No. 676,257. Patented June 11, 1901.

J. W. JAMES.

TRACTION ENGINE.

(Application filed Feb. 14, 1901.)

(No Model.) 2 Sheets—Sheet 1.

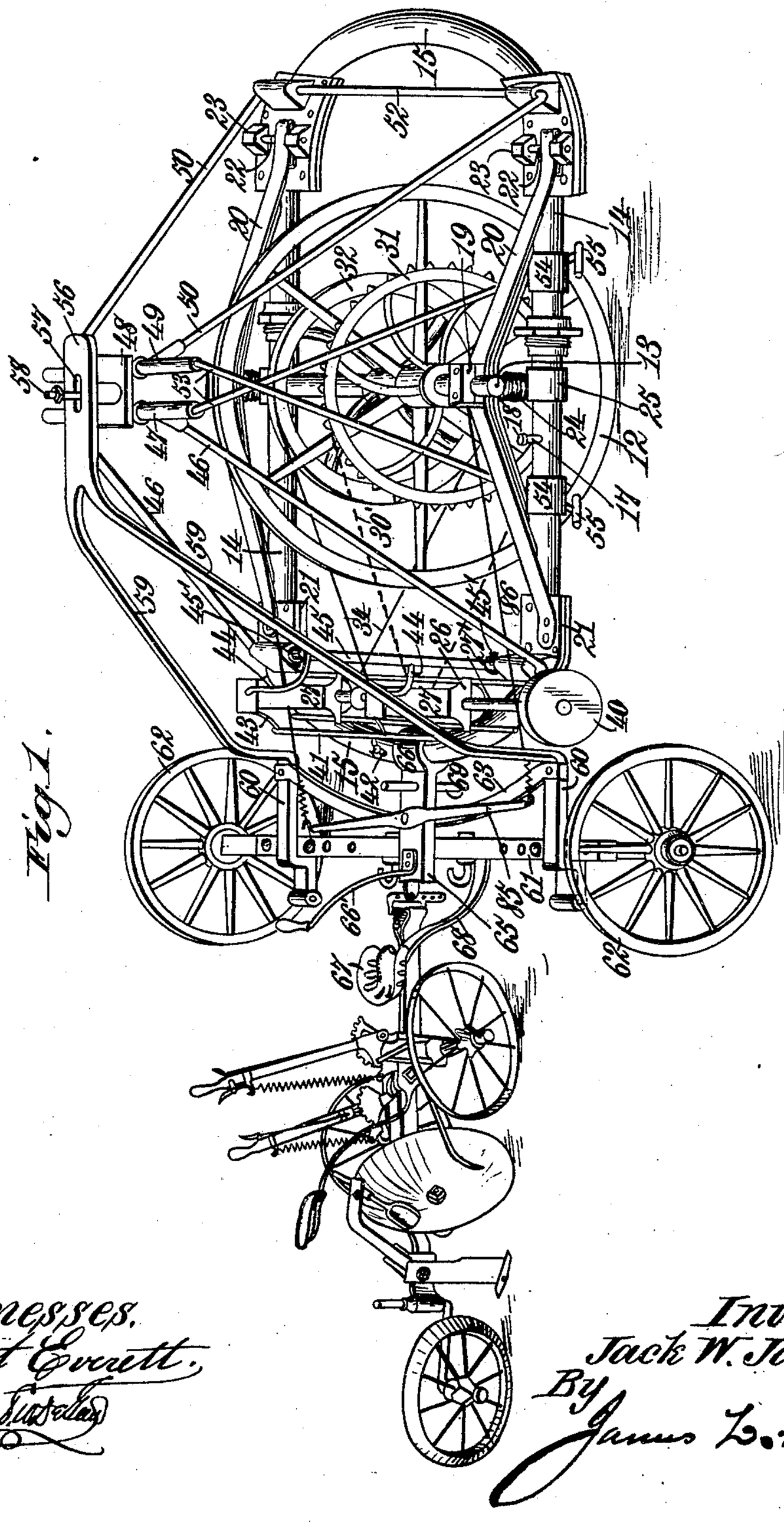


Fig. 1.

