No. 812,137. PATENTED FEB. 6, 1906.

W. S. KELLEY.

TRACTION ENGINE.

APPLICATION FILED OCT. 17, 1904.

6 SHEETS—SHEET 1.

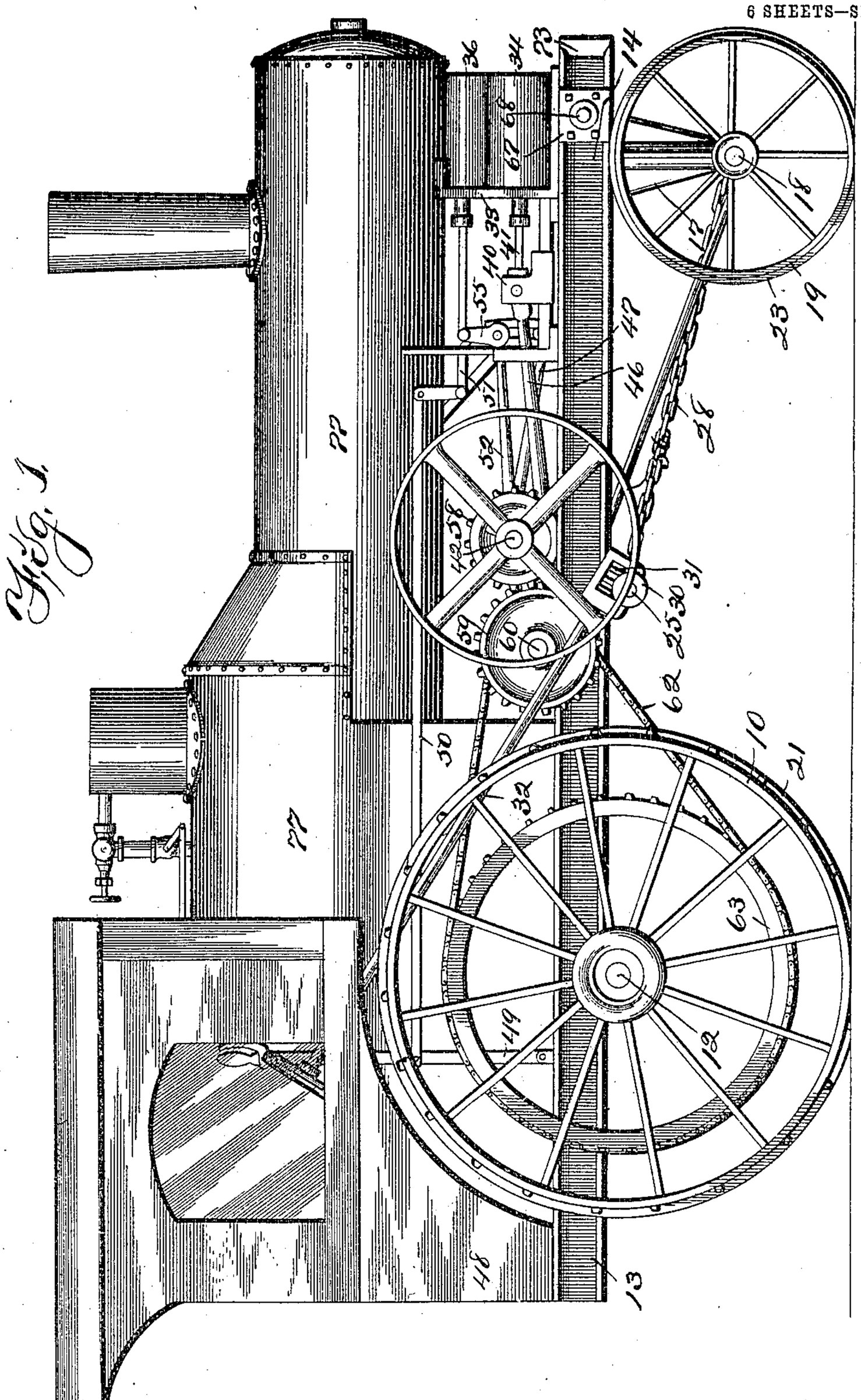

Fig. 1.

