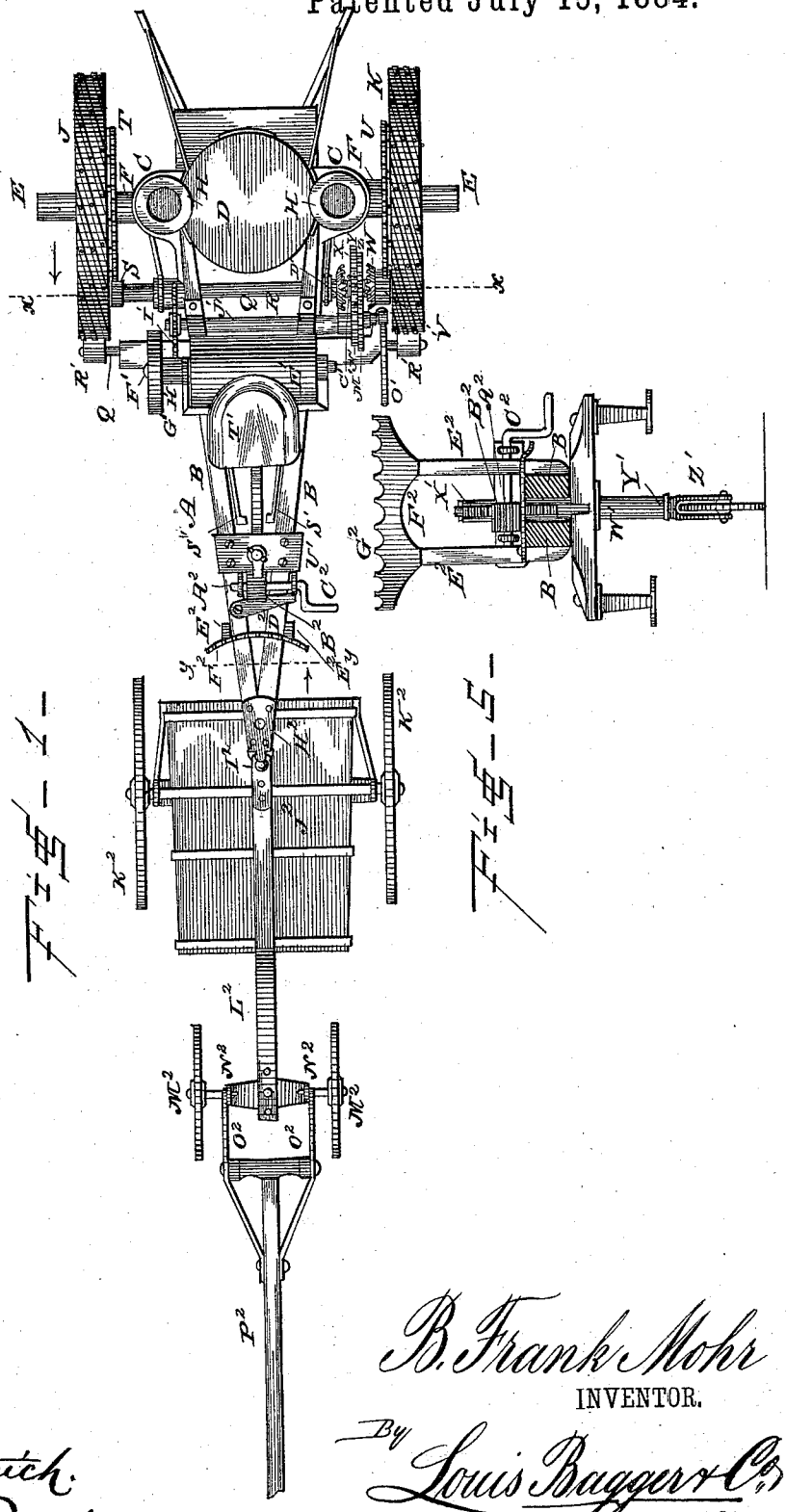
(No Model.) 3 Sheets—Sheet 1.

