

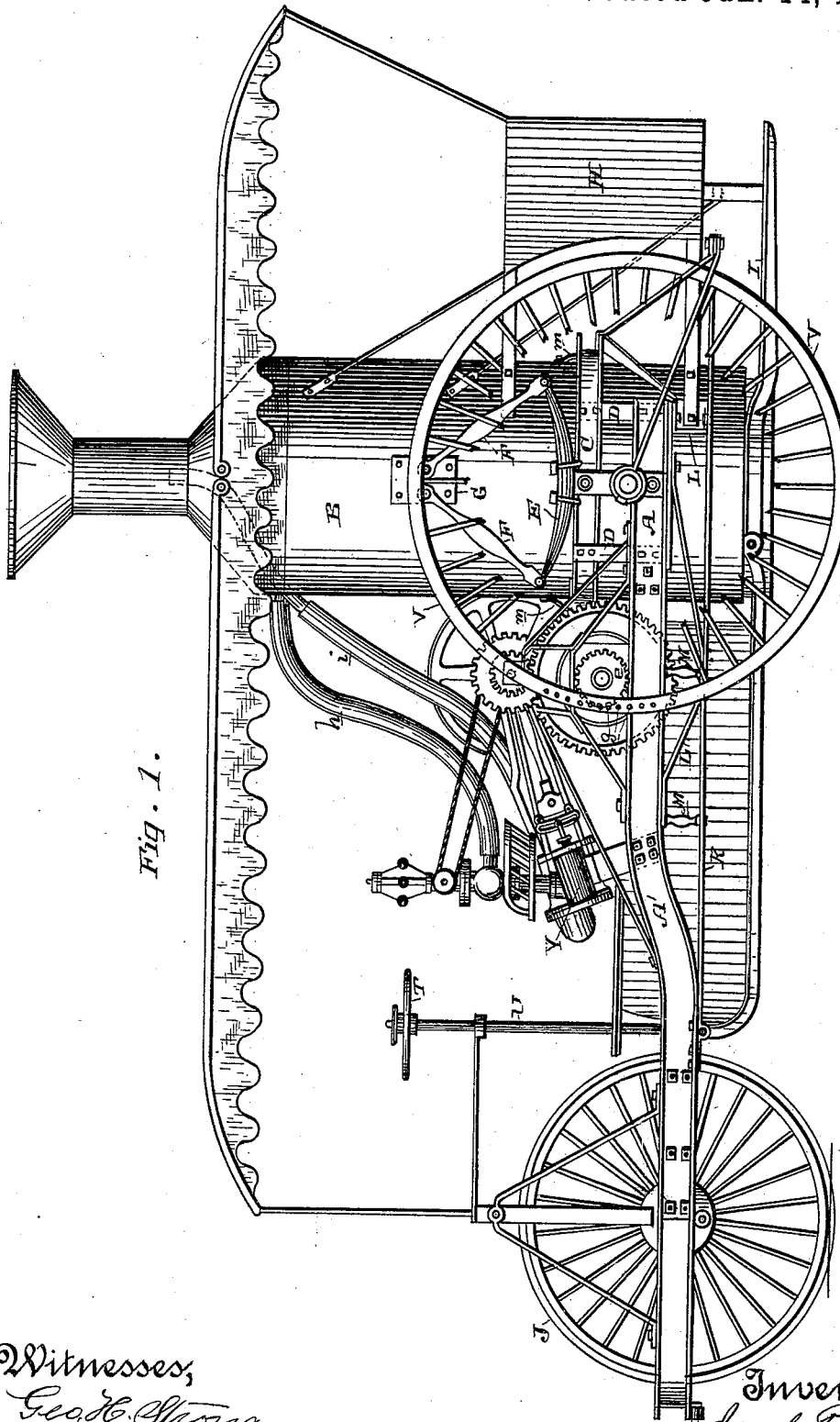
(No Model.)

4 Sheets—Sheet 1.

J. PRICE.  
TRACTION ENGINE.

No. 419,284.

Patented Jan. 14, 1890.



Witnesses,  
G. B. Strong,  
J. H. House

Inventor,  
Jacob Price  
By Dewey & Co. atts

(No Model.)