Attest:
R. B. Owrig.
L. H. Owrig.

Inventor Wilbur S. Kelley
by J. C. Swett Atty.

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6 SHEETS—SHEET 2.

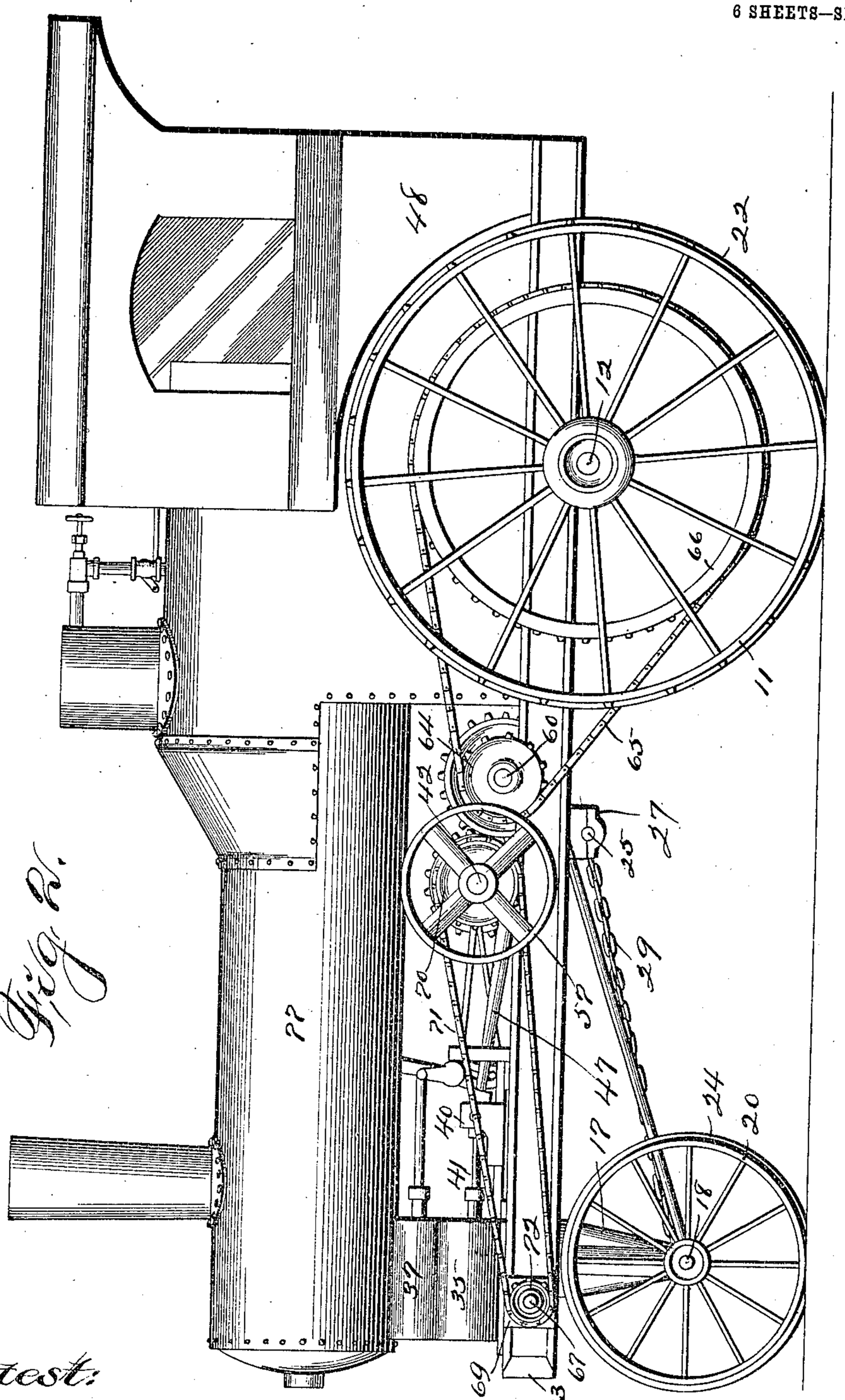

Fig. 2.