Witnesses.
Robt. Everett.
Wm. Littlefield

Inventor.
Jack W. James.
By James L. Norris
Atty.

No. 676,257. Patented June 11, 1901.

J. W. JAMES.

TRACTION ENGINE.

(Application filed Feb. 14, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

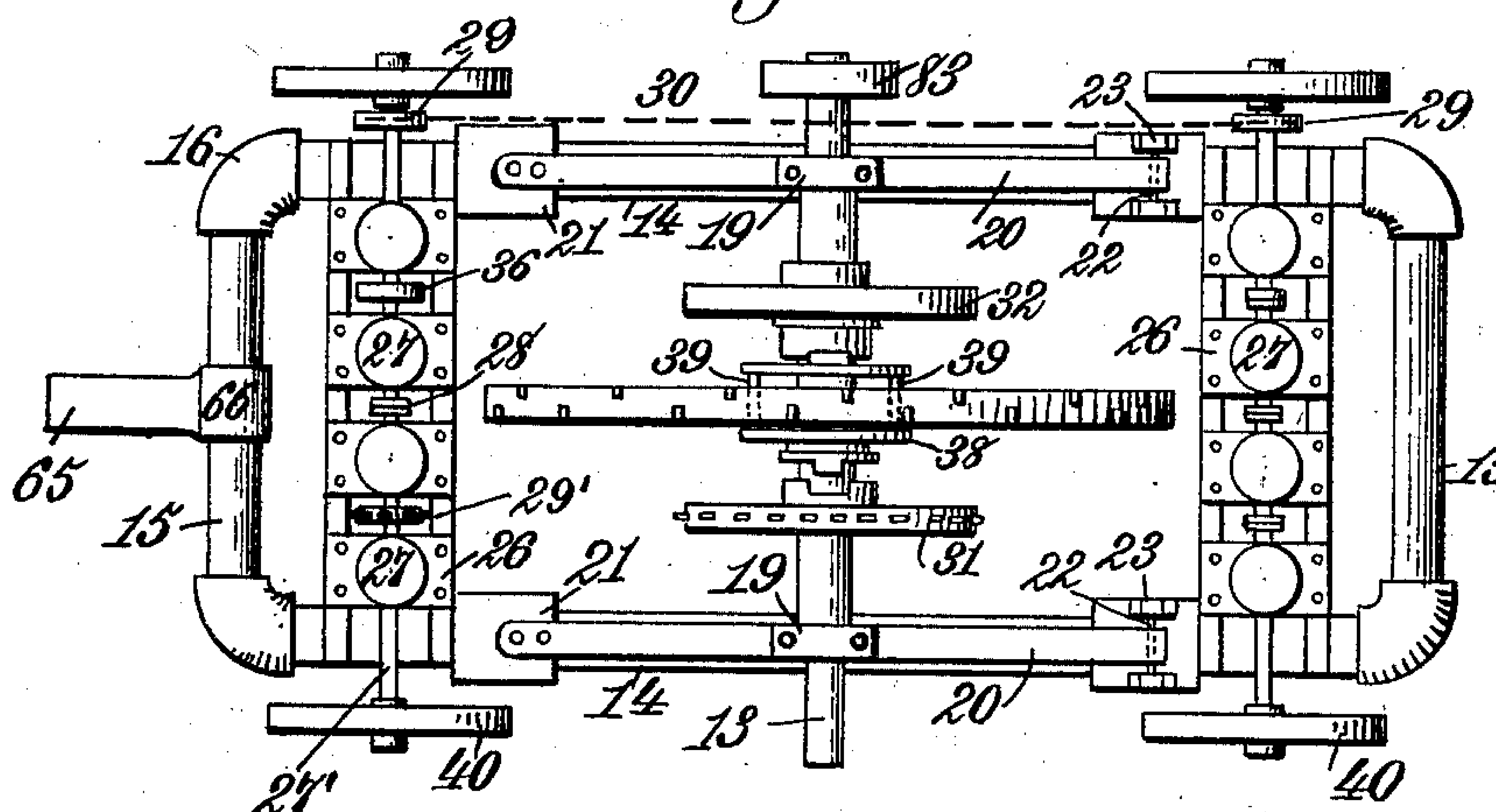


Fig. 3.

