steering of the first wagon of a row which is being pushed along; and is especially adapted for the following wagons of a line for the reason that it insures the wheels of all the wagons running in the same tracks when drawn by a tractor.

The construction of the body of the wagon forms no portion of this invention and therefore the details are merely shown conventionally.

The axles of this wagon are double and are formed of channel bars 7 and 8 which may have their flanges extending toward each other, which channel bars carry pivot screws 9 for the knuckles 10 of the stub-shafts 13 upon which the wheels 11 are revolubly mounted. Connecting these two channel bars are inclined bracing bars 12. Attached to the knuckles 10 are forwardly extending arms 14 connected by a bar 15. Extending upwardly from the connecting bars 15 are bent or arched members 16 to which the draw bars 17 connect by means of bolts 18. Extending upwardly from the upper channel bar 8 of the rear axle is a bolt on which the rear draw-bar is pivoted.

The car has a body 20 and preferably has side-bars 21 and end bars 22. Inclined angle bars 23 (Figs. 3 and 4) extend from the rear lower corners of the body 20, and after crossing each other, rest on and are secured to the upper axle bar 8 of the rear axle. Extending down from the rear corners of the body frame are braces 25, which connect to and are supported by the upper bar 8 of the rear axle, as shown in Fig. 5. Extending from the rear end bar 22 of the frame are braces 26 which connect to the outer surface of a curved upper guide 27 for the rear draw-bar 17. The ends of this curved guide 27 connect to the braces 25 as shown in Figs. 3 and 5. Mounted on the lower face of the curved guide 27 are two spacing blocks 28, against which is secured the lower guide-bar 29. The guide-bars 27 and 29 are preferably formed of angle bars as shown in Fig. 4. The rear draw-bar 17 is pivoted on the bolt 19, as stated above, and swings freely between the guides 27 and 29 except when locked by the pin 30 which extends through the horizontal flanges of the two guide-bars and through a hole in the draw-bar, as indicated in Fig. 4. The front draw bar is similarly pivoted and supported. Auxiliary braces 31 between the end bar 22 and the axle bar 8 may be employed if desired.

To the lower sides of the diagonal members 23, of the rear end, as shown in Figs. 3 and 4, is attached a plate 32 which supports the bearing 33 of the shaft 34. A second bearing 35 for this shaft is secured to the body of the wagon. On this shaft are se-

cured the sprocket-wheels 36 and 37. A chain 38 extends around the wheel 37 and connects to a frame formed by the two angle-bars 39 and the plate 40, which plate extends to and forms a part of the draw-head 17, as shown in Fig. 4. The depth of the diagonal members 23 is slightly greater than that of the draw-bar 17, so that an angle-bar 42, resting on the ends of the diagonal members 23 and spaced by them from the axle 8, will permit the draw-bar to swing between it and the axle. This cross-bar 42 supports a bearing 43 for the shaft 44, which shaft is also journaled in the bearing 45 on the rear plate 22, and carries a steering wheel 46 on its upper end, and a sprocket wheel 47, which engages a sprocket-chain 48 that passes around the sprocket-wheel 36 on the shaft 34.

When the tractor is connected to the outer end of the rear draw-bar 17 the pin 30 will be withdrawn and the draw-bar will pull the vehicle through its connections with the pin 19 and the axle. As the distance between the bolts 18 and 19 is the same as the effective length of the arms 14, the wheels will always be parallel to the draw-bar and swing with it. The upright braces 25, 26 and 31 will keep the axle and the frame of the wagon properly positioned relative to each other and will keep the supporting guides 27 and 29 of the draw-bar parallel to the general plane of the vehicle. When the vehicle is being pushed directly, the rear draw-bar will be locked by means of its pin 30, and the vehicle will be steered by means of the front hand-wheel 46 which will properly turn the front shaft 34 and swing the front draw-bar and with it the wheels 11, as may be desired. By forming the sprocket wheel 47 smaller than the wheel 36, and by making that gear in turn larger than the gear 37, it is possible to steer a very heavily loaded wagon with comparatively little effort. The up and down stresses on the outer end of the draw-bar 17 are not very great, so that the braces 26 and the guides 27 and 29 can be made comparatively light.