Attest:

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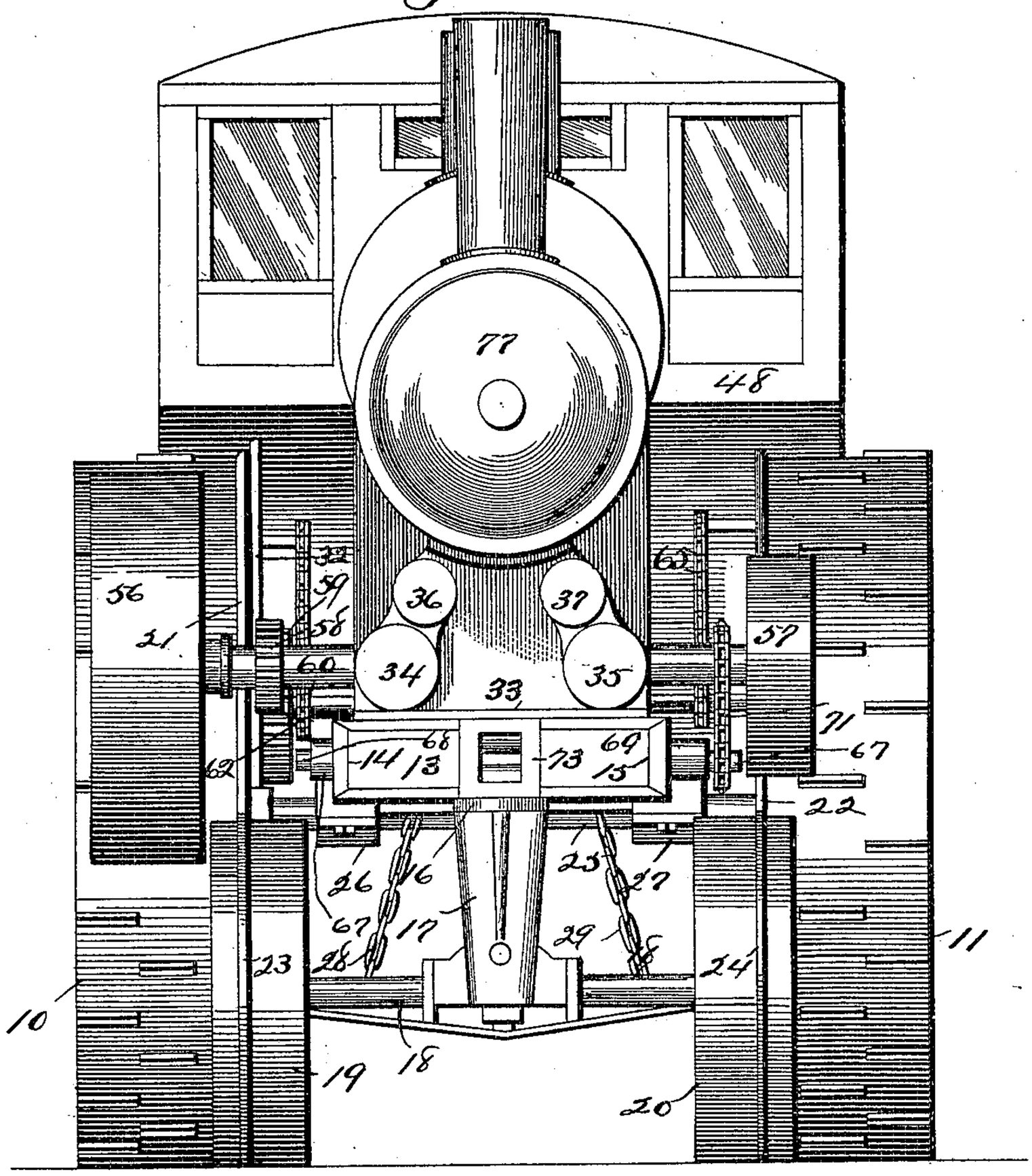
6 SHEETS—SHEET 3.

Fig. 3.



Attest:
R. B. Orwig.
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Inventor Wilbur S. Kelley
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6 SHEETS—SHEET 4.