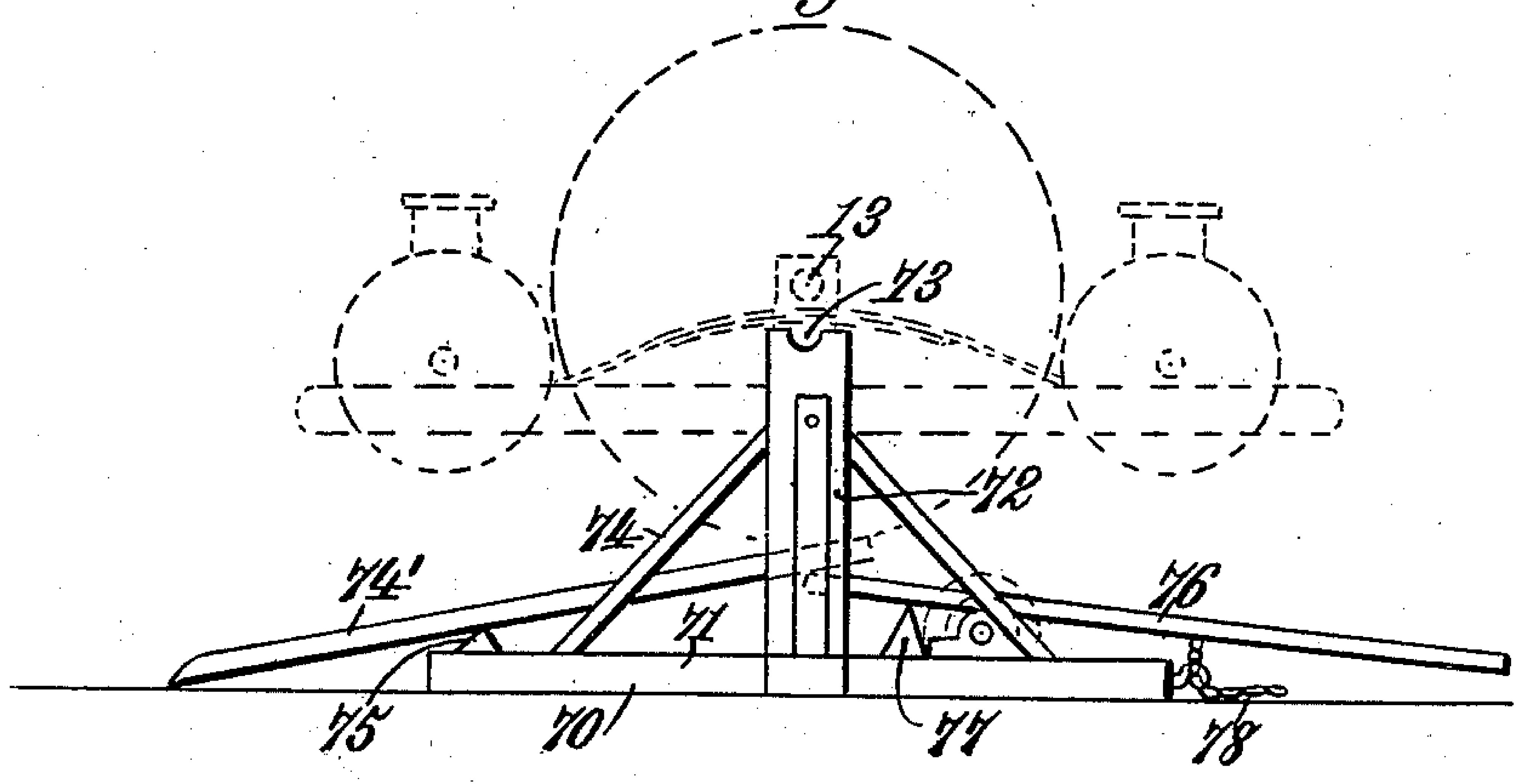
