

O. McG. COX.
TRACTION ENGINE.

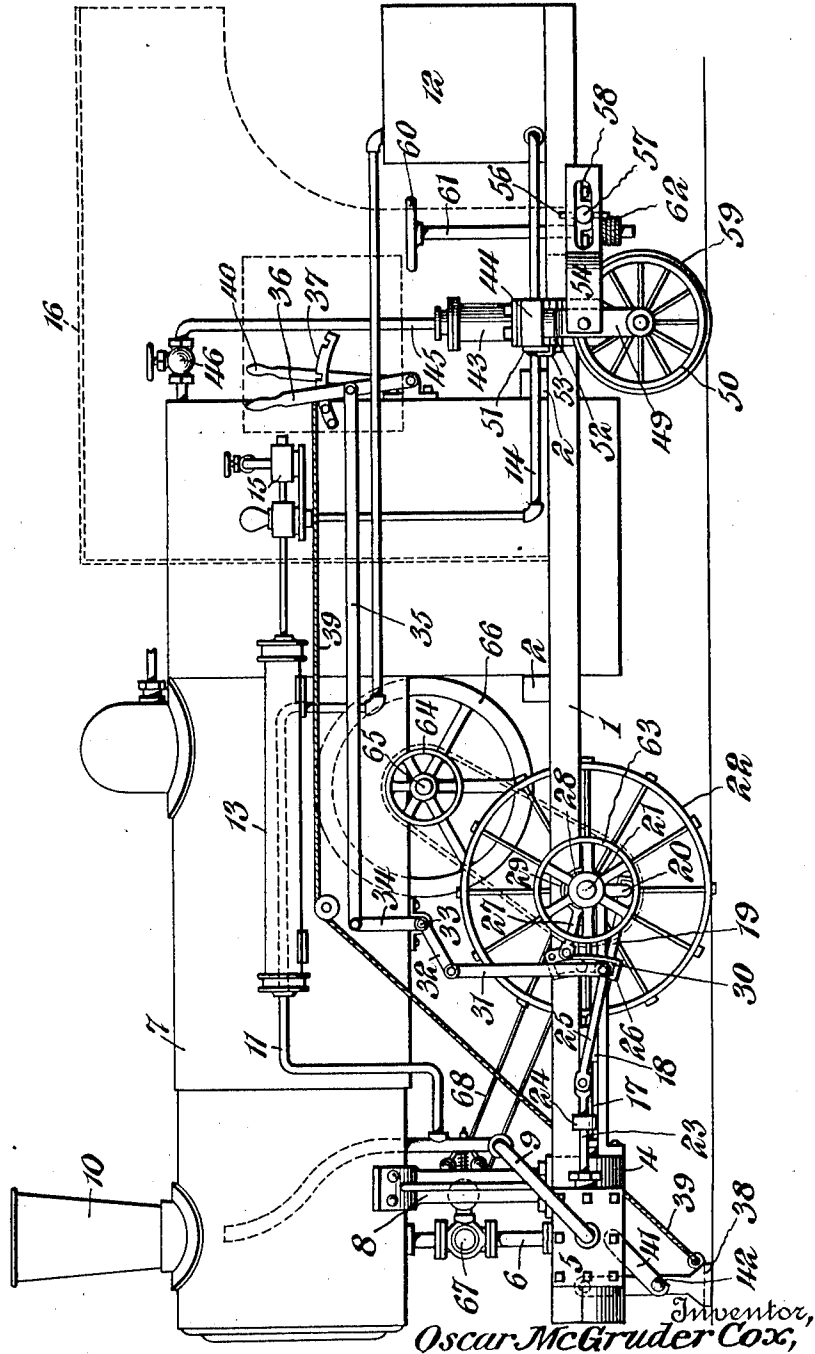
APPLICATION FILED MAY 4, 1910.

Patented May 13, 1913.

3 SHEETS-SHEET 1.

1,061,453.

Fig. 1.