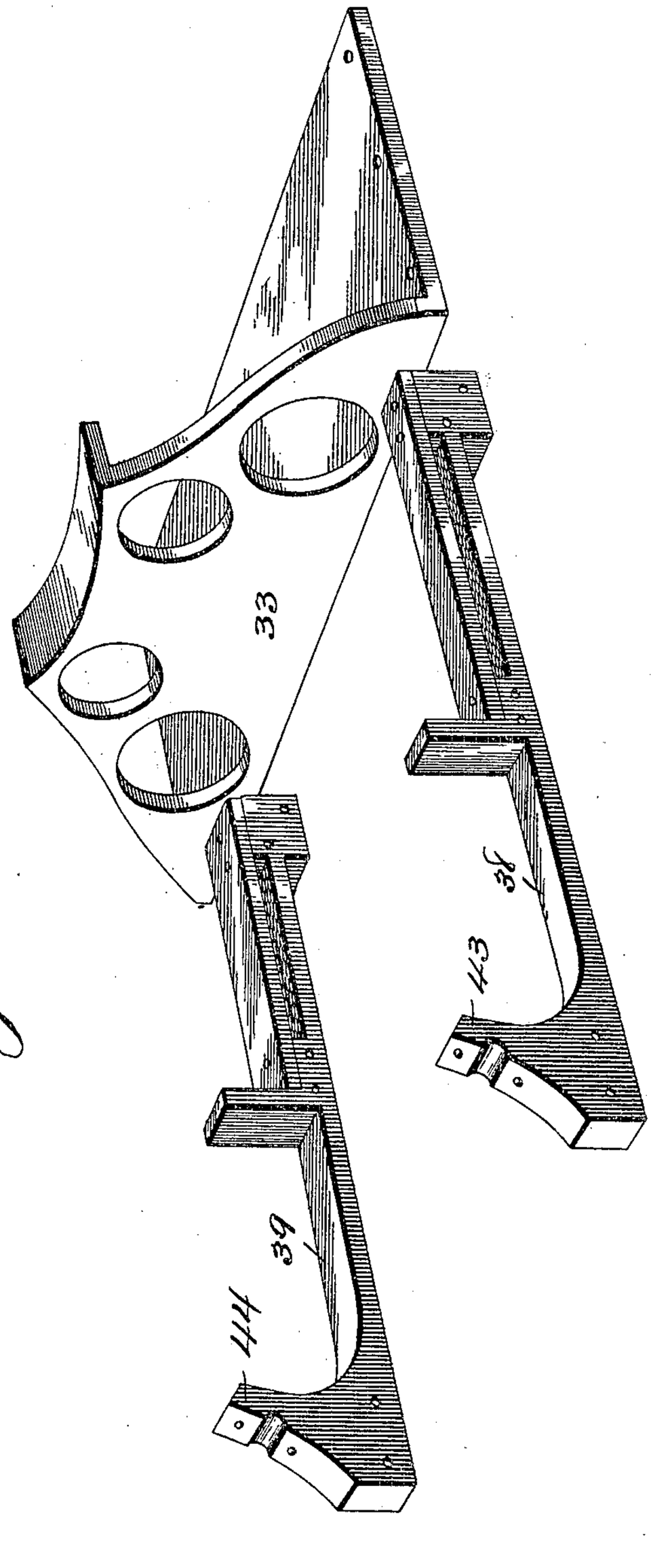

Fig. 4.

Attest:
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6 SHEETS—SHEET 5.

Fig. 5.