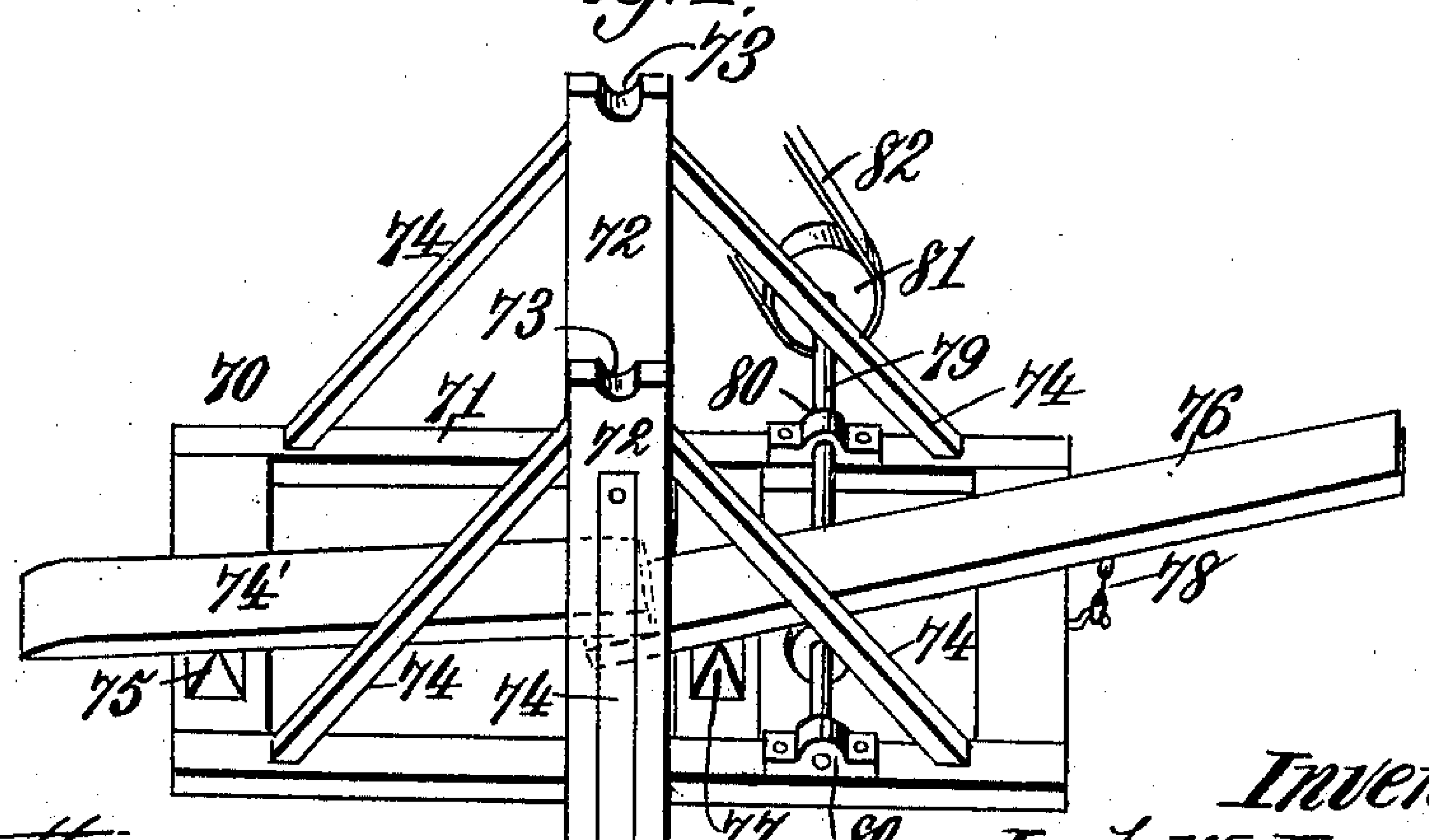