B. F. MOHR.

TRACTION ENGINE.

No. 302,153. Patented July 15, 1884.



WITNESSES:

Fred. G. Dieterich.

Arthur L. Morsell.

B. Frank Mohr

INVENTOR.

By Louis Bagger & Co.

ATTORNEYS.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 3 Sheets—Sheet 2.

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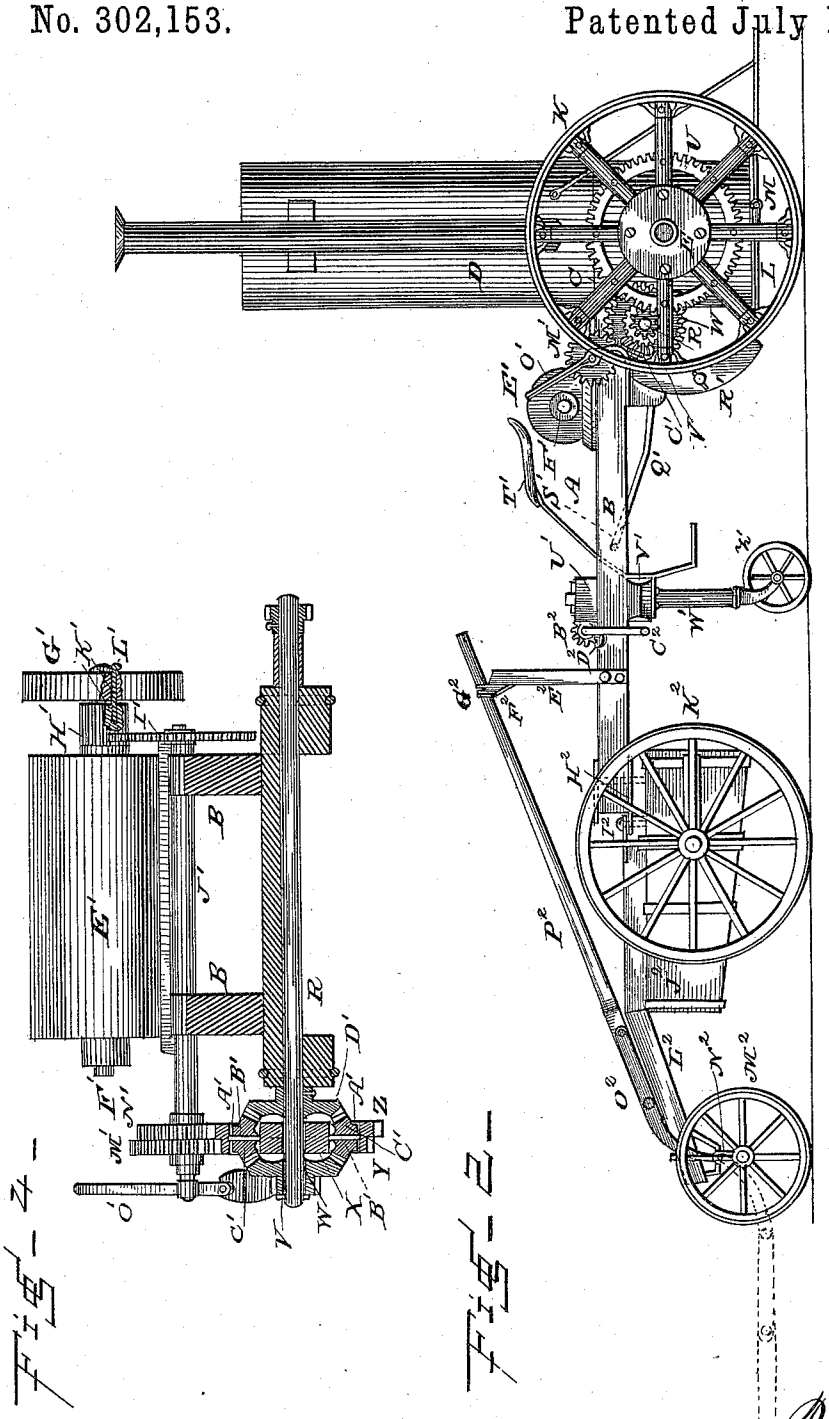


Fig. 2.