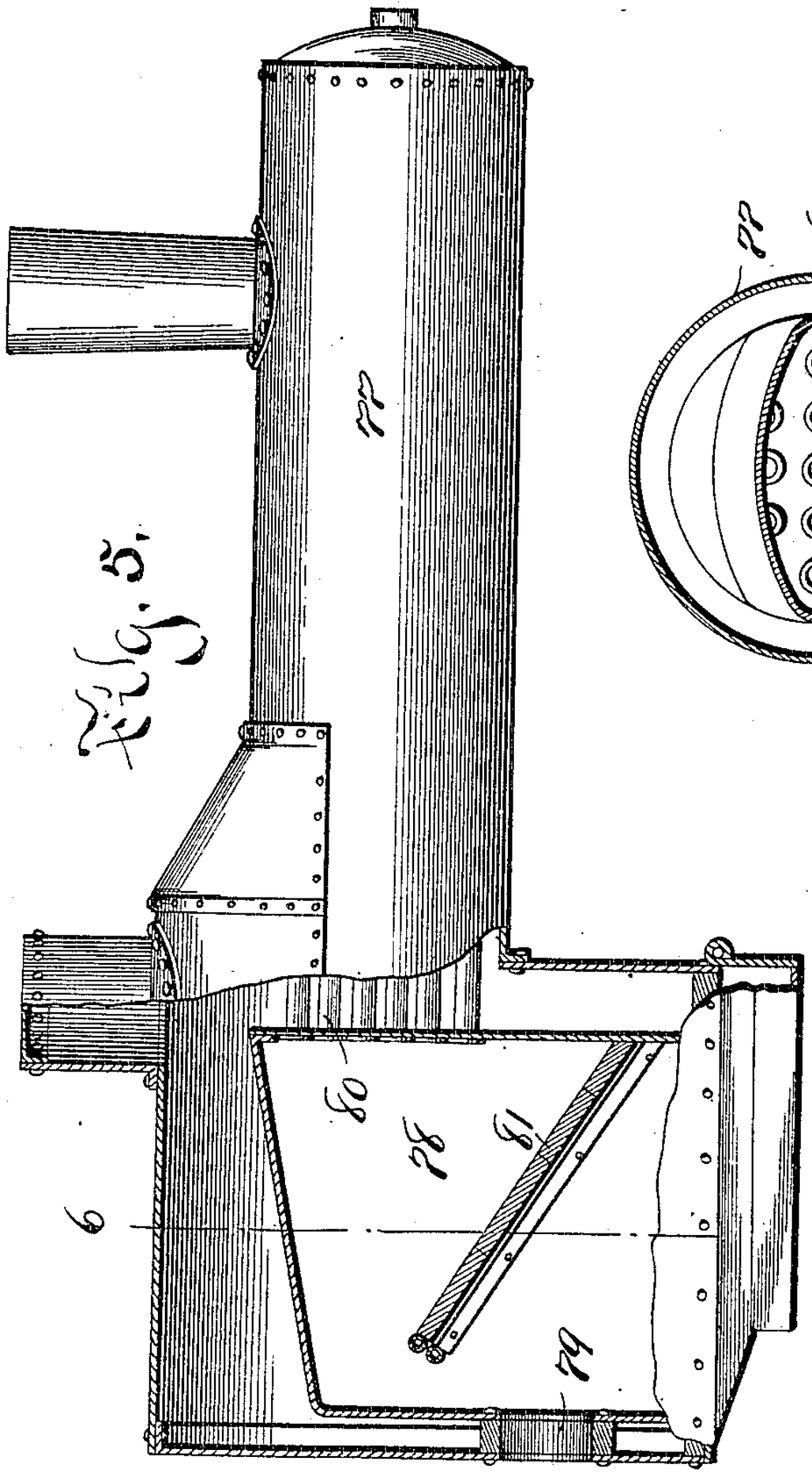


Fig. 6.