Fig. 4.



Witnesses.
Robert Everett,
Harry [illegible]

Inventor.
Jack W. James,
By James L. Norris.
Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JACK W. JAMES, OF MEMPHIS, TENNESSEE.

TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 676,257, dated June 11, 1901.

Application filed February 14, 1901. Serial No. 47,326. (No model.)

To all whom it may concern:

Be it known that I, JACK W. JAMES, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented new and useful Improvements in Traction-Engines, of which the following is a specification.

This invention relates to traction-engines, and my improved engine is of such a character that it may be employed for general purposes—such as drawing plows, road-scrapers, harvesting machinery, light or heavy wagons, &c.—or it can be advantageously used for operating a pump, sawing-machine, dynamo, grist-mill, &c., in which latter case it is held stationary through the intervention of a simple device, and while any agent may be utilized for securing the action of the working parts I prefer to employ a hydrocarbon—such, for example, as gasolene.

The improved machine is light, yet thoroughly strong and powerful, and is compact, this latter feature being one of the peculiar points of the invention, as the framing of the engine is hollow, it being used as a reservoir to receive the operating liquid, thereby rendering the presence of a tank or storage-chamber for this purpose unnecessary. Not only do I use the framing for a reservoir for the hydrocarbon, but I exhaust the spent gases from the engine-cylinder into the same, the exhaust being so distributed or divided that the noise usually attending this operation is largely removed.

In the accompanying description I will set forth at length the peculiar construction of the engine and the advantages thereof, and the novel features of the invention will be covered in the appended claims.

The invention is represented in one simple and convenient embodiment thereof in the accompanying drawings, wherein—

Figure 1 is a perspective view of the engine coupled to a disk plow. Fig. 2 is a substantially central horizontal sectional plan view. Fig. 3 is a similar view of the engine in its support, during which time it is held stationary for driving a mill or such device. Fig. 4 is a side elevation of said support.

Like characters refer to like parts in all the figures of the drawings.

In the form of engine illustrated it involves in its construction a comparatively large traction-wheel which may be of any suitable character. The wheel shown is denoted by 12, and in the present instance it is keyed to a shaft or axle, as 13. The wheel is generally made of metal and of a weight to conform to the nature of work to be accomplished. I prefer, however, to make the tire or tread wide and corrugate the same transversely thereof, this being a type well adapted for general purposes. The frame is denoted by 14, and it is yieldingly suspended from the axle. The frame represented consists of two substantially similar sections, as 15, of approximately U shape, the branches of said sections or members being united by couplings, as 16, in threaded engagement therewith, and said parts when united forming an elongated open structure, in which the traction-wheel 12 is located. The frame is hollow, it being preferably formed of piping of a suitable diameter. This piping is in the nature of a reservoir, as it is adapted to contain the gasolene or equivalent liquid for operating the engine, and it has at a suitable place a filling-opening, by which it may be supplied, the filling-opening in the present case being the bore of the nipple or nozzle 17, having a removable cap or screw-plug, as 18, which can be removed for charging the reservoir and which is normally so adjusted as to permit the entrance into the tubular frame of a small quantity of atmospheric air. The axle 13 has at its outer ends boxes, as 19, to which the strong leaf-springs 20 are firmly secured, and the axle is designed to rotate in these boxes. The springs are bowed, extending oppositely and downward from the bearing-boxes, one end of each being rigidly secured to the frame 14, while the opposite ends are movably connected to said frame. The opposite side members of the frame have at proper places boxes or blocks, as 21, preferably bolted thereto, and the rear ends of the springs 20 are rigidly secured to the rear and alined boxes 21, while the opposite ends of said springs are bent on themselves. This construction forms slots or openings at the forward ends of the springs, in which pins, as 22, are adapted to play, said pins being secured between lugs, as 23, on the forward boxes or brackets. This construc-

tion permits a certain and limited degree of movement of the springs in the direction of their length. Coiled springs, as 24, are secured to the under sides of the journal-boxes 19 and are attached at their lower ends to bands, as 25, clamped or otherwise secured to the frame, and said coiled springs serve to uphold the frame 14 should one or both of the leaf-springs break.

