

1,330,733.

C. J. BRITT.
TRACTION ENGINE.
APPLICATION FILED APR. 15, 1918.

Patented Feb. 10, 1920.

4 SHEETS—SHEET 1.

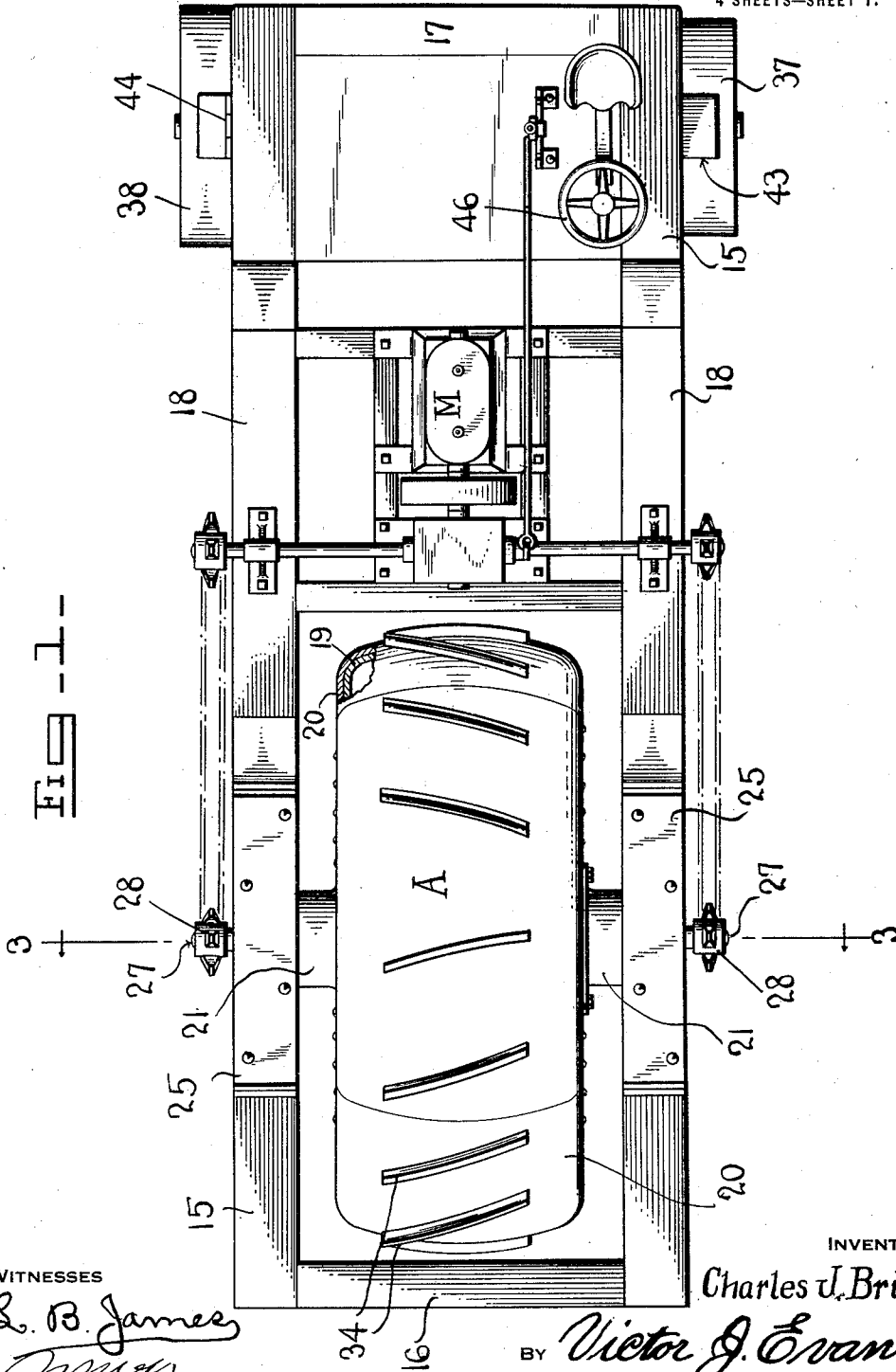


Fig. 1--