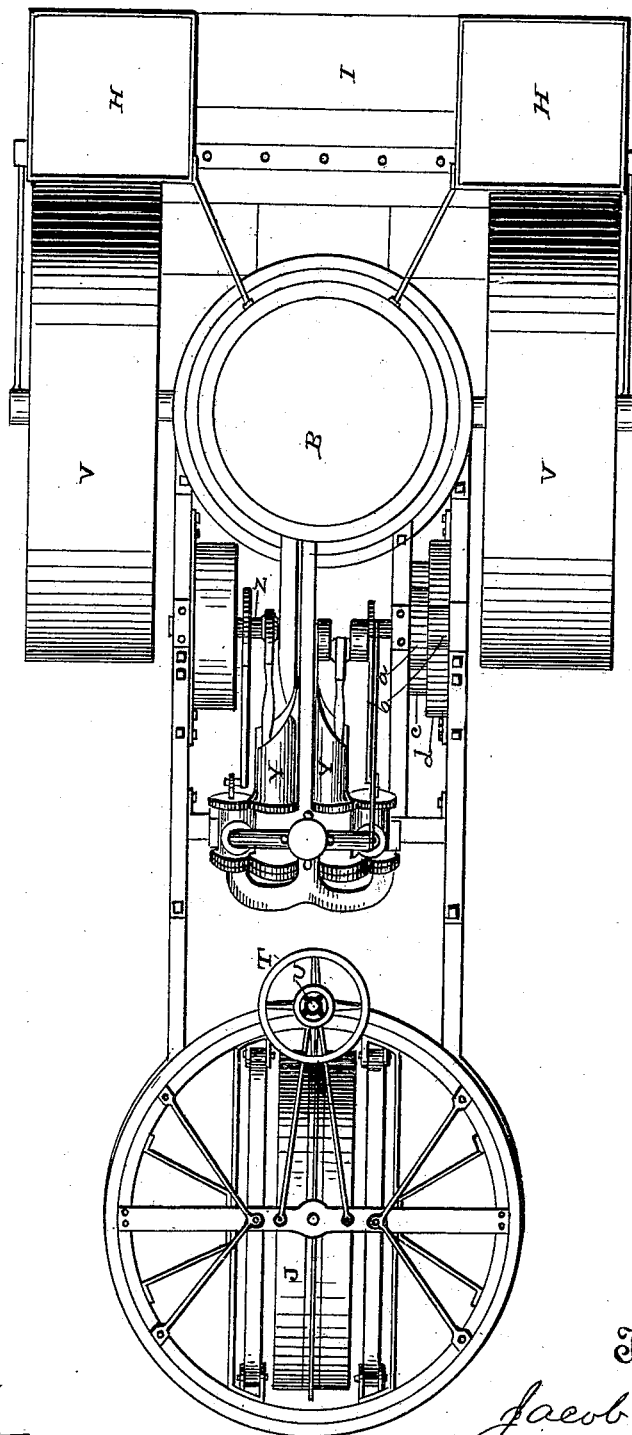
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Fig. 2.



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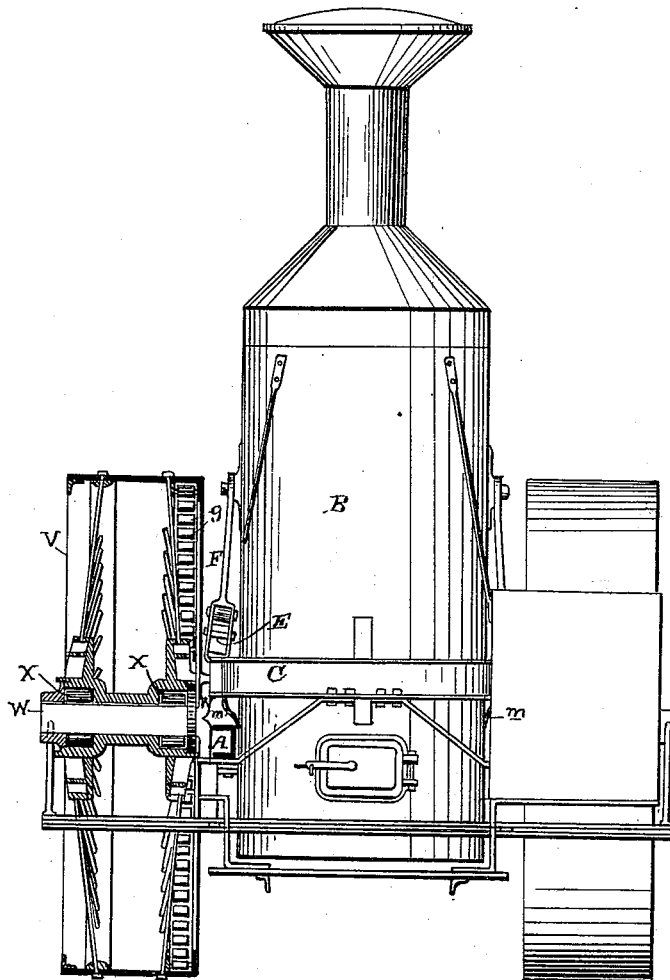
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*Fig. 3.*