Fig. 1.

WITNESSES:

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Arthur L. Morsell.

B. F. Mohr
INVENTOR.

By Louis Bagger & Co
ATTORNEYS.

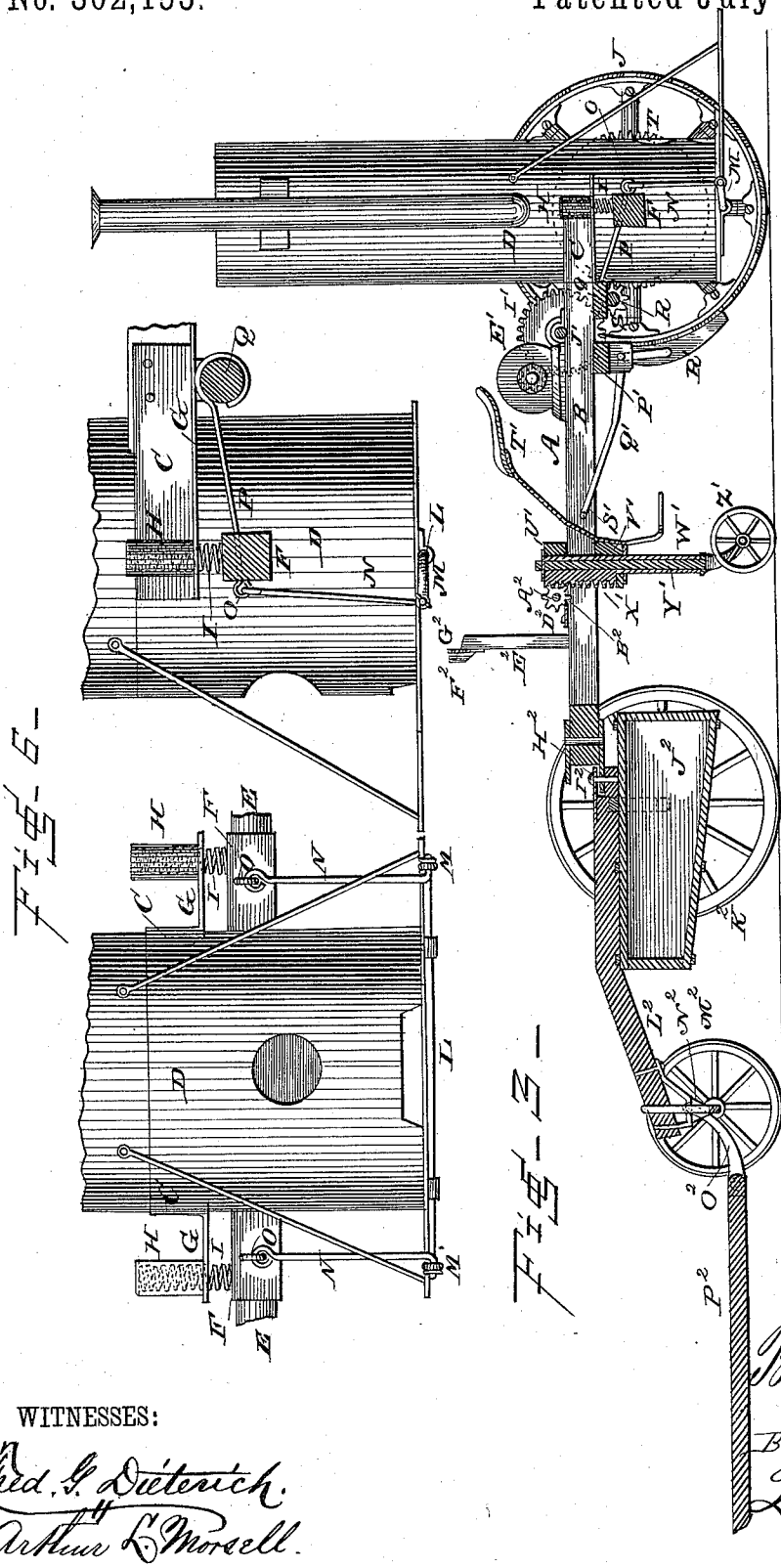
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UNITED STATES PATENT OFFICE.

