

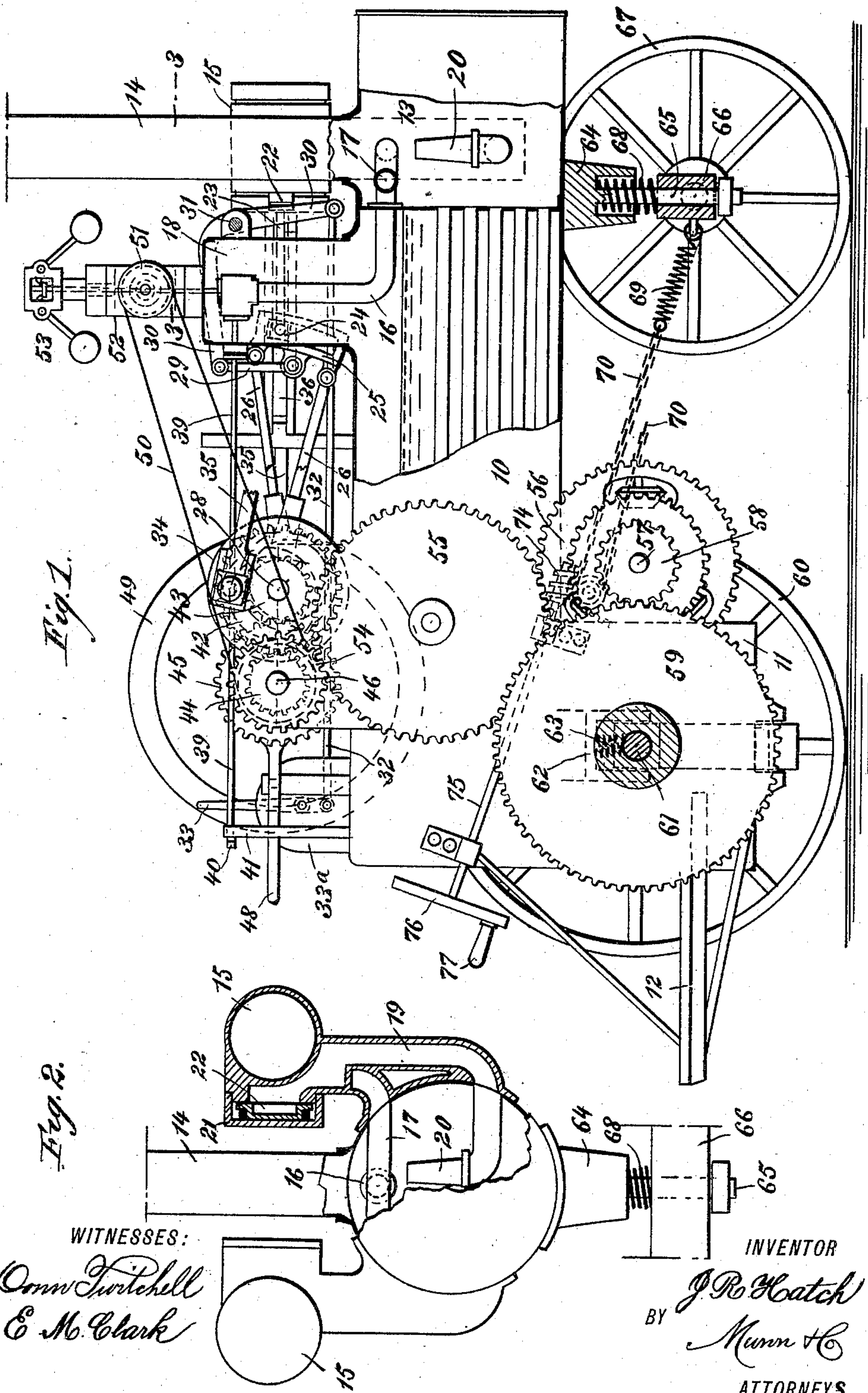
(No Model.)

2 Sheets—Sheet 1.

J. R. HATCH.
TRACTION ENGINE.

No. 474,738.

Patented May 10, 1892.



