

1,237,494

C. D. ELLWOOD.  
TRACTOR.  
APPLICATION FILED AUG. 25, 1915.

Patented Aug. 21, 1917.

4 SHEETS—SHEET 1.

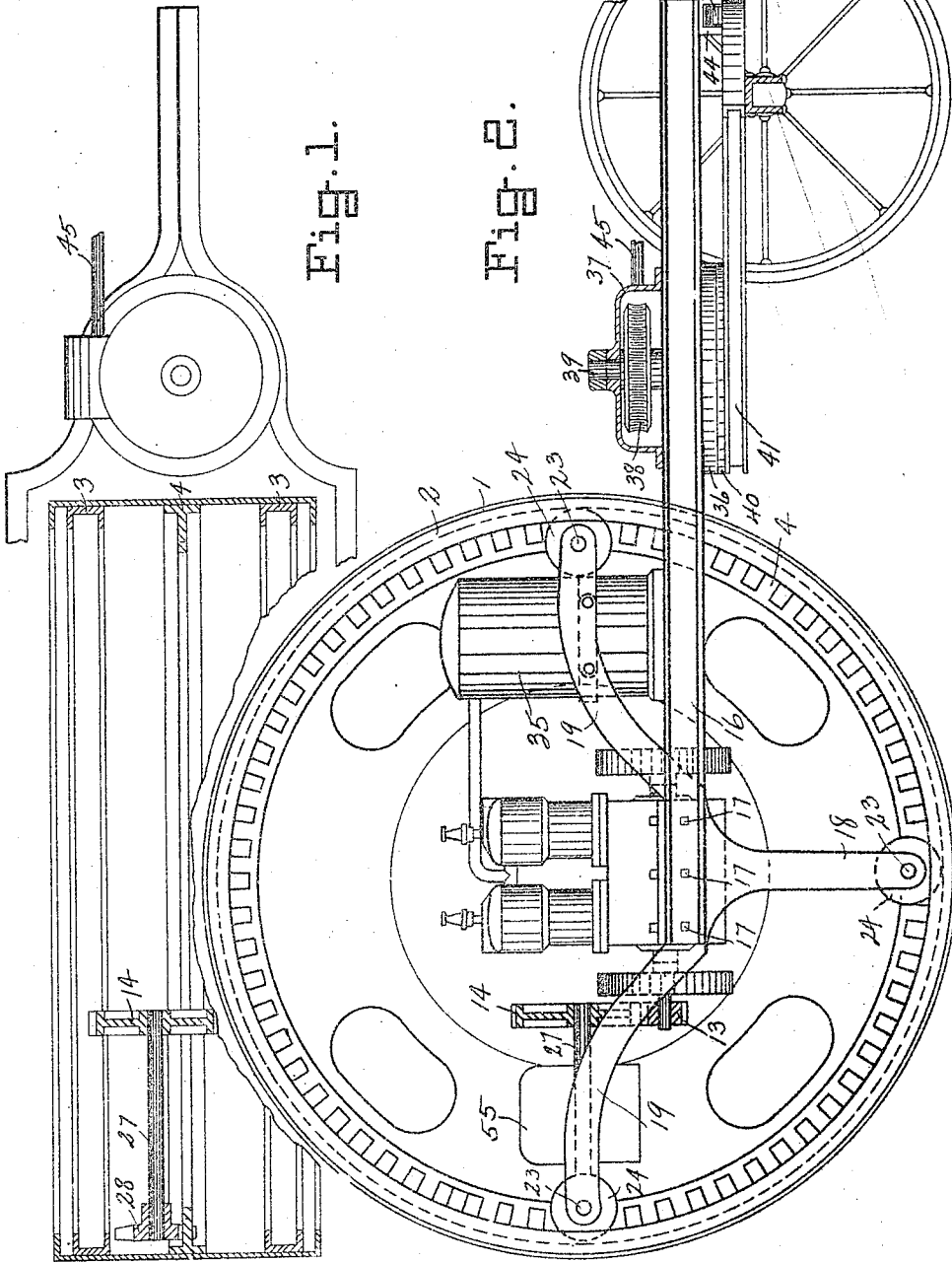


Fig. 1.