WITNESSES

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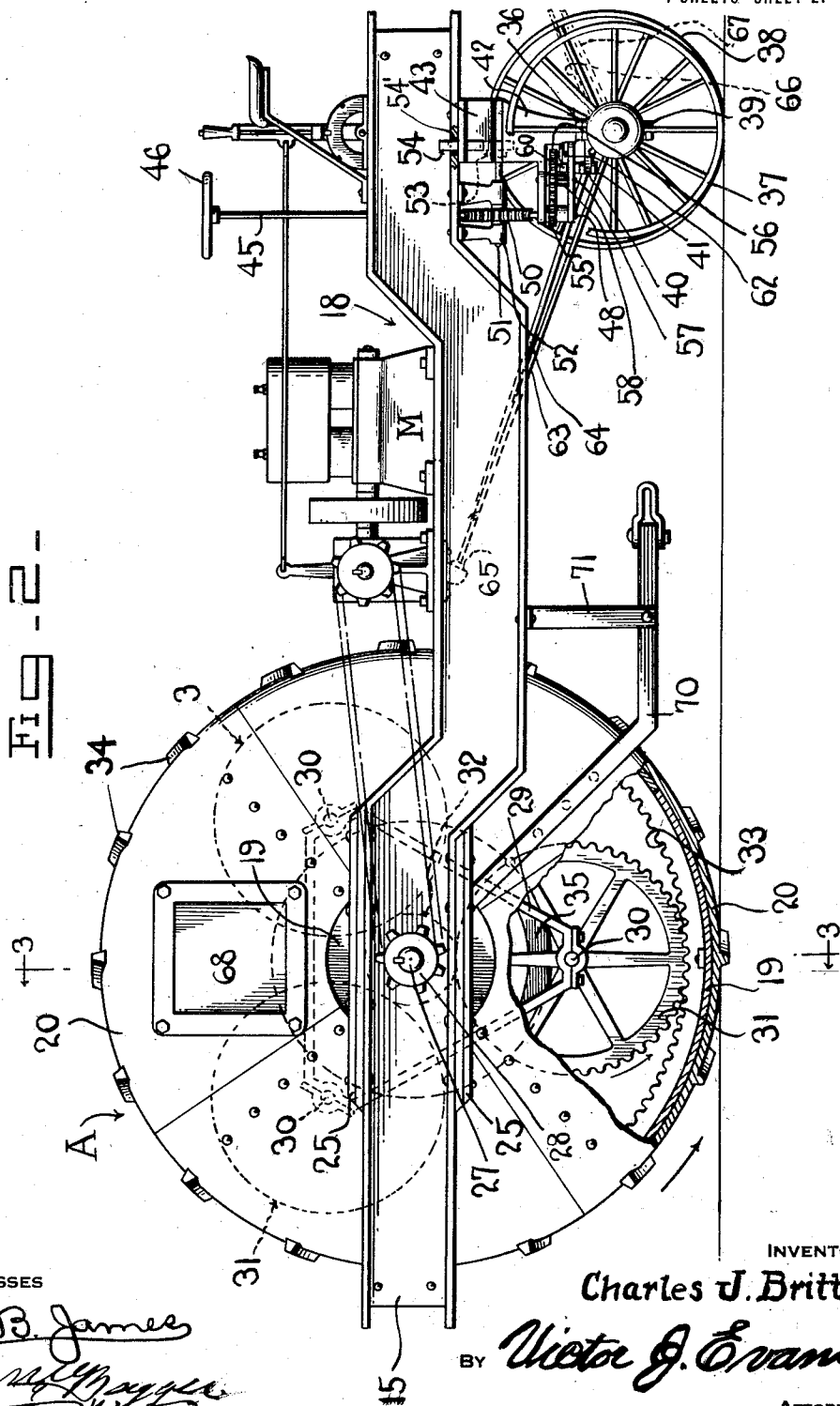
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WITNESSES