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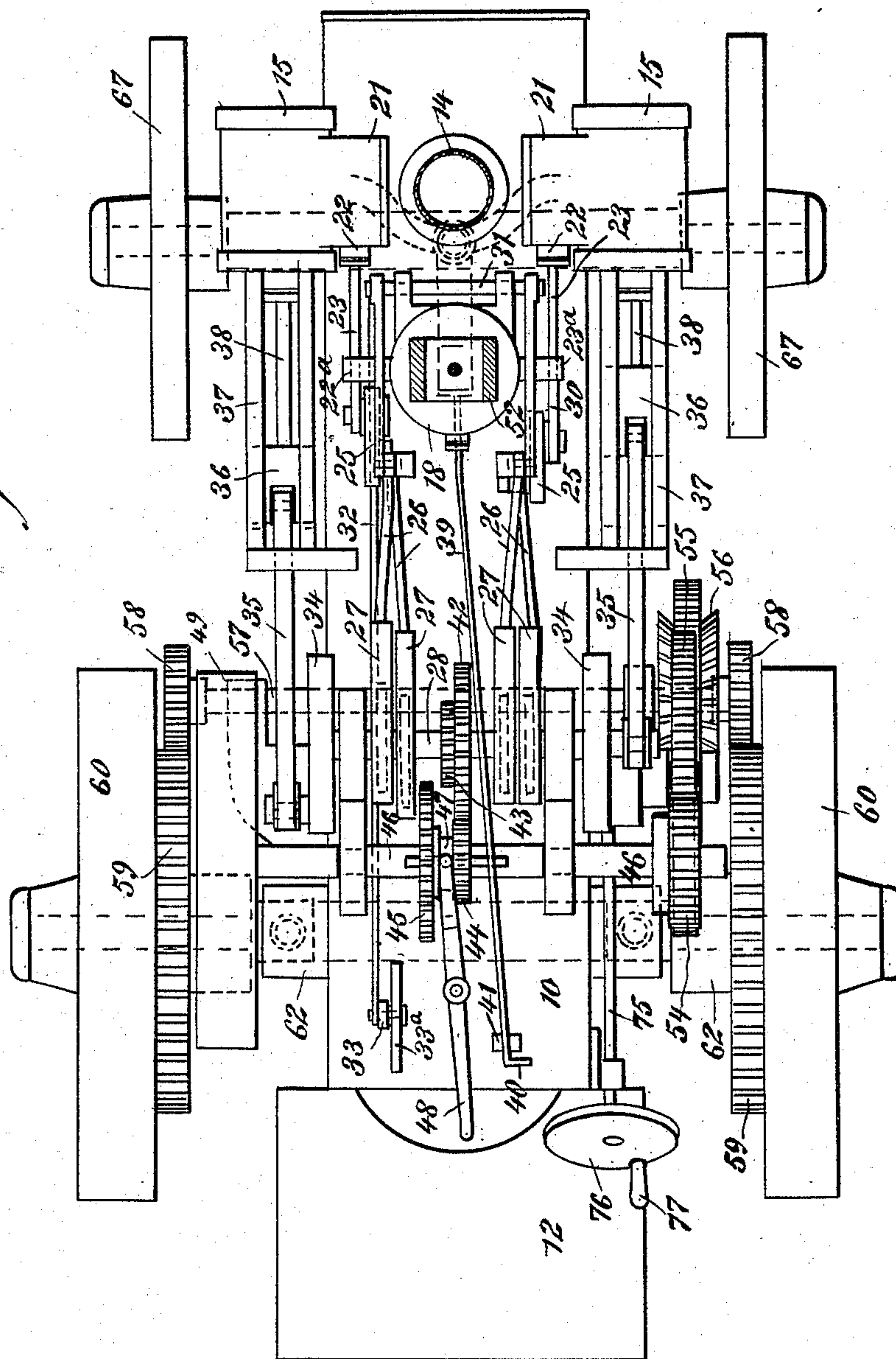
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