Witnesses

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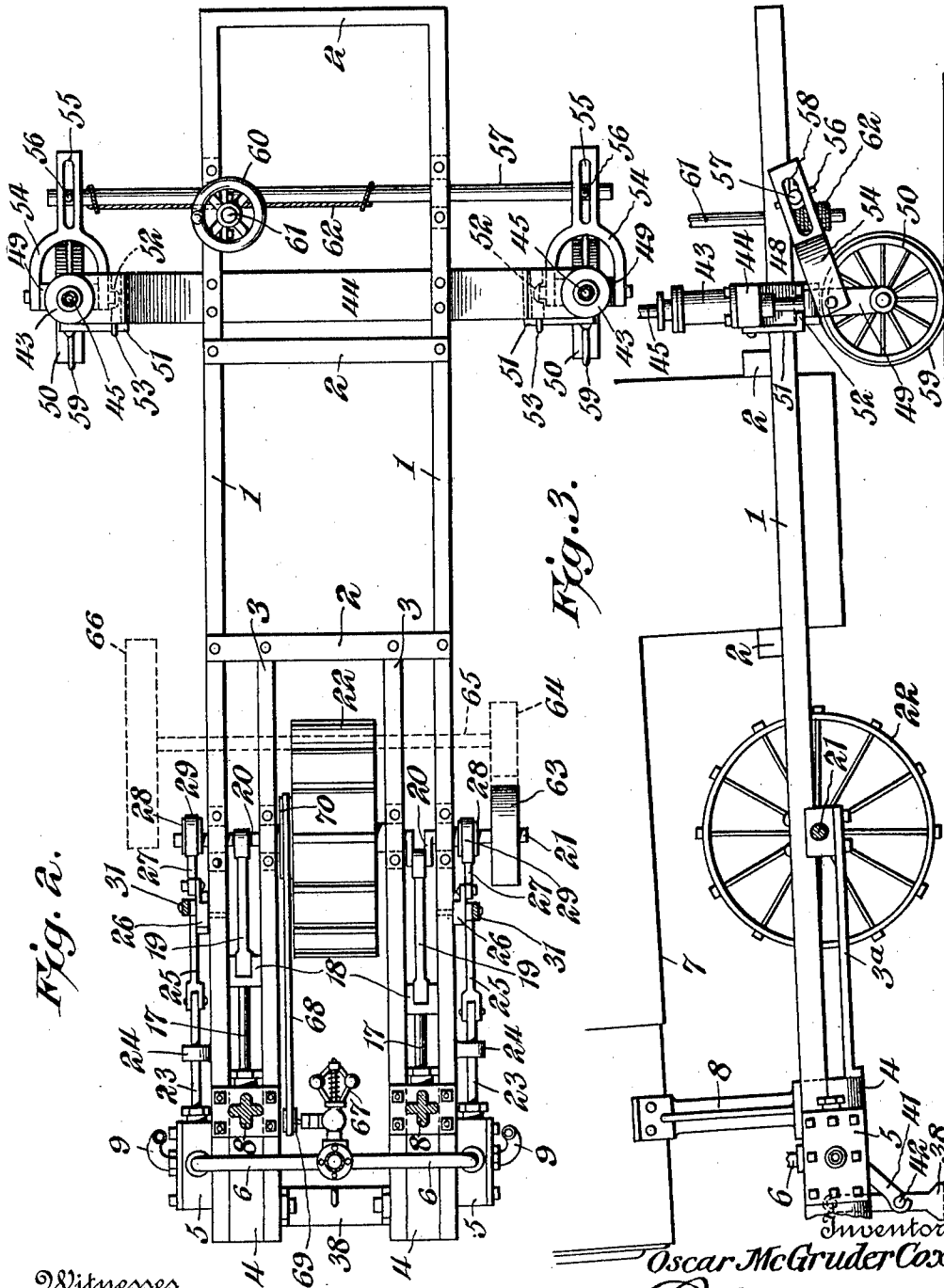


Fig. 2.

Fig. 3.