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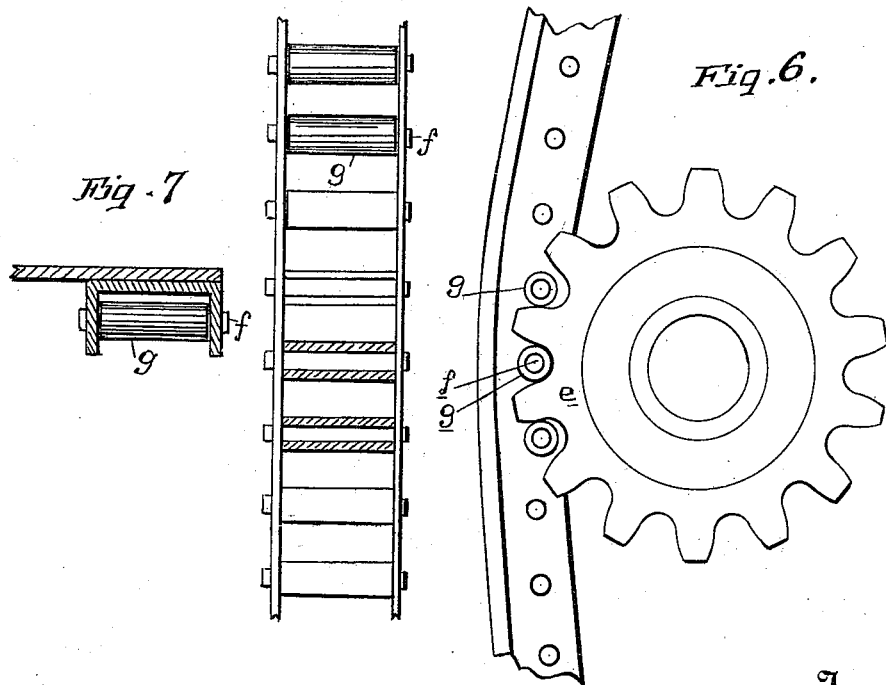
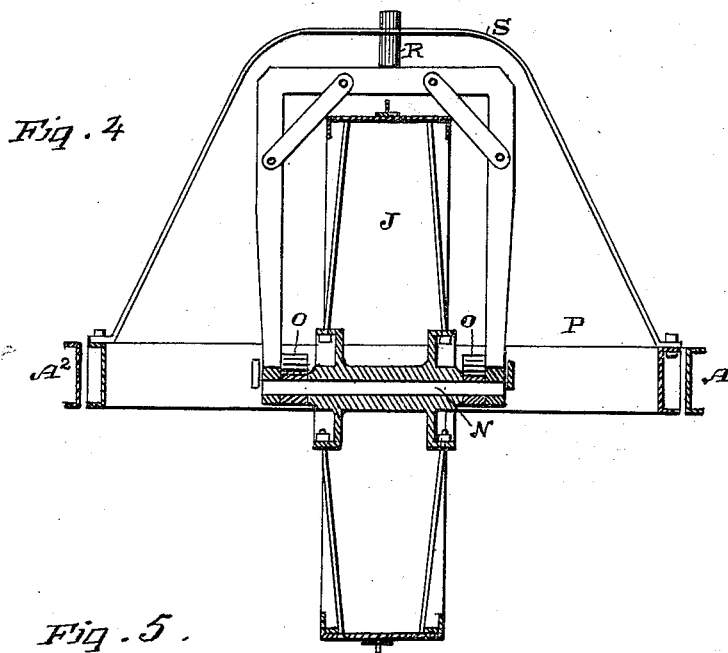
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4 Sheets—Sheet 4.

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# UNITED STATES PATENT OFFICE.

JACOB PRICE, OF SAN LEANDRO, CALIFORNIA.

## TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 419,284, dated January 14, 1890.

Application filed September 10, 1889. Serial No. 323,581. (No model.)

*To all whom it may concern:*

Be it known that I, JACOB PRICE, of San Leandro, Alameda county, State of California, have invented an Improvement in Traction-Engines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to certain improvements in traction-engines.

It consists in certain details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a side elevation, showing the hub and spokes of the nearest wheel broken away. Fig. 2 is a plan view. Fig. 3 is a rear view with a vertical section of one of the wheels. Fig. 4 is a vertical section taken in the plane of the axle of the steering-wheel. Figs. 5, 6, and 7 are details to be referred to.