Fig. 2.

WITNESSES.

*William W French*  
*Harry Cosley*

INVENTOR

CHARLES D. ELLWOOD

BY *Charles Albert French*  
HIS ATTORNEY

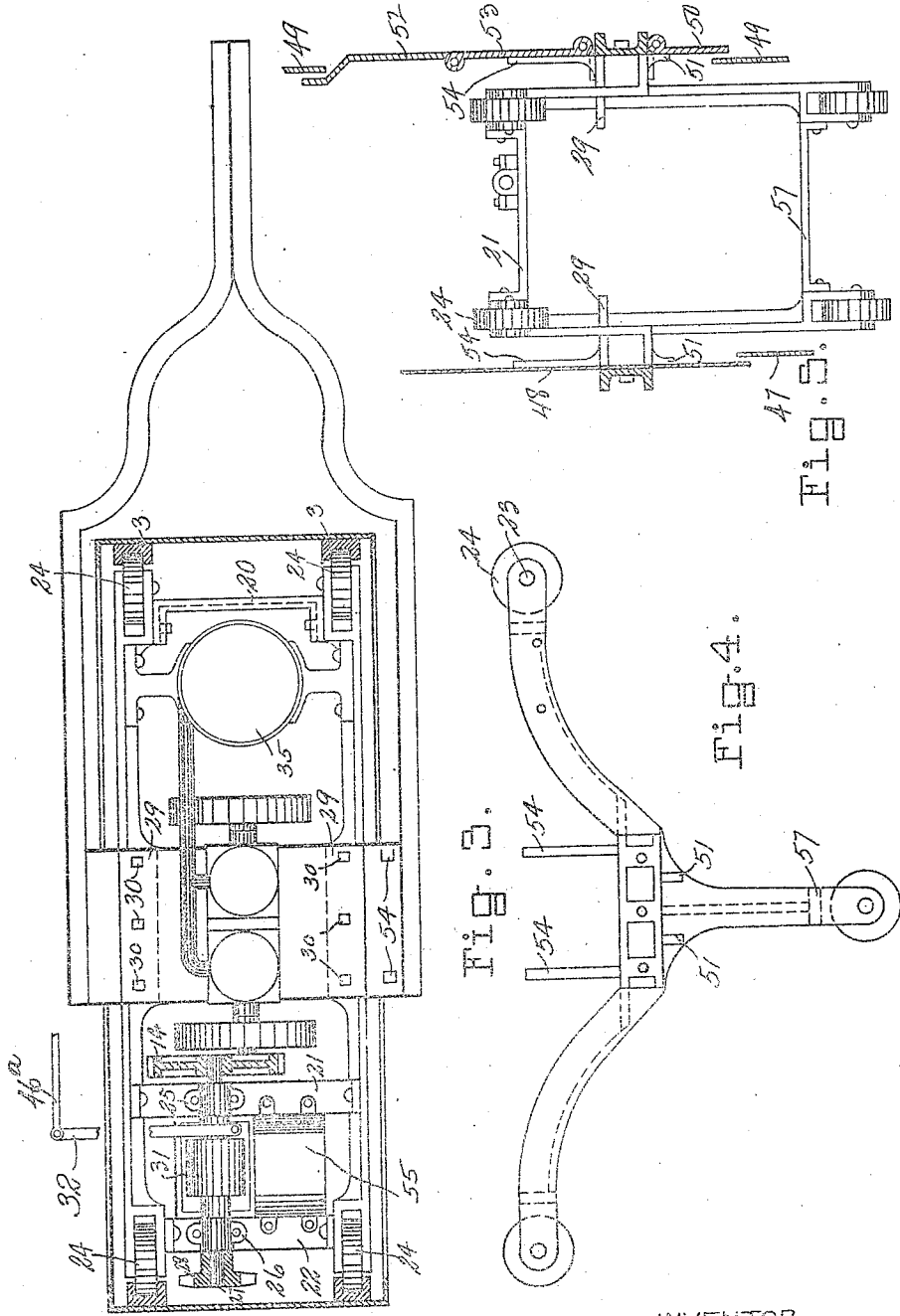
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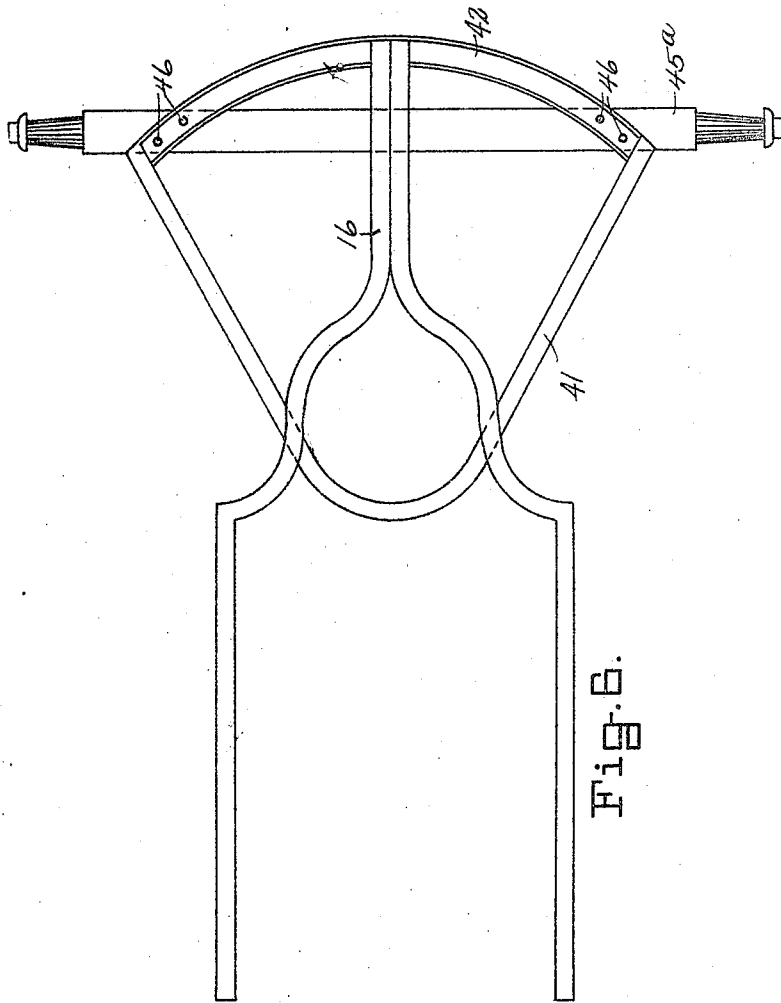