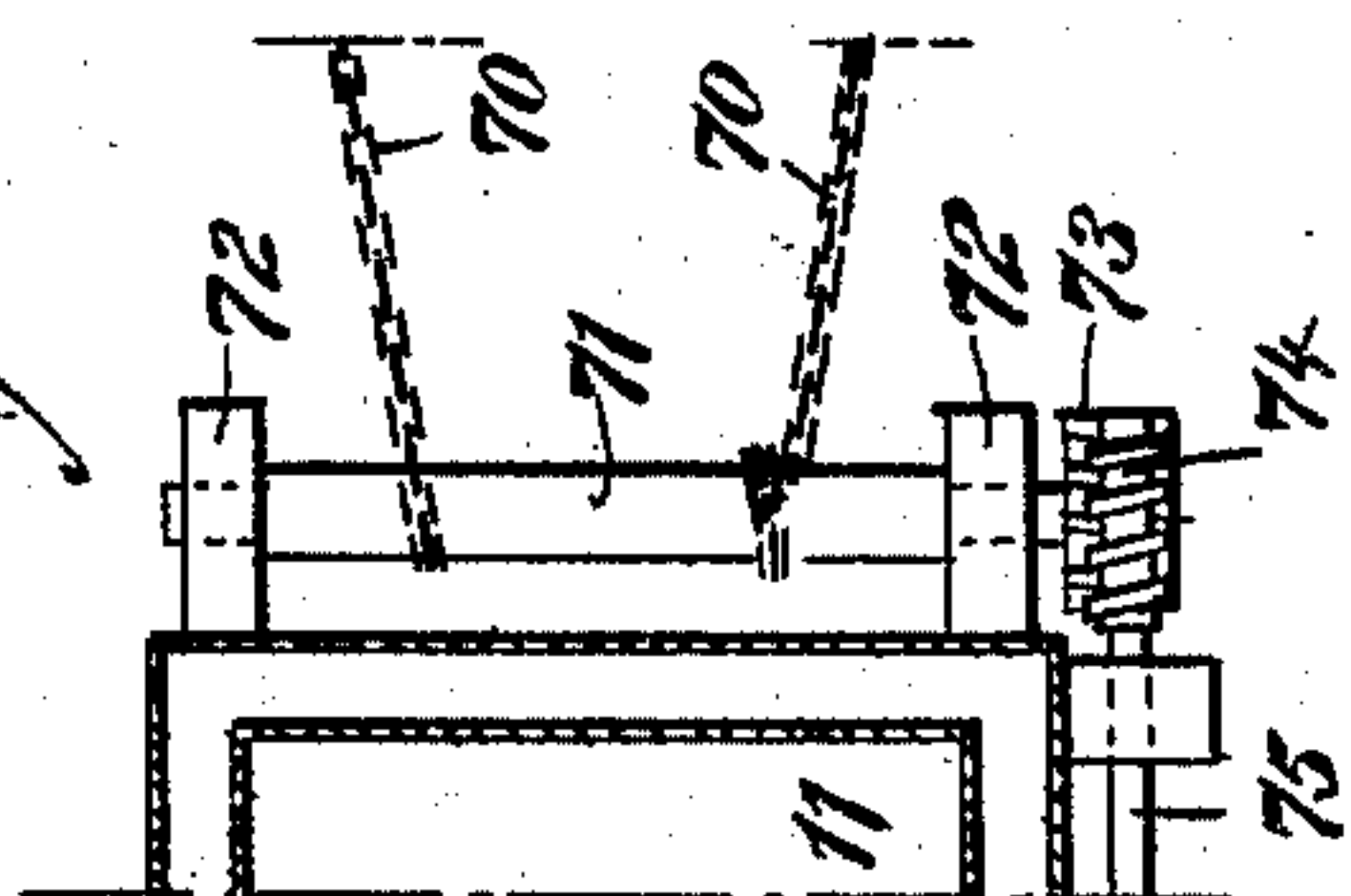
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Fig. 3.