A is the frame, which is made of metal, the side bars being curved inwardly at their rear ends, so as to partially surround the sides of the vertical boiler B, which is set between these frames. This boiler is surrounded by a ring C, which is formed of metal, preferably flanged or channel steel, and this ring is connected with the frame-work by the vertical straps or supports D, the curvature of the frame-work allowing these straps to be attached to it at points sufficiently far apart to support the ring with the necessary rigidity. Upon the top of this ring, at each side of the boiler, is fixed a heavy spring E, preferably of a leaf form, such as are employed upon locomotives and other heavy work. The central portion of this spring is properly clamped to the ring, and from the ends two rods F extend upward, approaching each other, and they are united to plates G, fixed upon the side of the boiler. The boiler is thus supported upon these springs, one upon each side, and has a movement up and down within the ring C, the elasticity of the springs E relieving the frame of its direct weight and allowing it to move and accommodate itself to irregularities of the surface over which the engine is passing. Guides *m m* are fixed so as to guide the boiler in its vertical movements and hold it in proper position with relation to the ring. The fuel-box H, the fireman's platform I, and the canopy or covering,

if such is used, may all be supported from the boiler, and all partake of its motion.

The frame-work A is curved downward toward the front, as shown at A', so as to bring the forward portion upon the proper level to receive the steering-wheel J, which is journaled within a fifth-wheel or ring, so as to be turned from side to side to steer the machine.

What I term the "draft-bars" K extend from the lower front portion of the sides A, parallel with the rear portion of the frame A and at some distance below its level, as shown. These frames or bars K are suitably united with or braced from the frame A by braces L and posts M, as shown, and they serve for the attachment of any load which is to be drawn by the engine.

The shaft N of the steering-wheel J turns in journal-boxes which rest against the springs O, these springs extending fore and aft upon each side of the wheel J, and having their ends connected with the fifth or turning wheel P, which turns within the exterior front portion of the frame A, and thus directs the steering-wheel J from side to side. In order to allow the wheel J to rise and fall and prevent its being thrown out of place, I have shown a yoke or frame Q, extending upward from each end of the wheel-shaft N. This regulating-yoke has a vertical shaft or post R, which passes through the stout strap S, and is thus guided so as to move vertically and prevent the wheel from tipping from side to side. The strap S forms an arch over the steering-gear, and the ends are securely bolted to the fifth-wheel or ring P, so as to turn with it. By this construction I insure a vertical movement of the wheel J on the springs O and guide-stem R. The horizontal ring or fifth-wheel within which the wheel J is journaled, is suitably retained and guided within the correspondingly-shaped exterior ring, which is secured to and forms the front portion of the frame, and it is turned from side to side by means of a hand-wheel T upon the shaft U, having a pinion at the lower end which engages a curved rack fixed around the upper portion of the ring P.

The bearing-wheels V are journaled upon axles W, the inner ends of which are split and turned upward and downward, as shown

at  $W'$ , and are strongly bolted to the ring C and the frame A, as is plainly shown in Fig. 3. Any suitable form of bearing may be made for the wheels. In the present case I have shown roller-bearings, as at X, Fig. 3, to relieve as much as possible the friction upon the axle. The engine may be made of any suitable or well-known form. In the present case I have shown a double-cylinder engine Y, connected with the cranks upon a shaft Z. This shaft carries the pinions  $a$  and  $b$ , which mesh with gear-wheels  $c$  and  $d$  of correspondingly different sizes, and by means of any suitable or well-known clutch mechanism (not here shown) either set of gears may be engaged, so as to drive the pinions  $e$  at a greater or less speed, as may be desired. The pinions  $e$  engage the teeth of the gears which are fixed around the inner circumference of the main bearing-wheels V. In the present case I have shown these teeth in the form of sleeves, which turn upon pins  $f$ , passing through the sides of the channel-iron sections  $X'$ , these latter being bolted to the inside of the wheel-rims, as shown, and the sleeves turning loosely upon the pins  $f$  relieve the friction caused by the contact with the driving-pinions.

The engine, engine-shafts, gearing, and rear bearing-wheels are all rigidly supported from the frame-work of the machine, while the boiler, water-tank, fuel-box, fireman's and engineer's platforms, canopy, and all parts which it is possible to support separately from the frame are supported upon the springs previously described.

The steam and exhaust pipes  $h$  and  $i$ , leading from the boiler to the engine, are made flexible or telescopic, so as to allow the boiler to have free movement upon its springs while maintaining a perfect connection with the engine.