Fig. 6.

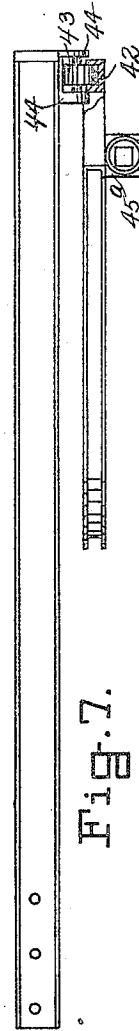


Fig. 7.

WITNESSES

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4 SHEETS—SHEET 4.

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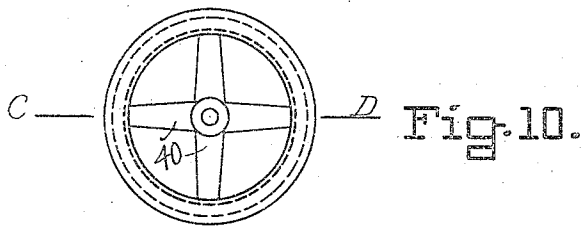


Fig. 10.

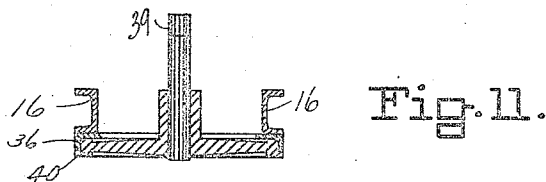


Fig. 11.

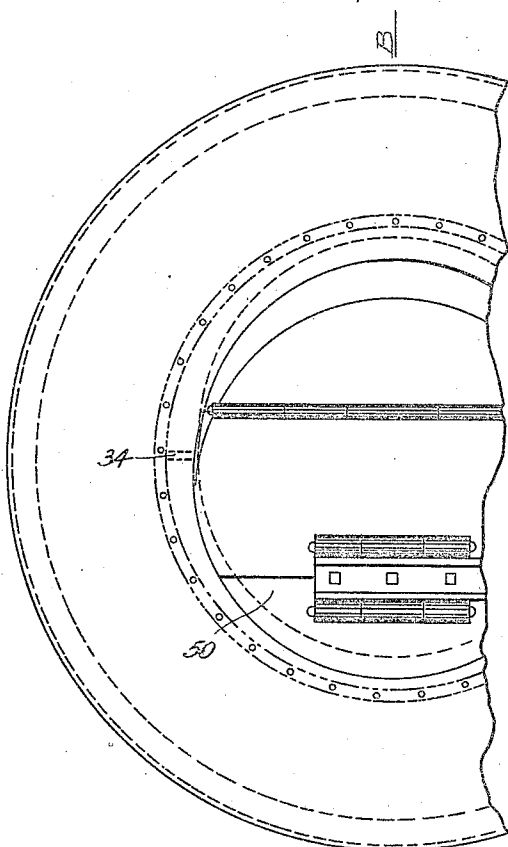


Fig. 8.

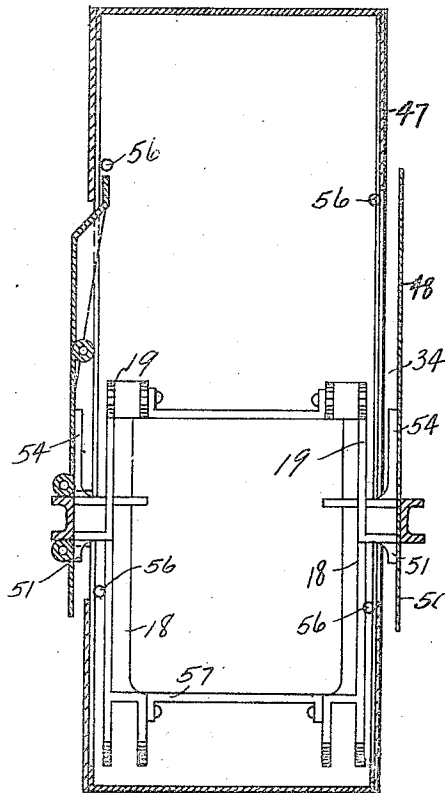


Fig. 9.

WITNESSES

B. H. French

Frances French

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CHARLES D. ELLWOOD

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# UNITED STATES PATENT OFFICE.

CHARLES D. ELLWOOD, OF MADISON, WISCONSIN.

## TRACTOR.

1,237,494.

Specification of Letters Patent. Patented Aug. 21, 1917.

Application filed August 25, 1915. Serial No. 47,344.

*To all whom it may concern:*

Be it known that I, CHARLES D. ELLWOOD, a citizen of the United States, residing at Madison, in the county of Dane and State of Wisconsin, have invented certain new and useful Improvements in Tractors, of which the following is a specification.

My invention relates to tractors having the engine disposed within and over the center of the traction wheel; and the objects of my invention are as follows:—

First: to have the entire weight of the motive power, supports, gearing and shafting supported directly over the central portion of the traction wheel.

Second: to provide a convenient and efficient frame between which the traction wheel is secured, and to which the steering gear is attached and making it possible to dispose the weight of the motive power, supports, gearing and shafting over the center of the traction wheel.