B. FRANK MOHR, OF MIFFLINBURG, PENNSYLVANIA.

TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 302,153, dated July 15, 1884.

Application filed April 4, 1884. (No model.)

To all whom it may concern:

Be it known that I, B. FRANK MOHR, a citizen of the United States, and a resident of Mifflinburg, in the county of Union and State of Pennsylvania, have invented certain new and useful Improvements in Traction-Engines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying three sheets of drawings, which form a part of this specification, and in which—

Figure 1 is a plan view of my improved traction-engine. Fig. 2 is a side view of the same. Fig. 3 is a longitudinal sectional view, the boiler being shown in elevation. Fig. 4 is a transverse sectional view taken on the line *x x*, in Fig. 1. Fig. 5 is a transverse sectional view taken on the line *y y* in Fig. 1; and Fig. 6 is a detail view illustrating the method of supporting the boiler upon the axle.

The same letters refer to the same parts in all the figures.

This invention relates to that class of traction-engines which may be used for transporting loaded wagons, agricultural machinery, and the like over roads, and which, when the point of destination has been reached, may be "set up" and used as stationary engines for the operation of such agricultural machines as thrashing-machines and the like, or for running saws or other machinery of any kind or description.

My invention has for its object to produce a machine which shall possess superior advantages in point of simplicity, durability, and general efficiency, and in which the prominent features may be stated to be, first, an improved method of hanging the boiler upon, or connecting it to, the main axle, whereby it shall be self-leveling in going over rough or uneven roads; second, an improved compensating-gear for conveying the motion from the engine to the drive-wheels; third, a separate and detachable water-tank, and the method of connecting the same to the front end of the engine proper; and, fourth, the improved steering-gear.

My invention further consists in the improved construction and arrangement of details, which will be hereinafter fully described, and particularly pointed out in the claims.

Referring to the drawings hereto annexed, A designates the frame of the engine, which consists mainly of two beams, B B, converging at their front ends and provided at their rear ends with plates or castings C C, between which the boiler D is rigidly secured. The boiler may be of the vertical cylindrical pattern; but as it will be made the subject of a separate application for Letters Patent, no detailed description thereof need be given in the present application.

E is the main axle, which extends transversely through the fire-box of the boiler, and is provided, adjoining the same, with boxes F F. The plates or castings C C are provided with laterally-extending flanges G G, (see Fig. 6,) constructed with cylindrical housings H H, containing strong coiled springs I, that rest upon the boxes F of the axle. The latter is mounted upon the drive-wheels J and K, both of which are mounted loosely upon the said axle. These wheels embody in their construction certain improved tire-tightening devices, which, as well as a clutch mechanism, to be hereinafter referred to, will be made the subject of separate applications for Letters Patent, and consequently need no detailed description herein.