In Fig. 1 I have shown the frame as supporting a row of cylinders, as 27, at the rear end, though it may be provided with a similar row at its front end, said cylinders being sustained upon a transverse plate or plates, as 26. The crank-shafts connected with the pistons of the respective cylinders are each denoted by 27′, and those at opposite ends are alined and are adapted to be connected by clutches, as 28, whereby any number of cylinders may be operated. Referring to Fig. 2, it will be seen that the outermost crank-shafts are connected, sprocket-gearing constituting a convenient mechanism for this purpose, the shafts having sprocket-wheels, as 29, over which a sprocket-chain 30 is shown as passed. The axle has loosely mounted thereon a sprocket-wheel, as 31, and a band-wheel 32, the former being adapted to be driven by the sprocket-chain 30′ and the latter by the crossed band 34. The sprocket-chain and band are also placed upon sprocket and band wheels, as 29′ and 36, respectively, rigidly secured to the shafting of the rear series of cylinders 27. The inner surfaces of the hubs of the sprocket-wheel 31 and band-wheel are formed as clutch-halves, being adapted to be alternately engaged by the clutch member 38, slidable or keyed to the shaft or axle 13. The clutch member 38 consists of two substantially similar portions or disks 39 on opposite sides of the hub of the traction-wheel 12, united by pins, as 39, passing freely through openings or holes in said hub. By sliding the clutch member one way the sprocket-wheel 31 will be connected to the axle to propel the vehicle forward, and by moving the same in the opposite direction the band-wheel 32 will be connected to the axle, so that through the crossed band the vehicle can be driven backward.

The crank-shafting, constituting part of the engine proper, is equipped with one or more fly-wheels, as 40.

A pipe, as 41, is mounted on the frame, it being connected by tubing, as 42, with the tubular frame 14 and by tubing, as 43, with the cylinder 27, so that the latter can draw in their necessary supply of fuel, and the exhaust from the cylinders is discharged into tubes, as 44. The tubes 44 are connected to the pipe 45, extending horizontally across the machine and sustained by lugs on the rear boxes 21 and having a check-valve, as 45′.

Pipes, as 46, are connected to the horizontal pipe 45 and extend upward and forward therefrom and are connected to the pipe 47 near its opposite ends. The pipe 47 is passed through sleeves on the under side of the plate or bracket 48. A pipe 49, a duplicate of and parallel to pipe 47, is similarly passed through sleeves on the under side of said plate or bracket, and it has connected thereto, near its opposite ends, pipes, as 50, corresponding to the pipes 46 and extending downward and forward therefrom and connected to the transverse horizontal pipe 52, corresponding with the pipe 45. To the opposite ends of the pipes 47 and 49 the pipes 53 are connected and extend downward therefrom, and those on the respective ends cross each other, and they pass through holes or openings in the bands 54, secured to the framework, and terminate in T ends, as shown at 55. The several pipes just described not only serve to strongly brace the frame, but are adapted to receive the exhaust from the explosion-cylinders, the exhaust from the rear cylinder passing into the pipe 45, and when a second and front row of cylinders is used it escaping into the pipe 52, from which pipes the exhaust can pass into pipes 47 and 49 and 53 and thence to atmosphere through the T's 55, the arrangement of exhaust-pipe dividing the waste gases from the cylinders at different points in its traverse through the same, thereby materially deadening the noise.

The body portion 56 is slotted, as at 57, to receive the pivot-bolt 58 on the plate or bracket 48, and the arms 59 branch or diverge from said body portion, extending rearwardly and downwardly therefrom and having extensions, as 60, at their lower ends, bolted or otherwise secured to the axle 61, having wheels, as 62, at its opposite ends, said axle being longitudinally adjustable, as shown. A bowed or curved brace-bar, as 63, is secured to these extensions and aids in increasing the stability of the framework.

An extension, as 65, has a sleeve 66 on and rigidly secured to the frame 14 in some suitable manner, the extension projecting rearward, and it may be manipulated to swing the frame 14 and its traction-wheel 12 around for steering, said frame of course turning relatively to the body portion 56, the diverging arms 59 of which are rigidly connected to the axle 61. This extension 65 has an upright arm or lever 66′ connected thereto to facilitate guiding the vehicle, the upper end of which is in convenient reach of an operator occupying the seat 67, connected by arms 68 to the axle 61, and it is shown as having a backing-pin 69.