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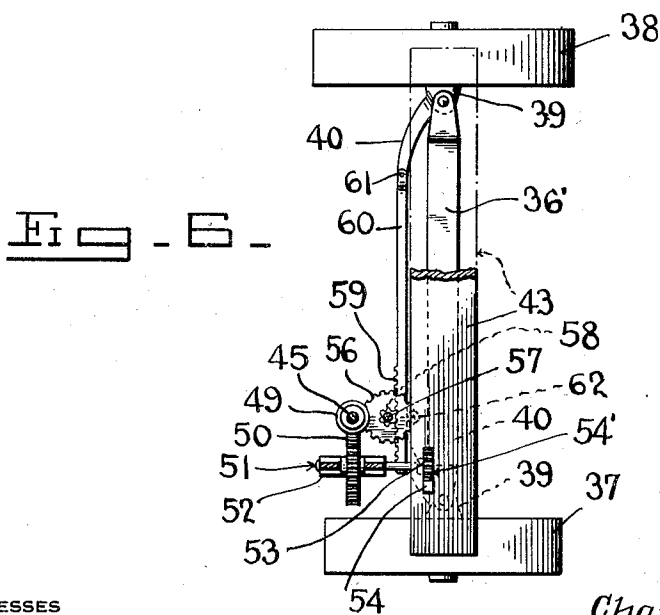
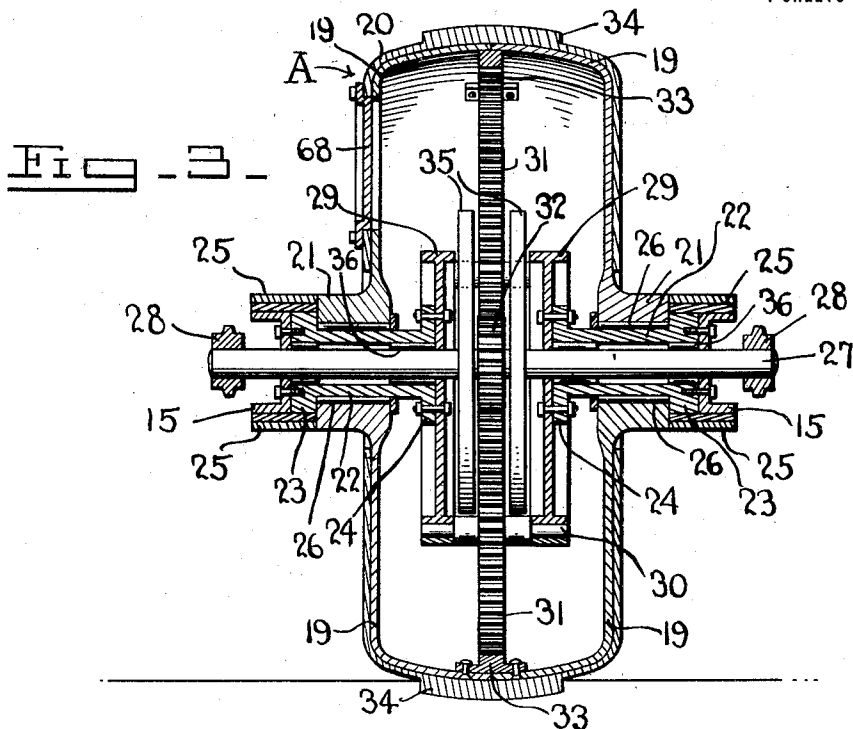
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4 SHEETS—SHEET 3.



WITNESSES

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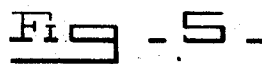
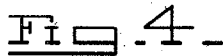
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APPLICATION FILED APR. 15, 1918.