Mounted transversely in suitable hangers under the boiler is a rock-shaft, L, the ends of which are provided with rearward-extending cranks M M, connected by links N N with loops or eyes O O formed upon the rear ends of a pair of horizontal rods, P P, extending through the upper parts of the boxes F, at the sides of the boiler, and having their front ends twisted around and connected to a transverse bar, Q, secured under the frame-beams B some distance in front of the axle. It will be seen that by this construction the weight of the boiler is supported upon the springs I, its vertical motion, when any such motion takes place, being guided by the rocking crank-shaft L and the links N, which serve to steady the motion, while the rods P serve to hold the cross-bar Q at all times at an even distance from the axle. It follows that in passing over rough roads jolting is avoided, the boil-

er is caused to be self righting or leveling, and the gearing attached to the axle and to the transverse bar Q is kept always in mesh. Moreover, by the arrangement described, the weight of the boiler is supported almost wholly upon the main axle, thereby causing the greatest possible amount of friction upon the drive-wheels, and rendering the draft certain and as easy as possible.

Mounted longitudinally in or under the transverse bar Q is a shaft, R, one end of which has a fixed pinion, S, meshing with a spur-wheel, T, upon the inside of the drive-wheel J. The inside of the drive-wheel K is likewise provided with a spur-wheel, U, meshing with a pinion, V. The latter is cast upon or rigidly attached to a bevel-wheel, W, mounted loosely upon the shaft R.

X is a disk or casting comprising two spur-wheels, Y and Z, of unequal diameters, the latter being somewhat larger than the former, Figs. 1 and 4. This disk, which is mounted loosely upon the shaft R, adjoining the bevel-wheel W, is provided with two or more radial slots, A′, in which, upon radial pins B′, are mounted bevel-pinions C′, engaging the loose bevel-wheel W, and another bevel-wheel, D′, secured rigidly upon the shaft R, at the other side of the disk or casting X.

E′ is the engine, which is mounted upon the frame-beams B B, some distance in front of the main axle. In the drawings hereto annexed I have shown an ordinary rotary engine; but I would have it understood that I do not wish to limit myself to this or to any particular kind of engine, as almost any kind or pattern may be successfully used in connection with my invention. The main shaft F′ of the engine is provided with a band-wheel, G′, at the inside of which it is provided with a loose pinion, H′, meshing with a spur-wheel, I′, mounted upon a shaft, J′, journaled transversely upon the frame-beams B B, in rear of the engine. The wheel G′ and pinion H′ are provided each with a transverse perforation, K′, which may be made to register, thus enabling a key, L′, to be inserted, which serves the purpose of locking the pinion H′ upon the shaft. It is evident that when the pinion is thus locked upon the shaft, it will transmit the motion from the latter to the spur-wheel I′ of shaft J′, and thence, as will be presently described, to the drive-wheels of the engine. When, on the other hand, it is desired to use the device as a stationary engine, it is only necessary to remove the pin or key L′. The connection with the drive-wheels is thus ungeared, and motion may be conveyed from the drum or band-wheel G′ by means of an ordinary belt or band to the machinery to be driven. The end of the shaft J′ opposite to that bearing the spur-wheel I′ has a pair of loosely-mounted pinions, M′ and N′, meshing, respectively, with the spur-wheels Y and Z of the disk or casting X, which, as stated, is mounted loosely upon the shaft R. The inner adjoining sides of these pinions are recessed, and they inclose a clutch mechanism attached to the shaft J′, (but not shown in detail in the drawings,) and operated by a hand-lever, O′, whereby either of the said pinions may be connected rigidly with the shaft J′, or both may, when desired, be disconnected from the same. Any suitable clutch mechanism by which this result may be effected may be used for this purpose; but the particular mechanism which I prefer to use will, as heretofore stated, be made the subject of a separate application for a patent.

P′, Fig. 3, is a bar secured transversely under the frame-beams B B in front of the wheels, and under the said bar are journaled a pair of separate brake-levers, Q′ Q′, the cranks of which carry the brake-shoes R′, which are of ordinary construction. The inner ends of the brake-shafts are provided with forwardly-extending foot-levers S′, which may be easily manipulated by the driver, whose seat T′ is secured to a suitable cross-bar, V′. The cross-bar V′ and a similar bar, U′, located above the same, are provided with bearings for a vertically-sliding tube, W′, upon the front side of which is cast or formed a rack, X′. (See Figs. 3 and 5.) Journaled in the said tube is a vertical rod or shaft, Y′, carrying at its lower end a roller or caster, Z′.