Wagons of this kind are very often required to travel over rough roads and it is therefore desirable that the axles be permitted to tilt with reference to each other. It is merely necessary, however, to so construct the bolster of one axle, preferably the front axle, that the body may rock, as the body can remain rigid with respect to the other axle. Referring now to Fig. 6, it will be observed that the bars 7 and 8 are the same as before described, as are also the connecting bar 15 and the knuckles 10; in fact, with the exceptions noted below, the construction at the front end of the wagon is the same as the rear.

Extending down from the front corners of the frame are the braces 50 which connect to the bolster formed of the bars 51 and 54. Another bar connects to the middle part of the frame at 52 and constitutes downwardly extending braces 53, which also connect to the bolster. The second member 54 extends between the lower ends of the braces 53 and supports the bearing 43 for the lower end of the front shaft 44, which has a bearing 45 secured to the frame and a sprocket-wheel 47 for the chain 38. The bolster rests on a saddle, preferably a steel casting, shown in cross section in Figs. 6 and 8, and comprising a transverse portion 57 and downwardly extending plates 58 which are connected across and braced by a bolt 59.

As will be seen in Fig. 6, the portion 57 is rounded so that the bolster, formed by the cross-bars 54 and 51 and by the saddle, may rock freely on the upper member 8 of the axle. Connected to the outer ends of the bolster and the lower ends of the braces 50, on each side of the front axle, as shown in Fig. 7, are bars 61, which, together with the plates 58 of the saddle, hold the axle 7—8 in proper position and form a sufficient connection between them and the body of the wagon. The front draw-bar 17 is pivoted to the bolster cross-bar 51 and saddle 57 by means of a king-bolt 74, as shown in Fig. 8. Instead of the diagonal braces 23, which connect the wagon body to the axle, the braces 62 connect to the bolster-bar 51. This permits the front axle and wheels to rock freely, the holes for the king-bolt 74 being made sufficiently large to permit the bolster and draw-bar to rock laterally. It will therefore be apparent that the pull of the draw-bars will not be on the axles, but will be transmitted from the front draw-bar and king-bolt 74 to the bolster-bar 51 and thence by the diagonal braces 62 to the body. From the body, the pull is transmitted by the braces 23 to the top bar 8 of the axle and by the pin 19 to the rear draw-bar.

Referring now to Figs. 1 to 4 inclusive, it will be noticed that the rear draw-bar is formed with upright plates 64 which bend outwardly, and that the other bar is formed with a head 65 which extends between the plates 64. These devices are of value when one wagon pushes another. Rigidly secured to the rear draw-bar, are cross-plates 66 provided with holes 67 at their ends. The front draw-bar is formed with a horizontal transverse slot in which the cross-plate 68 is mounted on the pin 69. This pivoted cross-plate is limited in its movements by the internal shoulders 70 and 71, shown in dotted lines in Fig. 2. The ends of the cross-plate 68 are also formed with holes so as to receive proper connectors on the ends of the chains 72.

When wagons of this type are drawn over ordinary straight roads, the succeeding wagons will be connected together by two

chains 72 extending from the two ends of one cross-bar 68 to the two ends of the cross bar 66 of the next wagon, the rear draw-bars of all the wagons being secured centrally by their pins 30. When a string of wagons is to go around a corner, the chains 72 on the outer side of the curve will be disconnected, and the movable cross-bar 68 will be swung to the position shown in Fig. 2. The two cross-bars 68 and 66 of adjacent vehicles will then be connected by the inner chain 72 as shown in Fig. 2. The result will be that the front wheels of each following wagon will be swung outward sufficiently to cause the hind wheels to follow the track of the hind wheels of the next preceding wagon.

The details of construction of this wagon can be modified by those skilled in the art without departing from the spirit of my invention as expressed in the claims.

I claim:

1. In a steering device for wagons, the combination of a body, front and rear axles, knuckles mounted in the ends of the axles and having stub-shafts, wheels mounted on said stub-shafts, means to swing said knuckles comprising arms connected to the knuckles and a connecting bar between them, a draw-bar pivoted to an axle and to a connecting bar, a frame connected to the rear end of said draw-bar, a sprocket-chain connecting to said frame, a vertical shaft pivotally mounted on said wagon body, a pair of sprocket-wheels secured to said shaft, one of said sprocket-wheels engaging said chain, a second shaft mounted on said wagon, a steering wheel at the upper end of said shaft and a sprocket-wheel connecting to the same near its lower end, and a chain extending around said sprocket-wheel and a wheel on the first named shaft.