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4 SHEETS—SHEET 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

CHARLES J. BRITT, OF WILLINGTON, SOUTH CAROLINA.

TRACTION-ENGINE.

1,330,733.

Specification of Letters Patent.

Patented Feb. 10, 1920.

Application filed April 15, 1918. Serial No. 228,709.

To all whom it may concern:

Be it known that I, CHARLES J. BRITT, a citizen of the United States, residing at Willington, in the county of McCormick and State of South Carolina, have invented new and useful Improvements in Traction-Engines, of which the following is a specification.

This invention relates to traction engines and it has particular reference to a three-wheel tractor.

The invention has for its object to produce a three-wheel tractor for general use which will be of simple and improved construction both as regards the driving mechanism and the steering mechanism as well as other detailed parts of the machine.

A further object of the invention is to produce a driving mechanism of simple and improved construction embodying a large ground wheel consisting of a hollow casing within which the transmission and driving mechanism is located.

A further object of the invention is to produce a simple and improved construction whereby, in steering, the large driven ground wheel will be tilted in the direction in which the machine is to be driven.

A further object of the invention is to produce a simple and improved steering gear whereby a pair of steering wheels will be actuated simultaneously with the tilting parts of the invention.

With these and other ends in view which will appear as the nature of the invention is better understood, the same consists in the improved construction, arrangement and combination of parts which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawing has been illustrated a simple and preferred form of the invention, it being, however understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the claims may be resorted to when desired.

In the drawings:—

Figure 1 is a top plan view of a tractor constructed in accordance with the invention.

Fig. 2 is a side elevation partly in section.

Fig. 3 is a transverse sectional view taken on the line 3—3 in Fig. 1, said section being

laid axially through the ground engaging driving wheel.

Fig. 4 is a rear elevation.

Fig. 5 is a sectional detail view taken on the line 5—5 in Fig. 4.

Fig. 6 is a horizontal detail view taken on the line 6—6 in Fig. 4.

Corresponding parts in the several figures are denoted by like characters of reference.

The frame of the machine which may be constructed of channel steel or other appropriate material includes the side members 15 and the front and rear cross bars 16, 17. The side members 15 are provided intermediate the ends thereof with downwardly offset portions 18 adapted to support a motor which is conventionally indicated by M.

The ground engaging driving wheel A consists of a spheroidal casing which for convenience in constructing and assembling is made of a plurality of sections, preferably four or more in number, said sections being produced by dividing the casing longitudinally and transversely. The individual sections, each designated by 19 are to be assembled together in any convenient manner and the casing is reinforced by a flanged rim or tire 20 of suitable U-shaped cross section, said tire being also, if desired, made up of a plurality of sections suitably assembled or connected together to form a rigid and durable structure. The side walls of the wheel casing are formed with thickened or reinforced portions constituting hubs 21 and extending through each hub is a sleeve 22, the outer and inner ends of which are provided with flanges designated, respectively by 23 and 24. The outer flange 23 of each sleeve is securely bolted to the side member 15 of the frame, said side member being reinforced as seen at 25 for the sake of strength and durability. Anti-friction rollers 26 are interposed between the sleeve 22 and the hub 21 through which the sleeve extends. The main axle or front axle extends through the sleeves 22 and through the side members of the frame, said axle being shown as being provided at the ends thereof with spur wheels 28 receiving power from the motor M, it being of course understood that any convenient well known means may be used for transmitting power from the motor to the axle.