Journaled transversely in front of the cross-bar U′ is a shaft, A^2, having a pinion, B^2, engaging the rack X′, and provided with a crank, C^2, by means of which it may be conveniently operated, thereby adjusting the caster to any desired elevation, at which it may be retained by means of a latch, D^2, pivoted to one of the frame-bars and engaging the pinion.

E^2 E^2 are a pair of uprights secured to the frame-bars in front of the cross-bar U′, and connected at their upper ends by a curved bar or plate, F^2, the upper edge of which is provided with a series of notches, G^2, the purpose of which will be hereinafter fully described.

The converging front ends of the frame-beams B B are provided with a perforated plate, H^2, whereby the engine-frame may be connected by means of an ordinary coupling-pin, I^2, with the water-tank J^2. The latter consists of a box-shaped or other suitably constructed tank mounted upon a pair of large wheels, K^2, which support the principal weight of the said tank.

L^2 is a reach-bar secured to the upper side of the tank, and extending in a forward and downward direction, and having at its front end swiveled thereto an axle carrying a pair of small wheels, M^2, of such size that they will readily swing under the reach-bar when turns are to be made. The axle is provided with a pair of upward-extending lugs, N^2, to which the hounds O^2 of the tongue P^2 are pivoted. Said hounds are curved, as shown, in such a manner that when it becomes desirable or necessary the said tongue P^2 may be swung back over the water-tank, as shown in Fig. 2

of the drawings, and rested in any one of the notches G^2 of the plate F^2. In this manner the front wheels of the water-tank may be placed and retained at any desired angle, and thus serve to steer the engine when the water-tank is attached thereto. On the other hand it is obvious that when the water-tank is detached from the engine the tongue may be thrown forward and draft attached thereto in the usual manner.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of my invention will be readily understood by those skilled in the art to which it appertains.

The advantages of the improved method of hanging or mounting the boiler have been already described. When the engine is to travel upon the road the water-tank is coupled to the front end of the frame in the manner described, and the tongue is thrown back, so as to serve for the purpose of steering the engine, its rear end being within convenient reach of the driver, who may easily adjust it in the proper notch of the plate F^2. Motion is communicated from the engine-shaft F′ to the shaft J′. The latter may be connected by the clutch-mechanism, to which reference has been made, with either one of the pinions M′ or N′, according to whether great speed or power is desired, this being of course governed partly by the weight of the load to be drawn, and partly by the nature of the roads to be traversed. If a stop is to be made the pinions M′ and N′ may be both disconnected from the shaft. The motion is communicated from the pinion M′ or N′ as the case may be, to the toothed disk X, and thence through the bevel-wheels and pinions to the pinions meshing with the spur-wheels of the drivers, which are thus caused to revolve and propel the engine over the ground. In case of turning corners the described arrangement of the disk X with its bevel-pinions and the adjoining bevel-wheels forms a compensating-gear, which will permit one of the wheels which has the greatest distance to traverse to move or revolve faster than the other. In like manner it becomes possible, when short or sharp corners are to be turned, to apply the brake to one of the wheels which it is desired to check, thus enabling the engine to be turned very suddenly and sharply without danger of crowding or pushing against the water-tank. In passing over the road the caster-wheel at the front end of the engine-frame is to be kept raised or elevated, so as not to interfere with the progress of the device. When the point of destination has been reached the said caster-wheel is lowered, so as to support the front end of the engine-frame. The water-tank is then detached and moved to any desired position, the pin or key which secured the pinion upon the main engine-shaft is removed, and the engine is then ready for work as a stationary engine.

An important advantage of having the water-tank arranged in front instead of in rear of the engine is this, that in passing over the road it will, as it were, hold back against the action of the drive-wheels, thus increasing the friction of the latter, and causing them to take or bite more firmly upon the ground, thus assisting the progress of the engine. The water-tank, being detachable, may be sent for a fresh supply of water, whenever necessary, without necessitating the removal of the engine.