2. In a steering device for wagons, the combination of front and rear axles and the body of the wagon, a draw-bar pivoted intermediate its ends on one of the axles, a steering knuckle in each end of said axle, and a wheel revoluble on each knuckle, a connecting link between the knuckles of the axle, said draw-bar pivoted to said connecting link, a vertical shaft mounted on the body of said wagon, a steering wheel at the upper end of said shaft, and means connecting the shaft to the rear end of the adjacent draw-bar whereby the wagon may be steered.

3. In a wagon, the combination of front and rear axles and a body, a steering knuckle on each end of each axle, and a wheel revoluble on each knuckle, a connecting link between the knuckles of each axle, a draw-bar pivoted to each connecting link and connected intermediate its ends to the adjacent axle, a vertical shaft mounted on each end of said wagon, a steering wheel at the upper end of each shaft, means connecting each shaft to the rear end of the adjacent draw-bar whereby the wagon may be steered, and means for locking said draw-heads in central position.

4. In a wagon, the combination of front and rear axles, steering knuckles mounted on the ends of the axles and wheels mounted on said knuckles, draw-bars extending from said axles, means to lock the same in central position, a horizontal plate centrally pivoted on one of said draw-bars, a chain connected to each end of said plate adapted to connect to the ends of a rigid cross-plate on the draw-head of another wagon.

5. In a wagon, the combination of the body and front and rear axles including knuckles, wheels mounted on said knuckles, a draw-bar pivotally connected to one of the axles, a pair of segmental guide-bars mounted on said axle, one on each side of said draw-bar, braces extending down from said body to said guide bars, a shaft mounted on said body, a steering wheel at the upper end of the shaft, a sprocket wheel secured on said shaft near its lower end, a second shaft mounted on said body, a sprocket wheel on the same, a sprocket chain connecting said wheels, a second sprocket wheel on the second shaft, and means connecting to said second sprocket wheel and to said draw-bar whereby the draw-bar may be swung by the steering wheel.

6. In a wagon, the combination of front and rear axles and the body of the wagon, a draw-bar for each end of the wagon, a knuckle at each end of each axle, a wheel mounted on each knuckle, a connecting link between the knuckles of each axle, means to connect said link to the adjacent draw-bar, a vertical shaft mounted on each end of said wagon, a steering wheel at the upper end of each shaft, a plate extending beyond the pivot of each draw-bar, and means connecting each shaft to the plate on the adjacent draw-bar whereby the wagon may be steered from either end.

7. In a wagon, the combination of a body, front and rear axles, knuckles mounted at the ends of the axles, stub-shafts on the knuckles, wheels mounted on the stud-shafts, arms and links connecting the knuckles, a draw-bar pivoted to the rear axle, guides for the rear draw-bar connected to the rear axle, a front draw-bar, a frame mounted on the body and supporting said front draw-bar and the front axle independent of each other, and guides for the front draw-bar mounted on the frame independent of the front axle.

8. In a wagon, the combination of a body, a rear axle and the connections between the axle and the body, a front axle at the opposite end of the body, a pivotal connection between said front axle and body, a

front draw-bar, draft connections between the draw-bar and body by which the pull of the draw-bar may be transmitted to the body independent of the front axle, and manually operable steering means mounted on the body for swinging said front draw-bar.

9. In a wagon, the combination of the front and rear axles and the body, a draw-bar for one end of the wagon, a pivot for the same, a frame mounted on the wagon to support the pivot for the draw-bar and the adjacent axle, diverging arms mounted on the draw-bar between the pivot and wagon body, a chain extending between the arms, a shaft mounted on the body and a chain wheel on the shaft engaging the chain, and means to turn the shaft to swing the draw-bar and steer the wagon.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

LOUIS F. CHRESTENSON.

Witnesses:
WALTER NORRIS,
G. F. CONNER.