Connected securely with the flange 24 at the inner end of each sleeve 22 is a frame 29,

here shown as being of triangular form. The frames 29, which will thus be supported rigidly with respect to the frame of the machine, afford bearings for equidistantly disposed shafts 30 of which three have been shown although it is to be understood that the number of said shafts may be varied provided that they are disposed equidistantly with respect to each other and in parallel relation with the axis of the shaft or axle 27. Each shaft 30 supports a gear wheel 31, each of said gear wheels being in mesh with a pinion 32 fixed on the axle 27 and each of said gear wheels being also in mesh with an internal gear 33 which is formed or fixed within the casing of the wheel A midway between the side walls thereof. In the drawings the internal gear is shown as being formed separate from the sections of the wheel, but it is to be understood that it may be cast upon or formed integrally therewith. It follows that when the axle is rotated by power received from the motor, motion will be transmitted through the gears 32 and 31 to the internal gear 33, thereby causing rotation of the wheel A. The latter is preferably equipped with ground engaging grouts 34 that will engage the surface of the ground so as to cause propulsion of the machine without danger of slippage. The axle 27 has been shown as being provided with fly wheels or balance wheels 35, the same being located adjacent to the frames 29. Anti-friction rollers 36 are interposed between the axle 27 and the sleeves 22 through which the axle extends.

The rear axle 36' of the improved machine is equipped with steering wheels 37, 38 of the ordinary automobile type, said steering wheels being supported by the steering knuckles 39, each having an arm 40, said arms being connected together by a rod or link bar 41. The wheel 38 is preferably of larger diameter than the wheel 37, and the rear axle will thus occupy a slightly tilted position which however, does not interfere with the use of the tractor for general purposes.

Supported on the rear axle by brackets or supporting members 42 is a transversely inclined bolster 43 with the high side of which one side member 15 of the main frame is connected by a hinge 44. The frame of the machine supports a vertical steering shaft 45 having a hand wheel 46, said shaft being connected by a universal joint 47 with another approximately vertical shaft 48, the latter being supported for rotation in brackets or bearing members associated with the rear axle 36 and supported on the latter. The steering shaft 45 is capable of sliding longitudinally in its bearings in the frame of the machine. The shaft 48 carries a worm 49 meshing with a worm gear 50 on a shaft

51 which is supported for rotation in a bearing lug 52 connected with the machine frame. The shaft 51 also carries a pinion 53 meshing with an arcuate rack 54 rising from and connected with the rear axle. Said rack is preferably guided through a slot 54' in the bolster 43, as clearly seen in Fig. 6. The worm shaft 48 carries a pinion 55 meshing with a spur wheel 56 on a shaft 57, said shaft carrying also a pinion 58 that meshes with a rack 59 at one end of a bar 60, the other end of which is pivotally connected at 61 with the arm 40 that extends from one of the steering knuckles 39. A thrust roller 62 serves to keep the rack 59 of the bar 60 in constant engagement with the pinion 58. Radius rods 63, 64 are connected with the axle 36' adjacent to the wheels 37 and 38, respectively, the forward ends of said radius rods being connected with one of the side members 15 of the frame structure by a ball and socket joint 65. Similar radius rods 66, 67 indicated in dotted lines in Fig. 2 may extend rearwardly with respect to the axle 36 when the frame structure of the machine extends rearwardly of the axle a sufficient distance to render the use of such additional radius rods desirable. It is obvious that the radius rods should be connected with one side member of the frame only in order to permit said frame to be tilted by the steering gear.

It is desirable to provide the casing of the main ground or driving wheel A with a manhole having a cover plate 68 in order to afford access to the interior without disassembling the wheel.

From the foregoing description taken in connection with the drawings hereto annexed, the operation and advantages of the improved tractor will be readily understood by those skilled in the art to which it appertains. A three-wheel tractor is peculiarly adapted to travel over uneven ground owing to the fact that the ground is engaged only at three points, thereby insuring stability and avoiding undue shaking and vibration. The improved traction wheel is driven direct from the motor by a very simple transmission which is located almost entirely within the wheel where it is free from dust and dirt, enabling the bearings to be maintained in a clean condition thereby avoiding friction and unnecessary wear on the parts. By properly proportioning the wheels of the transmission gearing, the speed and power may be regulated. In steering the machine the steering wheels 37, 38 will not only be turned in the proper direction by the action of the steering shaft, but at the same time the frame of the machine will be tilted with respect to the rear axle, thereby tilting the driving wheel A in the direction in which the turn is to be made, thereby greatly facilitating the turn-