For short distances the engine may, when steam is up, be moved independently of the water-tank, its front end being supported upon the caster-wheel.

When the use of the engine in any one place has been completed, it is again connected with the water-tank, and may then be employed, as before, as a traction-engine.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a traction-engine, the combination of the frame, consisting, essentially, of two converging beams, plates or castings at the rear ends of said beams, provided with laterally-extending flanges having cylindrical housings, the boiler secured rigidly between the said plates or castings, the axle passing transversely through the fire-box of the boiler, and having blocks or boxes adjoining the latter, and the coiled springs resting upon said blocks and incased in the cylindrical housings, substantially as and for the purpose shown and specified.

2. In a traction-engine, the combination of the frame, consisting, essentially, of two converging beams, the boiler secured rigidly between plates or castings at the rear ends of the latter, the axle passing transversely through the fire-box of the boiler and having blocks or boxes adjoining the latter, a rock-shaft journaled transversely under the boiler and having rearward-extending cranks, links connecting the said cranks with the boxes upon the axle, and coiled springs resting upon the latter and incased in cylindrical housings formed in flanges extending laterally from the plates or castings at the rear ends of the frame-beams, substantially as and for the purpose set forth.

3. In a traction-engine, the combination of the frame, consisting, essentially, of two converging beams, plates or castings at the rear ends of the latter, the boiler secured rigidly between the said castings, the axle extending transversely through the fire-box of the boiler, and having blocks or boxes adjoining the latter, springs resting upon said boxes, and incased in cylindrical housings formed in flanges extending laterally from the castings at the rear end of the frame-beams, a counter-shaft extending through or under a transverse bar in front of the boiler under the frame-beams, rods encircling or twisted around said frame-bar, and extending rearward through the boxes upon the axle, pivoted rods connecting the rear ends of said horizontal rods with cranks upon

the ends of a rock-shaft journaled transversely under the boiler, pinions upon the counter-shaft meshing with spur-wheels upon the drive-wheels mounted upon the axle, and mechanism conveying motion from the engine to the counter-shaft, substantially as and for the purpose set forth.

4. In a traction-engine, the combination of the frame, the axle, drive-wheels mounted loosely upon the latter, mechanism, substantially as described, for imparting motion from the engine to the drive-wheels, whereby the latter may revolve independently of each other, and a pair of separate brakes—one for each drive-wheel—substantially as and for the purpose herein shown and specified.

5. The combination of the frame, the axle, the drive and supporting wheels, cross-bars near the front end of the frame, a tube sliding vertically in the said cross-bars and having a rack formed thereupon, a crank-shaft having a pinion engaging the said rack, a latch adapted to engage the said pinion, and a shank journaled in the vertical tube and having a caster-wheel at its lower end, substantially as and for the purpose set forth.

6. The combination, with a traction-engine, of the herein-described detachable water-tank mounted upon a pair of large wheels, and having a forward and downward extending reach-bar, a pair of small wheels mounted upon an axle pivoted under the front end of said reach-bar in such manner that said wheels may swing under the latter, and a tongue connected to said front axle by a pair of curved hounds, whereby the said tongue may be swung back over the water-tank, substantially as set forth.

7. In a traction-engine, the combination of the engine-frame, consisting, essentially, of two converging frame-beams, and provided near its front end with a pair of uprights connected at their upper ends by a plate having a series of notches in its upper edge, the water-tank connected detachably to the front end of the engine-frame, and having the steering-wheels, and the tongue connected to its front axle by curved hounds, whereby the said tongue may be thrown back and adjusted in any one of the notches of the aforesaid plate, substantially as and for the purpose herein shown and specified.

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

B. FRANK MOHR.

Witnesses:
AUGUST PETERSON,
LOUIS BAGGER.