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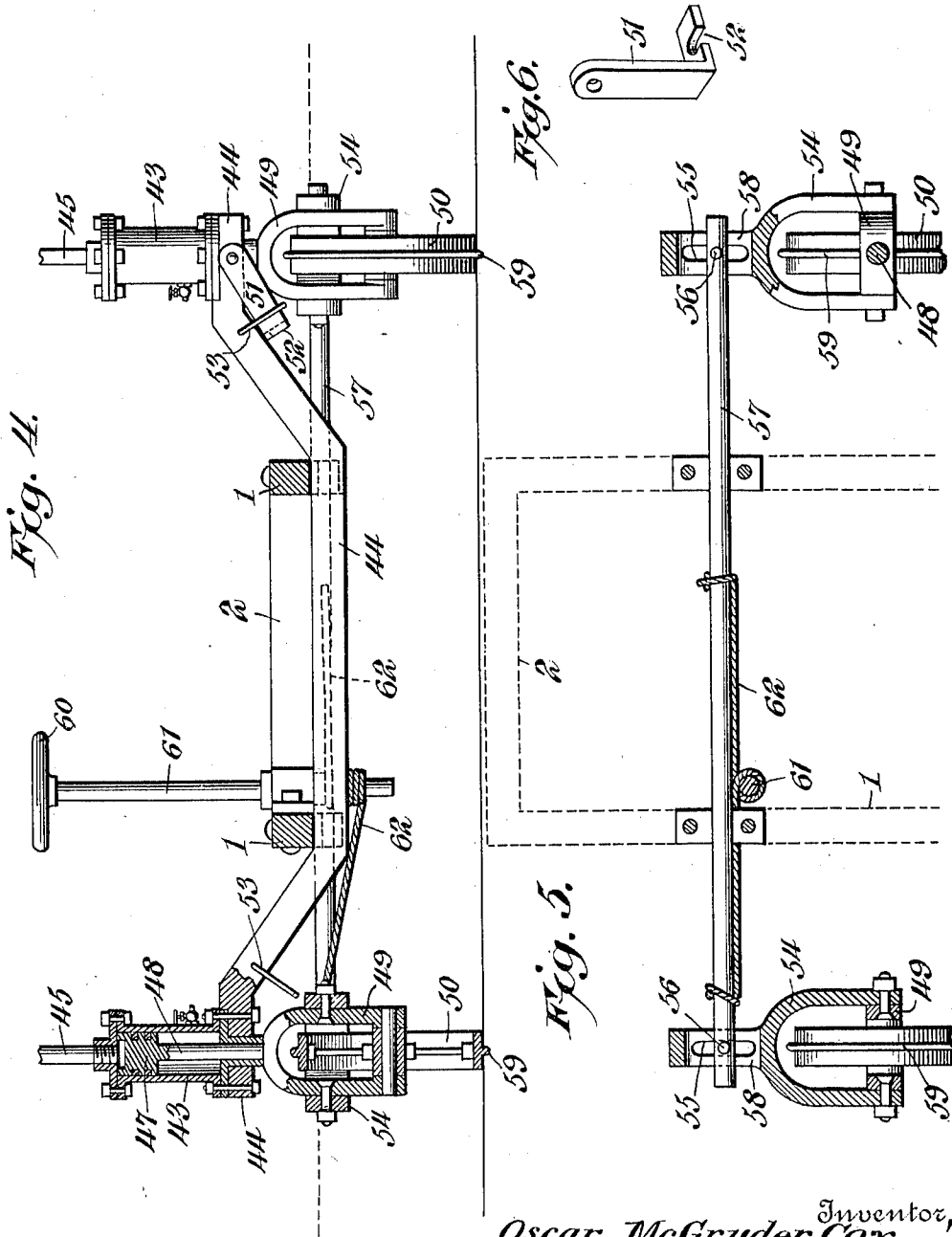
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UNITED STATES PATENT OFFICE.

OSCAR McGRUDER COX, OF PLAINVIEW, TEXAS.

TRACTION-ENGINE.

1,061,453.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed May 4, 1910. Serial No. 559,279.

To all whom it may concern:

Be it known that I, OSCAR McGRUDER COX, citizen of the United States, residing at Plainview, in the county of Hale and State of Texas, have invented a new and useful Traction-Engine, of which the following is a specification.

This invention relates to improvements in traction engines and has for its object the reduction of the number of parts so as to decrease the dead weight of the engine and consequently effect a more economical consumption of fuel and power than has heretofore been possible.

A further object of the invention is to produce a traction engine in which the traction wheel will be mounted on a crank shaft actuated directly from the engine cylinder so that there will be no loss of power through a long train of friction creating intermediate gearing.

A further object of the invention is to provide an efficient steering mechanism, and also to provide simple means whereby the machine may be held against traveling in order to utilize its power for the driving of a threshing machine or for other purposes.