WITNESSES:
Donn Twitchell
E. M. Clark

Fig. 4.



INVENTOR.
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UNITED STATES PATENT OFFICE.

JOHN R. HATCH, OF SUGAR LAKE, MISSOURI.

TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 474,738, dated May 10, 1892.

Application filed September 30, 1891. Serial No. 407,263. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. HATCH, of Sugar Lake, in the county of Platte and State of Missouri, have invented a new and Improved Traction-Engine, of which the following is a full, clear, and exact description.

My invention relates to improvements in traction-engines such as are specially adapted for driving thrashing-machines and for doing similar work; and the object of my invention is to produce a compact and efficient machine which is well adapted to travel over uneven roads, which may be run with a relatively small amount of fuel, which is adapted to carry a heavy load, and which is provided with means for changing its speed without changing the strokes of the engines.

To this end my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a broken side elevation, partly in section, of the engine embodying my invention. Fig. 2 is a broken end view showing one of the cylinders in section and showing the connection between the cylinder and the boiler and smoke-box. Fig. 3 is a sectional plan of the engine on the line 3 3 in Fig. 1, and Fig. 4 is a detail sectional view of the steering-shaft and the means for operating it.

The engine is provided with the common form of boiler 10, which has at one end the usual fire-box 11, with the platform 12 arranged behind it, and which has at the front end a common form of smoke-box 13, with a smoke-stack 14 opening from its upper side. The boiler and the mechanism connected therewith are mounted on wheels in the manner hereinafter described. At the front end of the boiler and on each side of the smoke-stack is the usual cylinder 15, and the cylinders are arranged at slightly-different angles, so that there will be no dead-center. The cylinders are supported upon a suitable framework and are supplied with direct steam by a pipe 16, which leads from the boiler and into the smoke-box, where it terminates in a T, forming branch pipes 17, which extend to the

cylinders, and this arrangement prevents the steam-pipe from being exposed to the air, and thus provides against any extensive condensation. The supply-pipe 16 opens from the steam-dome 18, which is arranged near the front end of the boiler immediately in the rear of the smoke-stack 14. The exhaust-pipes 19 of the cylinders 15 also lead into the smoke-box and terminate in a nozzle 20, which is arranged vertically beneath the smoke-stack, and the exhaust-steam assists the draft. Each cylinder 15 is provided with the usual steam-chest 21, having a common form of slide-valve 22 therein, and the valve 22 connects by means of a rod 23 in the rear of the steam-chest with a block 24, and the rod 23 is held to slide in a suitable hanger 23^a on the side of the dome 18, and the block will consequently be held to move in a definite horizontal plane.

A common form of link 25 slides on the block 24, as best shown in Fig. 1, and the upper and lower ends of the link 25 are pivoted to connecting-rods 26, which rods extend rearward and terminate in eccentrics 27, mounted on a counter-shaft 28, which is held in suitable bearings and extends transversely across the boiler top. The link 25 is centrally pivoted to a nearly-vertical rod 29, and the latter is pivoted to the upper arm of an elbow-lever 30, which is secured to a shaft 31, extending across the front of the dome 18 and turning in suitable bearings, and the shaft 31 has one of these elbow-levers 30 at each end, and the two engine-links are connected with these levers, so that when one is operated the other will be also operated. The lower end of one of the elbow-levers 30 is pivoted to a rod 32, which extends rearwardly along the boiler top and connects with a lever 33, which turns over a common form of quadrant 33^a, and by moving the lever 33 the elbow 30 will be tilted and the stroke of the engine changed or reversed in the ordinary way.

On the shaft 28, near each end, are disks 34, which have a crank connection with pitman-rods 35, which rods at their front ends are pivoted to cross-heads 36, which move in horizontal slideways 37 on each side of the boiler, and which cross-heads are connected to the piston-rods 38 of the engine-cylinders 15 in the usual way. This counter-shaft 28, to

which the above-mentioned parts are connected, serves as a sort of supplementary driving-shaft, and as it revolves the eccentrics and the link connection described will
 5 operate the slide-valves of the cylinders in the ordinary way.

The upper end of the main supply-pipe 16, which is arranged in the dome 18, is provided with a common throttle-valve, which is oper-
 10 ated by means of a rod 39, which extends rearward over the boiler top and terminates in a handle 40, which rests normally in a support 41, and by manipulating this rod the steam may be turned on and off the cylinders.

15 The counter-shaft 28 has fixed to it, near the center, gear-wheels 42 and 43 of different sizes, and these gear-wheels mesh with similar gear-wheels 44 and 45, which are held to slide on the main driving-shaft 46, which is mounted
 20 in suitable hangers on the boiler top parallel with the shaft 28. The gear-wheels 44 and 45 are keyed to the shaft 46, so that they may slide thereon, but will turn therewith, and the two gear-wheels are connected by a grooved
 25 hub 47, on which the forked end of a lever 48 is mounted, and this lever extends rearward to a point where it may be conveniently operated, and by manipulating the lever the wheels 42 and 44 or 43 and 45 may be thrown
 30 into engagement, and consequently the machine may be changed instantly, so as to run slowly with great power—as, for instance, when it is going uphill—or it may run faster with less power.

35 The driving-shaft 46 carries the usual fly-wheel 49, from which power may be taken, and it also carries a belt 50, connecting with a pulley 51 on the frame 52, which frame is mounted on the top of the steam-dome and
 40 carries the usual form of governor 53, which governor is revolved by the pulley 51. I have not shown this mechanism in detail, as it is of the common form which will be readily understood. The governor is connected with
 45 the engines in the usual way, and as the speed of the machine changes the governor will operate to either increase or decrease the speed of the engines.