Third: to provide closure means for the entire wheel whereby dust can be excluded from the working mechanism and at the same time render the mechanism accessible for purpose of repairs, replenishment of fuel and water supply tanks from the outside of the machine.

Fourth: to provide steering means whereby the machine is guided in its desired course by means of a divided frame pivoted approximately the longitudinal center making very short turns possible.

Fifth: to dispose the driving shaft between the duplicate portions of the cradle so as to insure a perfect balance and making possible a direct application of power to the ring gear.

Sixth: to construct a complete tractor fully inclosed and secure from dust at a low cost to permit of its use by farmers and others possessing limited means.

Seventh: to provide a controlling means and steering gear that makes it possible for almost the entire weight of the tractor to be supported centrally over the traction wheel.

Eighth: to provide a tractor having a single traction wheel and having the entire driving mechanism inclosed within the same.

I attain the above and other objects apparent upon perusal of the specifications by the preferred form of mechanism illustrated in the accompanying drawings in which—

Figure 1, is a plan of my machine, Fig. 2, is a side elevation, Fig. 3, a plan showing the

arrangement of the engine connections, Fig. 4, a side elevation of the cradle, Fig. 5, an end elevation of the cradle, Fig. 6, a plan of the frame, Fig. 7, a side elevation of the same, Fig. 8, a front elevation of the hinged closure, Fig. 9, a vertical section on line A—B, Fig. 8; Fig. 10, a plan of the pivotal members 36 and 40, and Fig. 11, a vertical section on line C—D, Fig. 10.

Similar characters of reference refer to corresponding parts throughout the several views.

The outer shell 1, the flange 2, the channels 3, and the ring gear 4, constitute the frame work of my traction wheel. The main frame 16 is formed from channel iron bent to the desired shape, the two sides being duplicates and are bolted together in horizontal alignment for a distance from their rear ends thereby forming a bifurcated frame. Between the forks on the front end thereof is secured a cradle or frame, comprising two side members 19, with a leg 18, depending from the center thereof and two arms 19, extending upward and outward, the terminals being ninety degrees from the leg each way. Said cradle is secured between the forks at the front end of the bifurcated frame by means of the bolts 17. The side members aforesaid are connected internally by the braces 20, 21 and 22, which are securely bolted thereto. At the bifurcated ends of the legs 18, and the arms 19, are revolvably disposed on pins 23, the rollers 24, adapted to revolve in the channels 3, see Figs. 2 and 3.

Upon the braces 21 and 22 are located the journal boxes 25 and 26. Journaled in said boxes is the shaft 27 and to the inner end of said shaft is secured the spur gear 14. On the outer end of said shaft is disposed the pinion 28, which is in mesh with the ring gear 4. Across the cradle from side to side at the center thereof is disposed a motive power which is securely bolted to the lateral flanges 29, by the bolts 30. One end of the motive power shaft extends a distance outside of the balance wheel and a spur pinion 13, is disposed thereon. Said pinion meshes with the spur gear 14. Intermediate the boxes 25 and 26 on shaft 27 is located a reverse gear 31, operated by the lever 32. Said lever passes to the outside of the stationary closure plate 48, through the aperture 34. Between the braces 21 and 22 adjacent the reverse gear is disposed the fuel receptacle 55 for supplying the engine.

Said fuel receptacle is connected to the engine by any suitable piping. Between the side plates 19, adjacent the brace 20 is secured a tank 35 to contain a cooling medium for the engine which is properly connected by pipes thereto. As before described the frame 16, forward of the parallel portion is so shaped that it forms a surface to the underside of which is bolted an annulus 36, forming the upper member of the pivotal center of the steering gear. To the top of the frame concentric with the member 36, is disposed and bolted, the housing 37, in which a worm and worm gear 38; is disposed in operative relation to each other. A shaft 39 is journaled in the housing 37 at its upper end and passes downward through the gear 38, to which it is keyed. The lower end of said shaft passes below member 36, through the hub on member 40 which forms the lower member of the pivotal center of the steering gear. The said member 40, is bolted to the top of channel iron brace 41, making the movement of the two members co-incident. The ends of the brace 41, diverging are fastened to the ends of the guide race 42, which is curved concentric with the shaft 39. A roller 43, is revolubly mounted between the depending lugs 44, secured under the extreme end of frame 16, and travels in the race 42, thus adding stability to the steering gear mechanism. By the race extending beyond the axle 45<sup>a</sup> to which it is bolted by means of the bolt 46, and the end of the frame bearing thereon through the roller 43, I relieve much of the strain that would otherwise come on the shaft 39, and by dividing the weight between the two points greatly facilitate the steering of the machine. The shaft 45<sup>a</sup> which is secured to the worm meshing with worm gear 38, can be connected to a rod passing back of the tractor to a plow or other implement or vehicle that the tractor may be engaged in hauling, which is very desirable in some cases.