The several stated objects, and such other objects as will hereinafter incidentally appear, are attained in the use of the mechanism illustrated in the accompanying drawings, and the invention consists in certain novel features thereof which will be hereinafter first fully described and then more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation of a traction engine provided with my improvements. Fig. 2 is a plan view with the boiler removed. Fig. 3 is a detail side elevation of the lower portion of the machine illustrating the manner of lifting the traction wheel from the ground in order that the machine may be maintained in one place and utilized to actuate machinery. Fig. 4 is a detail view of the steering mechanism, showing one side in vertical section and the other side in front elevation. Fig. 5 is a detail horizontal section of the steering mechanism. Fig. 6 is a detail perspective view of a shoe or prop intended for use in holding the traction wheel off the ground.

The main frame of the engine consists of side beams 1, connected by transverse beams

2, and inner longitudinal beams 3 extending from the innermost transverse beam 2 parallel with and adjacent the side beams 1, as shown most clearly in Fig. 2. The engine cylinders 4 are secured to and supported by the front ends of the beams 1 and 3 and are provided with steam chests 5 on their outer sides which communicate through feed pipes 6 with the boiler 7 which is supported on the main frame in any convenient manner.

In the arrangement illustrated in the drawings, the fire box at the rear end of the boiler will be bolted to the frame and support the rear end of the boiler, while the front end of the boiler will be supported by a truss 8 rising from the beams 1 and 3 near the front ends of the same. The exhaust pipes 9 lead from the steam chests up through the front end of the boiler to the smokestack 10 so as to create a forced draft through the combustion chamber, and a branch 11 of the exhaust pipe leads to a reservoir or water tank 12 to return the water of condensation thereto, an intermediate portion of the said branch 11 passing through the feed water heater 13 on the side of the boiler so as to raise the temperature of the said feed water before it is admitted to the boiler. The water for supplying the boiler is drawn from the tank or reservoir 12 through a pipe 14 connected therewith and leading to a pump 15 which is operated by steam from the boiler and serves to draw the water from the tank and force the same through the heater 13 into the boiler. A cab 16 is indicated in dotted lines in Fig. 1 to protect the engineer from the weather.

The pistons of the engines 4 have their respective piston rods 17 connected to cross heads 18 which are slidably mounted between and supported by the beams 1 and 3, and a guide plate 3^a arranged below the same, as shown in Fig. 3. A connecting rod 19 extends from each cross head to a crank 20 on the driving shaft 21 which also constitutes the axle for the traction wheel 22 which is rigidly secured to the said shaft at the center of the same. The cranks extend from the shaft at different angles. The cut-off valve which controls the flow of steam through the steam chest has its stem 23 extending through a guide 24 on the side of the beam 1, and the outer end of the said stem is pivotally connected to a connecting

rod 25 which has its rear end pivoted to a slide mounted in the grooved arcuate plate 26 which is pivoted at its center to the side beam 1. The upper end of this grooved plate is pivotally connected to the front end of a pitman 27 which is actuated by a cam or eccentric 28 secured on the driving shaft 21 and playing in a band or loop 29 secured to the rear end of the pitman. The rotation of the driving shaft under the influence of the engine will thus act upon the said pitman 27 through the cam or eccentric 28 and thereby oscillate the plate 26 so that the connecting rod 25 will reciprocate the valve stem 23 and thereby actuate the cut-off valve in the steam chest to alternately admit the steam to opposite ends of the cylinder in the well known manner. The slide 30, to which the rear end of the connecting rod 25 is pivoted, is mounted within the groove of the plate 26 and to the said block is secured a link 31 extending up to and connected with a crank arm 32 extending from a rock shaft 33 which is journaled in suitable supports on the under side of the boiler. A crank arm 34 projects upward from the said rock shaft at the side of the boiler and is connected by a rod 35 with a lever 36 mounted within the cab of the engine and held in any adjusted position by engagement with an ordinary rack 37. This lever 36 will transmit motion through the rod 35 and crank arm 34 to the rock shaft 33 so as to raise or lower the slide 30 through its connections with the crank arm 32 and link 31. When the slide is at one end of the plate 26 the engine will travel in one direction, but if the several elements be actuated to bring the slide to the opposite end of the plate, the engine will be reversed and will travel in the opposite direction.

It will be observed, upon reference to Fig. 2, that I provide an engine at each side of the machine and each engine is coupled directly to the driving shaft on which the traction wheel is mounted. In this manner I am enabled to support the engine on a single traction wheel arranged in the longitudinal center of the machine and positively actuate the said wheel, even while the engine is turning a corner or describing curves, without any liability of bending or breaking the axle or driving shaft and without employing any complicated compensating gears or any long train of gearing.