By this construction those parts of the engine gearing and wheels which it is necessary to keep together are mounted upon the rigid frame A, and are not subject to any change with relation to each other, while a great portion of the heavier parts—such as the boiler, fuel, and water-tanks, &c.—are mounted upon springs, and are thus correspondingly relieved from the jolts which would be due to those heavy weights if carried upon a rigid frame.

In my present drawings I have only shown the outlines of the main and essential portions of the engine, leaving out gages and the small details which are necessary to the operation of such a machine, but which have no bearing upon the present invention.

The water-tank  $m'$  is suspended from the boiler and from the front part of the main frame by means of bars  $n$ , having the ends pivoted, respectively, to the boiler and to the frame, so that the tank partakes of the independent movements of the boiler. It is also easily removable by taking out the pivot-bolts.

Having thus described my invention, what I

claim as new, and desire to secure by Letters Patent, is—

1. In a traction-engine having a metal frame, with the main bearing and driving wheel axles fixed near to its rear end, a steering device comprising a central carrying-wheel supported in a horizontally-rotating ring moving in a fixed outer ring, in combination with the main side bars of the frame, so bent or curved that their rear part shall be nearly in the same plane as the carrying-wheel axles and their front ends shall lie in a plane as low as the fixed outer ring and support it, substantially as and for the purpose explained.

2. In a traction-engine, the frame made of metal and having the main driving and bearing wheel axles fixed near its rear end and a steering-wheel supporting the front end, said frame being bent or curved so that the front portion lies in a lower horizontal plane than the rear portion, in combination with the horizontal draft-bars K, extending rearwardly from the front portion of the frame, and braces extending between these bars and the rear portion of the frame which lies above them, substantially as described.

3. In a traction-engine, the metal frame, the vertical boiler suspended between the sides of said frame, a ring of larger diameter than said boiler surrounding it and having the supports and brace-rods connecting it with the frame, and springs fixed to said ring and having the boiler supported upon said springs, so that it may have a vertical movement within the supporting-ring and independent of the frame, substantially as described.

4. The boiler supported upon the springs within the rigidly-fixed ring and frame, as shown, in combination with the vertical guides  $m m$ , substantially as described.

5. In a traction-engine, a frame, a ring with springs attached to it fixed to a support upon said frame, a boiler of smaller diameter within said ring, springs fixed to said ring, and connecting rods or links extending from the springs to the boiler, whereby the latter is supported upon the springs and allowed a movement independent of the frame or gearing, substantially as described.

6. In a traction-engine, the rigid frame, the rear bearing-wheels having the axles or shafts fixed to said frame, and the engine and intermediate gearing supported rigidly upon the same frame, in combination with a boiler suspended from springs which are mounted upon said frame and so as to have a movement independent of that of the engine and frame, substantially as described.

7. In a traction-engine, the frame having the bearing-wheels, the engine, and the intermediate gearing fixed rigidly thereto, a boiler suspended by means of a supporting ring and springs and guided within the ring, as shown, so as to move independently of the other parts of the engine, and the flexible or telescopic steam and exhaust pipes, whereby

connection is made between the boiler and the engine, substantially as described.

8. In a traction-engine, the frame having the engine and gear wheels mounted rigidly thereon, and the bearing or driving wheels having independent axles upon which they turn, said axles having the oppositely-projecting forks or ends bolted to the frame and to the ring within which the boiler is supported, substantially as described.

9. In a traction-engine, the front or steering wheel within a horizontally-rotating ring, having springs attached to the inside of said horizontal ring and extending from front to rear parallel with the sides of the wheel, and journal-boxes within which the shaft of said wheel turns, said boxes being supported upon the springs, substantially as described.

10. In a traction-engine, a steering-wheel journaled within a horizontally-rotating ring and having its journal-boxes mounted upon springs which are secured to the inner surface of said ring, in combination with a vertical yoke the ends of which are connected with the wheel-shaft, a shaft or spindle ex-

tending upwardly from the upper part of the yoke, and a guide through which said spindle moves, substantially as described.

11. In a traction-engine, the main frame, the engine, gearing, and bearing-wheels arranged with relation to each other as described, in combination with the channel-iron rings fixed within the periphery of the main wheel-rims, the rollers journaled within said segments and forming gear-teeth, and the pinions upon shafts journaled rigidly upon the main frame, so that the pinion-teeth engage the roller or movable teeth of the wheels, substantially as described.

12. The water-tank having its rear end suspended from the boiler and the front end from the front of the main frame, substantially as described.

In witness whereof I have hereunto set my hand.

JACOB PRICE.

Witnesses:

S. H. NOURSE.  
H. C. LEE.