The rod 46<sup>a</sup> attached to the lever 32, for operating the reverse gear can also be extended back of the machine thereby placing the control of all movements of the tractor conveniently within reach of the driver occupying a position on the trailer.

To the outside of one of the flanges 2, is secured the plate 47 extending a distance toward the center of the wheel. A round plate 48 of slightly greater diameter than the aperture in plate 47 is rigidly secured to the inside of the frame 16 in a position to cover said aperture. To the other side of the wheel a plate 49 is secured to the flange 2. Said plate being similar to plate 47. The aperture in plate 49 extends both above and below the main frame 16 and the lower portion is covered by a simple swinging door 50, which is hingedly attached to the frame

and spaced the desired distance from the wheel by the depending brackets 51. To the upper side of the frame in register with the aperture above the frame is hingedly attached the two leaf folding doors 52 and 53. The upper leaf 52, around the curved portion is inclined inward and then upward and forms a flange to deflect sand or gravel, to the outside of the closure. Said folding door is positioned by abutting the standards 54. The engine or motive power aforementioned will exhaust within the wheel casing for the purpose of expelling dust and the like from the working parts by means of the exhaust being piped in any convenient manner to the tube annulus 56 which is spaced and drilled on the outer side adjacent the aperture between the fixed and movable cover plates of the wheel and is secured to the cradle sides. A brace 57 is bolted between the legs 18, of the cradle adjacent the lower ends thereof.

Having hereinbefore fully described my invention what I claim as new and my own invention is—

1. In a tractor, in combination with a single traction wheel, channels or runways disposed within the wheel at each side thereof and a ring gear disposed intermediate the channels or runways aforementioned, a cradle disposed within the wheel and comprising duplicate parts spaced apart by transverse braces, said parts comprising a horizontal central section, legs depending therefrom and outwardly and upwardly extending arms, the terminals of the arms and depending legs being in the same plane, said terminals being bifurcated and adapted to carry rollers, said rollers being disposed within the channels or runways aforementioned substantially as and for the attainment of the objects hereinbefore set forth.

2. In a tractor, in combination with a single traction wheel, channels or runways disposed within the wheel at each side thereof and a ring gear disposed intermediate the channels or runways aforementioned, a cradle disposed within the wheel and comprising duplicate parts spaced apart by transverse braces and supported by rollers guided by the channels or runways aforementioned, a motive power mounted centrally between said duplicate parts and geared to a jack-shaft, said jack-shaft carrying a pinion, engaging the ring gear at its horizontal center, the weight of said motive power, support, gearing and shafting being disposed over the center of the traction wheel, substantially as and for the attainment of the objects hereinbefore set forth.

3. In a tractor, the combination with a single traction wheel, channels or runways disposed within the wheel at each side thereof, a ring gear disposed intermediate the

channels or runways, a cradle disposed within the wheel and comprising duplicate parts spaced apart by transverse braces, a motive power mounted centrally between said duplicate parts and geared to a jack-shaft, a reverse gear disposed intermediate the ends of the jack-shaft, the operating lever of the reverse gear extending outwardly through the stationary closure plate and adapted to be operated by a push rod, said push rod operated from the driver's position at the rear of the machine, substantially as and for the attainment of the objects hereinbefore set forth.