On one end of the driving-shaft 46 is a gear-
 50 wheel 54, which meshes with a gear-wheel 55, pivoted on one side of the boiler beneath it, and the latter gear-wheel meshes with a compound gear-wheel 56, of the usual construction, which compound gear-wheel is secured
 55 to a shaft 57, extending transversely beneath the boiler. The shaft 57 has at each end a gear-wheel 58, and these gear-wheels mesh with the larger gear-wheels 59, which are secured to the inner sides of the rear wheels 60
 60 of the machine.

The rear axle 61 of the machine rests in socketed heads 62 on opposite sides of the boiler-frame, and in the sockets of these heads are spiral springs 63, which support the weight
 65 of the boiler and prevent any sudden jar. Beneath the center of the boiler, near the front end, is a depending head 64, having a

central socket on the under side, and extending downward from the center of the socket is a king-bolt 65, which projects through the
 70 front axle 66, thus forming the pivot of the machine, and the front axle is supported in wheels 67 in the usual way. Within the socket of the head 64 is a strong spiral spring 68, which rests upon the axle and which sup-
 75 ports in a yielding manner the front end of the machine.

The following mechanism is employed for steering the machine: Near each end of the forward axle is secured a spiral spring 69, the
 80 rear ends of which springs are secured to chains 70, which extend rearwardly beneath the boiler and are fastened to a steering-shaft 71, which is mounted in hangers 72 on the front of the fire-box 11. This shaft 71 has at
 85 one end a worm-wheel 73, which meshes with a worm 74 on the end of the shaft 75, which shaft extends diagonally upward and rearward, being held in suitable bearings, and it terminates in a disk 76, having a crank-handle
 90 77. It will be seen that by revolving the disk and shaft the shaft 71 may be revolved and the chains 70 wound upon the shaft 71, so as to turn the axle 66 in a desired direc-
 95 tion, and in order that this may be easily done the chains are secured to the shaft, so that when one is wound the other will be unwound. The engine may be provided with any com-
 100 mon form of feed-pump or injector and any of the ordinary mechanisms not shown in the drawings may be connected therewith in the usual way.

From the foregoing description it will be seen that the steam is conveyed to the cylinders without exposing the steam-pipes to the
 105 open air, that a convenient means is provided for changing the speed of the engine, that both cylinders of the engine have their steam-inlets controlled by one governor, and that the general construction of the machine pro-
 110 vides for efficient work.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a traction-engine, the combination, 115
 with the supporting-wheels, gear-wheels on the rear wheels, a boiler mounted on the wheels, the engine-cylinders on opposite sides of the boiler, the steam-chests, and the slide-
 120 valve of the said chests, of a counter-shaft above the boiler, connections between the said shaft and the engine-pistons and slide-valves, a drive-shaft parallel with the counter-shaft and provided with a gear-wheel at one end, a differential-gear connection between the said
 125 shafts, a gear-wheel at one side of the boiler and meshing with the gear-wheel on the drive-shaft, and a transverse shaft beneath the boiler and provided with a gear-wheel at each end meshing with the gear-wheels of the rear
 130 drive-wheels and with a gear-wheel near one end meshing with the gear-wheel on the side of the boiler, substantially as herein shown and described.

2. In a traction-engine, the combination, with the boiler having a steam-dome near the front end, the engine-cylinders arranged on opposite sides of the boiler, the steam-pipe leading from the steam-dome to the engine-cylinders, and the governor mounted upon the steam-dome and adapted to control the engines, of a counter-shaft mounted transversely on the boiler and connected with the engine-pistons, a driving-shaft arranged parallel with the counter-shaft, gearing between the driving-shaft and the drive-wheels, a differential-gear connection between the driving-shaft and counter-shaft, and means for revolving the governor from the driving-shaft, substantially as described.

3. In a traction-engine, the combination, with the engine-cylinders, the steam-chests, and the slide-valves, of a drive-shaft, a counter-shaft driven from the drive-shaft and provided with eccentrics, a link connected to the eccentrics, a block sliding in the link and connected to the slide-valves, a pivoted elbow-lever, a rod connecting the elbow-lever to the

link, and an operating-rod connected to the elbow-lever, substantially as herein shown and described.

4. In a traction-engine, the combination, with the boiler and front axle, of a head secured to the boiler and having a socket on the under side and provided with a king-bolt extending from the center of the socket through the axle, and a spiral spring in the socket and resting upon the axle, substantially as described.

5. In a traction-engine, the combination, with the main frame and the forward axle, of a transverse shaft mounted in the rear of the axle and provided with chains having a spring connection with the opposite ends of the axle, and a worm and gear mechanism for turning the transverse shaft, substantially as described.

JOHN R. HATCH.

Witnesses:

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