ing of sharp corners. This tilting of the frame and the driving wheel, it will be observed, is effected simultaneously with the adjustment of the steering wheels and by mechanism actuated by the steering shaft. When the frame is tilted the bearings of the steering shaft will slide longitudinally of the latter, and the presence of the universal joint 47 will permit the necessary movement to take place without straining or breaking any of the parts of the device. The general construction of the improved tractor is simple and inexpensive, and it will be found to be thoroughly useful for a variety of purposes. It may here be mentioned that draft bars indicated at 70 have been shown connected with the ends of the axle 27, said draft bars extending downwardly and rearwardly and being supported by braces 71 connected with the side members of the frame. The draft bars may be connected together by a hitching bar 72 with which plows or other implements may be connected. It is obvious however, that no limitation is intended as to the manner of utilizing the tractor or the manner of connecting it with implements or vehicles to be drawn or operated thereby.

By arranging the bolster 43 in an inclined position as shown and connecting the main frame hingedly with the high side of the bolster the frame may obviously be dipped or tilted either to the right or to the left without interference by the bolster.

What is claimed, is:—

1. In a three-wheel tractor, a driving wheel comprising a substantially spheroidal casing having an internal gear, frames within the casing, means for supporting said frames stationary with respect to the wheel casing, shafts carried by the frames and having gear wheels meshing with the internal gear, an axle extending through the casing and having a pinion meshing with the gear wheels, and means for driving the axle, said axle being also provided with balance wheels disposed between the relatively stationary frames and the gear wheels.

2. In a three-wheel tractor, a driving wheel comprising a plurality of sections connected together to form a substantially spheroidal casing, in combination with a substantially U-shaped tire surrounding the casing to reinforce the same.

3. In a three-wheel tractor, a driving wheel comprising a plurality of sections connected together to form a substantially spheroidal casing, in combination with a substantially U-shaped tire surrounding the casing to reinforce the same, in combination with gearing disposed internally of the cas-

ing for the purpose of rotating the latter, a motor supported externally of the wheel casing, and means for transmitting power from the motor to the internal gearing.

4. In a three-wheel tractor, a main frame, a driving wheel comprising a casing having an internal gear and side walls provided with hubs, sleeves extending through the hubs and supporting the wheel for rotation, said sleeves being fixed on the main frame, frames fixed on the inner ends of the sleeves within the wheel casing, shafts supported for rotation on said frames and having gear wheels meshing with the internal gear, an axle extending through the sleeves and through the side members of the main frame, a pinion carried by the axle and meshing with the gear wheels within the wheel casing, a motor supported on the main frame and means for transmitting power from the motor to the axle to effect rotation on the driving wheel, in combination with balance wheels secured on the axle between the relatively stationary frames within the wheel casing and the gear wheels.

5. In a three-wheel tractor, a main frame, a driving wheel comprising a casing having an internal gear and side walls provided with hubs, sleeves extending through the hubs and supporting the wheel for rotation, said sleeves being fixed on the main frame, frames fixed on the inner ends of the sleeves within the wheel casing, shafts supported for rotation on said frames and having gear wheels meshing with the internal gear, an axle extending through the sleeves and through the side members of the main frame, a pinion carried by the axle and meshing with the gear wheel within the wheel casing, a motor supported on the main frame and means for transmitting power from the motor to the axle to effect rotation on the driving wheel, in combination with balance wheels secured on the axle between the relatively stationary frames within the wheel casing and the gear wheels, and anti-friction rollers interposed between the axle and the sleeves and between the latter and the hubs.

6. In a three-wheel tractor, a main frame, steering wheels spaced apart and supporting one end portion of the frame, a longitudinal central drive wheel supporting the other end portion of the frame and tiltable laterally as a unit with the frame, and means associated with the steering wheels for synchronously moving the steering wheels laterally and tilting the frame and the drive wheel as a unit.

In testimony whereof I affix my signature.
CHARLES J. BRITT.