The rear axle may be provided with devices of a suitable nature, as shown, for uniting the traction-engine with different kinds of vehicles or farm machinery.

As thus far described the vehicle is arranged for drawing purposes. It may be used with decided advantage as a stationary engine, in this use it being operated in conjunction with the frame 70. Said frame 70 includes in its organization a base or bottom 71, from opposite sides of which the upright bearings or

standards 72 rise, the latter having substantially semicircular depressions or pockets 73 to receive the axle 13. The bearings or standards are held upright by diagonal braces, as 74, connected to the same and to the base.

In operation the wheel 12 is run up the incline 74′ a proper distance or until the axle is in vertical line with the depressions 73, at which time said axle can be lowered until its opposite projecting ends are seated in said depressions. The incline 74′ is in the nature of a lever sustained upon the fulcrum 75 and its inner end bearing against the inner end of the lever 76, supported by the fulcrum 77. The wheel is sustained upon the lever 76, and when it is desired to lift the wheel it is simply necessary to bear down on the outer end of said lever 76. The lever 76 can be connected with the framing by chain, as 78. A shaft, as 79, is rotatively supported by journal-boxes, as 80, on the base 71, and it may be connected by a pulley and belt 81 and 82 with a pulley on the axle or shaft 13. Said shaft in turn may have a pulley, as 83, from which its power can be taken.

A singletree is shown at 85, it being pivoted at its center to the transverse bar or brace 63, and yieldable tugs, as 86, are attached to the opposite ends of said singletree and the boxes 19.

All the drawing of the traction-engine is done through the singletree 85 and tugs 86, this being the only direct connection between the two parts of the vehicle. When backing, the pin 69 engages the curved bar 63.

Any convenient type of hydrocarbon-motor may be employed, and the invention may be modified within the scope of the following claims.

It will be understood that the opposite ends of the axle project outward from the boxes 19 of the framing, so that when the latter is being used as a stationary engine said extended ends will be supported properly by the frame 70.

When the engine is employed for drawing a wagon, the two rear wheels thereof are detached.

Having described the invention, what I claim is—

1. In a traction-engine, a hollow frame, a traction-wheel surrounded by the frame, the framing being hollow to contain a liquid, a plurality of cylinders on the frame, and means for conducting the liquid from the frame to the cylinder.

2. In a traction-engine, a hollow frame and a traction-wheel surrounded and supported by the frame, the frame being hollow to contain a liquid, a motor-cylinder on the frame, means for conducting the liquid from the frame to the cylinder, and tubular braces for the frame, connected with and adapted to receive the exhaust from said cylinder.

3. In a traction-engine, a tubular frame constituting a liquid-reservoir, a traction-wheel surrounded by the frame, a shaft for the wheel connected with the frame, a cylinder supported by said frame, and piping connecting the tubular frame and cylinder and serving to conduct liquid from the frame to the cylinder.

4. In a traction-engine, a frame consisting of two substantially similar U-shaped tubular sections and couplings in threaded engagement with the branches of said U-shaped sections and uniting the same to form an elongated open structure, a traction-wheel located in said frame, a shaft or axle for supporting the wheel, and yieldable connections between the shaft or axle and frame.

5. In a traction-engine, a frame consisting of two substantially similar U-shaped sections and couplings in threaded engagement with the branches of said U-shaped sections and serving to unite the same to form an elongated structure, a traction-wheel within said frame, and an axle for the wheel supported by said frame.

6. In a traction-engine, a frame consisting of two substantially similar U-shaped tubular sections and couplings in threaded engagement with the branches of said sections uniting the same to form an elongated structure, and the tubular frame constituting a fluid-reservoir, a traction-wheel in said frame and connected thereto, a motor-cylinder supported on the frame, and piping connecting the tubular frame and cylinder to conduct fluid from the former to the latter.