4. In a tractor, the combination with a single traction wheel, channels or runways disposed within the wheel at each side thereof, a ring disposed intermediate the channels or runways, a cradle disposed within the wheel and comprising duplicate parts spaced apart by transverse braces, a motive power mounted centrally between said duplicate parts and geared to a jack-shaft, said jack-shaft carrying a pinion engaging the ring gear aforesaid, a tank adapted to hold a cooling solution mounted on the cradle to the rear of the engine and piped thereto, a tank mounted on said cradle forward of the motive power adapted to contain a fuel supply, said tank being connected by suitable piping to the motive power aforesaid, substantially as and for the attainment of the objects set forth.

5. In a tractor, the combination with a single traction wheel, channels or runways disposed within the wheel at each side thereof, a ring gear disposed within the wheel and intermediate the channels or runways, a cradle disposed within the wheel and provided with integral members extending outside of the wheel, a bifurcated frame secured to said outwardly extending members, said frame extending rearwardly beyond said wheel thence curving inward to the diameter of the cup and cone members of the steering gear and following around said members to the longitudinal center of the traction wheel, thence backward over the axle and to the underside of which is secured a roller adapted to follow a curved track, substantially as described and for the attainment of the objects set forth.

6. In a tractor, the combination with a single traction wheel, a cradle within the wheel, a frame secured to the cradle at the front end thereof, a cup member secured to the underside of the frame in register with the curved portions thereof, a cone member adapted to engage said cup member, a diverging brace upon which said cup member is mounted, the central portion of said brace conforming to the contour of said cone member, a curved channel or runway mounted upon an axle the ends of said curved channel or runway secured to the extremi-

ties of said diverging brace, said curved channel or runway adapted to guide a roller on the end of the frame, an axle secured to and beneath said curved channel or runway and carrying a wheel on each end thereof, substantially as and for the attainment of the objects set forth.

7. In a tractor, the combination with a single traction wheel, a cradle disposed within the wheel, a frame secured to said cradle at the front end thereof, cup and cone members engaging each other, a shaft secured centrally in the cone member, a housing mounted on top of the frame concentric with said shaft, a worm gear disposed on and secured to said shaft within the housing, a worm wheel in mesh with said worm gear journaled within the housing, a rod secured to the shaft in said worm wheel and passing backward from said housing adapted to operate the steering gear aforementioned substantially as and for the attainment of the objects set forth.

8. In a tractor, in combination with a single traction wheel, a cradle within the wheel, a frame secured to the cradle, a stationary closure plate secured between said frame and said cradle and extending a distance over the side flanges of the wheel, an aperture within the closure plate through which the operating arm of the reverse gear is disposed substantially as and for the attainment of the objects set forth.

9. In a tractor, in combination with a single traction wheel, a cradle within the wheel, a frame secured to the cradle, a curved plate hingedly depending from the underside of said frame and extending a distance over the side flange of said wheel, a curved folding plate hingedly disposed on the top side of said frame and extending upward and inside of said side flange of said wheel, said plate abutting standards integral with said cradle, substantially as and for the attainment of the objects set forth.

10. In a tractor, in combination with a sheet metal wheel, side plates secured to said wheel, apertures in said side plates and closure members secured over said apertures by suitable attaching means, substantially as and for the attainment of the objects set forth.

11. In a tractor in combination with a single driving wheel provided with a ring gear co-axially mounted in the interior thereof, a motor and auxiliary appurtenances therefor disposed within said driving wheel, driving means including a clutch adapted to establish operative driving connection between said motive power and the said driving gear, a motive power supporting means for maintaining axial alinement with the said driving wheel by means of one or more sets of three or more co-plane rollers engaging respectively one or more circular interior

tracks or runways constituting co-axial elements of the said driving wheel and main frame members rigidly attached to the said motive power supporting frame and extending to form a part of the frame of the tractor.

In testimony whereof I affix my signature in the presence of two subscribing witnesses.  
CHARLES D. ELLWOOD.

Witnesses:  
T. C. RICHMOND,  
W. W. FRENCH.