Between the front ends of the engine cylinders and to the inner sides of the same, I pivotally secure a prop or supporting frame 38 which is normally held in a raised position between the cylinders by means of a cable 39 attached thereto and extending back to a point within the cab where it is secured to a controlling lever 40. When it is desired to arrest the travel of the traction engine and couple the same to a threshing

machine, or otherwise utilize the power created by the engine, the lever 40 is thrown forward so as to release the prop or supporting frame 38 which will thereupon drop to the position illustrated and rest upon the ground. A latch 41 pivoted at a convenient point upon the frame may then be engaged over a pin 42 on the prop to hold the prop firmly in its upright position. In order to lift the rear end of the machinery and thereby raise the traction wheel 22 from the ground, I provide cylinders 43, at the outer ends of a cross beam or yoke 44, to which steam may be admitted through pipes 45 communicating with the steam space of the boiler and controlled by a valve 46 within the cab. Pistons 47, mounted within the cylinders 43, have their rods 48 extended through the lower ends of the cylinders and equipped with yokes 49 between the lower ends of which the steering wheels 50 are mounted. When steam is admitted to the upper ends of the cylinders 43, the pistons will be driven downward and, the wheels 50 being upon the ground, the rear end of the main frame, with the machinery resting thereon, will be raised so that the traction wheel will be lifted from the ground and further operation of the engines will consequently not cause the machine to travel.

When the rear end of the main frame has been raised to the desired extent, as indicated in Fig. 3, shoes 51, which are loosely pivoted upon the cross beam 44, are swung downward and their lower forked ends 52 carried over the yoke 49 so as to rest thereon and engage the piston rod 48 whereby the collapse or dropping of the frame, when the steam pressure in the cylinder 43 is reduced, will be prevented. When these shoes are not in use, they are held in their upper position, as shown in Fig. 4, by means of keepers 53 which are pivoted upon the cross beam or truss 44 and are adapted to engage the lower edge of the shoe, as will be readily understood. It will be understood, of course, that the shoes 51 have forked ends in order to fit around the piston rods 48 and thereby obtain a firm bearing on the upper ends of the yokes.

To the outer sides of the yokes 49, which carry the steering wheels 50, I pivot the ends of rearwardly projecting forked levers 54 which are provided with longitudinal slots 55 receiving the ends of pins 56 at the ends of a coupling rod 57. The ends of the coupling rod 57 play through longitudinal slots 58 in the lever 54, arranged at right angles to and intersecting the slots 55 in the said levers. The horizontally disposed slots 58 permit the ends of the sliding coupling bar 57 to move through the levers 54 as the same are swung to one side, while the vertical slots 55 engage the pins 56 so that the lateral movement of the coupling rod, relative

to the traction engine, will be transmitted to the levers 54 to actuate the same and thereby turn the yokes 49 upon the piston rods 48 as centers and, consequently, vary the angle of the steering wheels relative to the longitudinal line of the machine and thereby cause the machine to turn to either side, as may be desired.

In order that the steering wheels may more effectually perform their functions, I prefer to form central annular ribs 59 thereon which will take into the ground and thereby more completely cause a lateral movement of the machine to change the line of travel. The coupling rod 57 is slidably mounted in suitable bearings in the main frame and is caused to move transversely in the said bearings by a hand wheel 60, on the upper end of a steering post 61 around which is wrapped a cable 62 secured to the said steering post and having its ends secured to the coupling rod 57 at opposite sides of the steering post. It will thus be readily seen that by rotating the hand wheel, the coupling rod will be caused to slide to one side and, consequently, turn the steering wheels so as to cause the traction engine to travel in the desired direction.

In order that the power of the traction engine may be transmitted to driven machinery when the engine has been raised from the ground, as indicated in Fig. 3, I provide a band pulley 63 on the end of the driving shaft 21 which may be connected by a suitable belt, with a band pulley 64 on one end of a countershaft 65 journaled in suitable bearings on the under side of the boiler and having a combined fly wheel and transmitting pulley 66 on its opposite end. A belt may be placed around the fly wheel 66 and carried to the threshing machine or other apparatus which it is desired to operate. If the traction wheel should drop into a hole, or the travel of the apparatus be otherwise impeded, the obstruction may be overcome by admitting steam to the cylinders 43 without lowering the prop 38 or stopping the engines. The steering wheels will then act as a fulcrum from which a lifting impulse will be applied to the frame which will enable the traction wheel to quickly clear the obstruction. A governor 67 is provided to regulate the speed of the engine, and this governor is connected with the steam pipe 6 and actuated by a belt 68 and pulleys 69 and 70, as shown.

The advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is

merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described my invention, what I claim is:—

1. A traction engine provided with a boiler elongated in the direction of the length of the engine, steering wheels at one end of the traction engine, a traction wheel in substantially the longitudinal center line of the boiler and underneath said boiler and located between the ends of the boiler, and driving engines for the traction wheels located at that end of the boiler and side of the traction wheel remote from the steering wheels. 70 75 80

2. A traction engine provided with a boiler, steering wheels at one end of the traction engine and power engines at the other end of the traction engine, and a traction wheel located in substantially the longitudinal center line of the boiler underneath the same and intermediate of the power engines and steering wheels, said power engines being connected to the traction wheel for driving the same. 85 90

3. A traction engine provided with a supporting frame carrying steering wheels adjacent one end and driving engines adjacent the other end, a traction wheel mounted in substantially the longitudinal center line of the frame between the driving engines and the steering wheels and connected to the engines for actuation thereby, and a boiler elongated in the direction of the length of the frame and supported thereby in overriding relation to the frame above the traction wheel and engine, the boiler extending beyond the traction wheel to substantially that end of the frame carrying the engines. 95 100 105

4. A traction engine provided with a main frame, a driving shaft mounted transversely thereof, a single traction wheel secured to said driving shaft in substantially the center line of the main frame, power engines carried by the front end of the main frame at the sides thereof and directly connected to the driving shaft, and a boiler elongated in the direction of the length of the frame and supported thereon directly above and in overriding relation to the traction wheel and also above the power engines, the traction wheel being located nearer to the middle portion of the traction engine than the power engines. 110 115 120

5. In a traction engine, the combination with a main frame and boiler, a driving shaft mounted on the frame below the boiler and provided with cranks, a traction wheel mounted on the shaft between the cranks and located directly underneath the boiler, and power engines mounted on the frame below the boiler and having their piston rods connected directly to the cranks of the said shaft, the traction engine having 125 130

other supporting means than the traction wheel in spaced relation to the latter and the boiler and power engines overhanging the traction wheel beyond that side of the latter remote from said other supporting means.

6. In a traction engine, the combination with a main frame and boiler, a driving shaft mounted on the frame and provided with cranks at opposite sides of the center, a traction wheel mounted on the said shaft between the cranks and disposed directly underneath the boiler in the median line of the machine, and power engines mounted on the frame at opposite sides of and below the boiler and having their piston rods connected directly to the cranks of the said shaft, the traction engine having other supporting means than the traction wheel in spaced relation to the latter and the boiler and power engines overhanging the traction wheel beyond that side thereof remote from said other supporting means.

7. In a traction engine, the combination with a main frame and boiler, a driving shaft mounted on the frame below the boiler and provided with cranks near each end, a traction wheel mounted on the driving shaft between the said cranks and disposed directly underneath the boiler, engines mounted on the frame at each side of and lower than the boiler and having their steam chests on the outer sides of the cylinders, piston rods leading from the cylinders and connected directly with the cranks of the driving shaft, and direct connections between the ends of the said shaft with the

valves in the steam chests for actuating the same.

8. In a traction engine, the combination with a main frame and boiler, a driving shaft mounted on the frame below the boiler and provided with cranks, a traction wheel mounted on the driving shaft and disposed directly underneath the boiler, engines mounted on the frame below the boiler and having their steam chests on the outer sides of the cylinders, piston rods leading from the cylinders and connected directly with the cranks of the driving shaft, valve rods extending from the steam chests and connected directly with the end of the driving shaft, and a band wheel on the extreme end of said shaft.

9. In a traction engine structure, a boiler, steering wheels located at one end of the structure, and a traction wheel and driving means therefor located at the other end of the structure with the traction wheel in the longitudinal center line of the boiler, substantially intermediate of the length of the boiler and wholly underneath said boiler and all the driving members being located at a lower level than the bottom of the boiler.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

OSCAR McGRUDER COX.

Witnesses:

JOHN H. SIGGERS,
DAVID R. WAGNER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."