7. In a traction-engine, a frame consisting of two substantially similar U-shaped sections and couplings uniting said sections to form an elongated structure, an axle, boxes on the axle, leaf-springs connected at their middle to said boxes and at their ends to the frame, and coiled springs connected to said boxes and frame.

8. In a traction-engine, an elongated open frame, a wheel located in the frame, alined boxes secured to said frame at the front and rear thereof, an axle having boxes to receive the axle, leaf-springs rigidly secured to the boxes on the axle and to the rear boxes on the frame, and being bent on themselves on their forward ends to form openings, and pins on the forward blocks on the frame passing through said openings.

9. In a traction-engine, an elongated tubular frame constituting a fluid-reservoir, a traction-wheel located in and supported by said frame, a cylinder supported on the frame, piping connecting the tubular frame and cylinder to conduct fluid from the former to the latter, and exhaust-pipes constituting braces for the frame having T-shaped discharge ends.

10. In a traction-engine, an open tubular frame, a wheel supported in and by said frame, and the latter constituting a fluid-reservoir, a cylinder on the frame, a pipe to conduct fluid from the frame to the cylinder, an exhaust-pipe connected to said cylinder and two pipes connected to the opposite ends of said exhaust-pipe for dividing the exhaust.

11. In a traction-engine, an open tubular

frame, a wheel supported in and by said frame, and the latter constituting a fluid-reservoir, a cylinder on the frame, a pipe to conduct fluid from the frame to the cylinder, an exhaust-pipe connected to said cylinder, two pipes connected to the opposite ends of said exhaust-pipe for dividing the exhaust, and T-ended pipes connected respectively to said two pipes.

12. In a traction-engine, an elongated tubular frame, a plate or bracket located above said frame, parallel pipes secured to the under side of said plate or bracket, and a series of pipes diagonally disposed and connected to said parallel pipes near their opposite ends and extending respectively forwardly and rearwardly therefrom and connected to said frame.

13. In a traction-engine, an elongated tubular frame, a plate or bracket located above said frame, parallel pipes secured to the under side of said plate or bracket, a series of pipes diagonally disposed and connected to said parallel pipes near their opposite ends and extending respectively forwardly and rearwardly therefrom and connected to said frame and T-ended pipes connected to and depending from the ends of said parallel pipes.

14. In a traction-engine, an elongated tubular frame, a plate or bracket located above said frame, parallel pipes secured to the under side of said plate or bracket, a series of pipes diagonally disposed and connected to said parallel pipes near their opposite ends and extending respectively forwardly and rearwardly therefrom and connected to said frame, a body portion pivoted to said plate or bracket, having diverging arms, and an axle rigidly connected to said diverging arms.

15. In a traction-engine, an elongated tubular frame, a plate or bracket located above said frame, parallel pipes secured to the under side of said plate or bracket, a series of pipes diagonally disposed and connected to said parallel pipes near their opposite ends and extending respectively forwardly and rearwardly therefrom, and connected to said frame, a body portion pivoted to said plate or bracket having diverging arms, an axle rigidly connected to said diverging arms, a cross-bar uniting said arms, and an extension on the frame provided with an actuating member.

16. In a traction-engine, an elongated tubular frame, a plate or bracket located above said frame, parallel pipes secured to the under side of said plate or bracket, a series of pipes diagonally disposed and connected to said parallel pipes near their opposite ends and extending respectively forwardly and rearwardly therefrom, and connected to said frame, a body portion pivoted to said plate or bracket, having diverging arms, an axle rigidly connected to said diverging arms, a cross-bar uniting said arms, an extension on the frame provided with an actuating member, a singletree pivoted on said extension, a wheel located in said frame, an axle for the wheel, boxes to receive said axle and yieldingly connected with the frame, and yieldable connections between said singletree and boxes.

17. In a traction-engine, a frame, a single traction-wheel inside the frame, a shaft on the frame carrying said traction-wheel, and its ends being extended beyond said frame, detachably-mounted wheels at the rear of said frame, a base having standards to support the extended ends of said shaft, and two levers on the base one bearing against the other and being adapted to support said traction-wheel.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JACK W. JAMES.

Witnesses:
G. J. McSPADDEN,
A. P. WARTERFIELD.