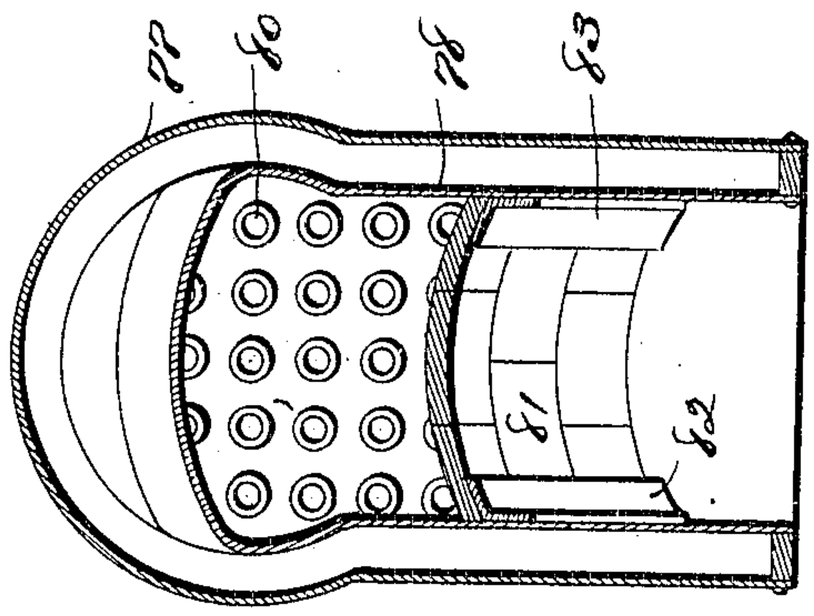
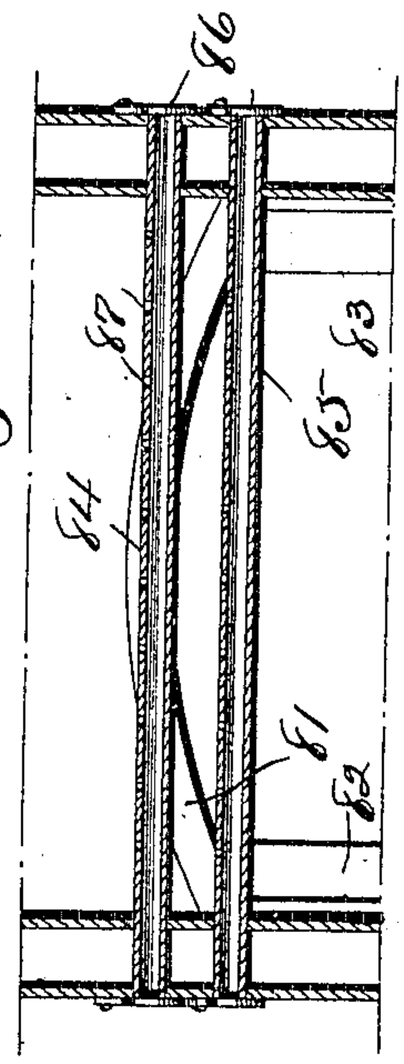


Fig. 7.



Attest:
R. G. Orwig.
L. H. Orwig.

Inventor:
Wilbur S. Kelley,
by J. C. Church
Atty.

No. 812,137. PATENTED FEB. 6, 1906.

W. S. KELLEY.

TRACTION ENGINE.

APPLICATION FILED OCT. 17, 1904.

6 SHEETS—SHEET 6.

Fig. 8.

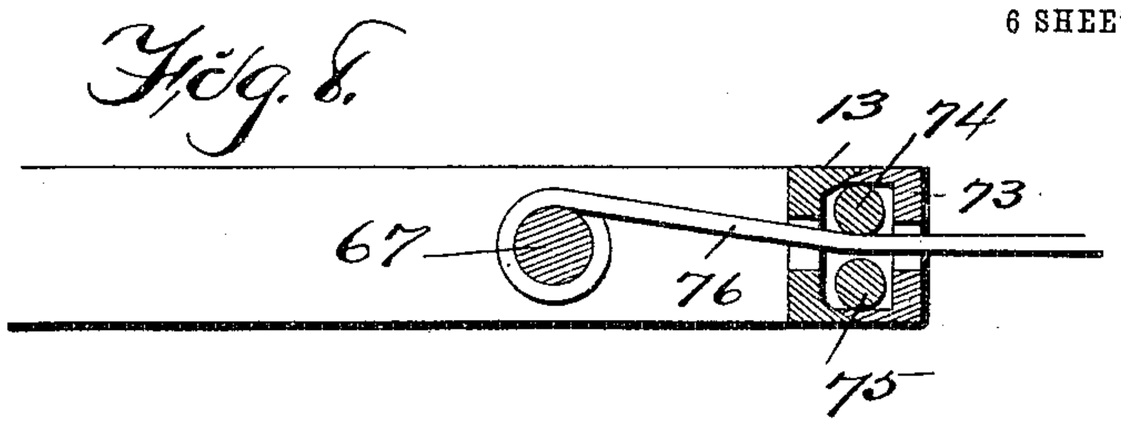


Fig. 9.

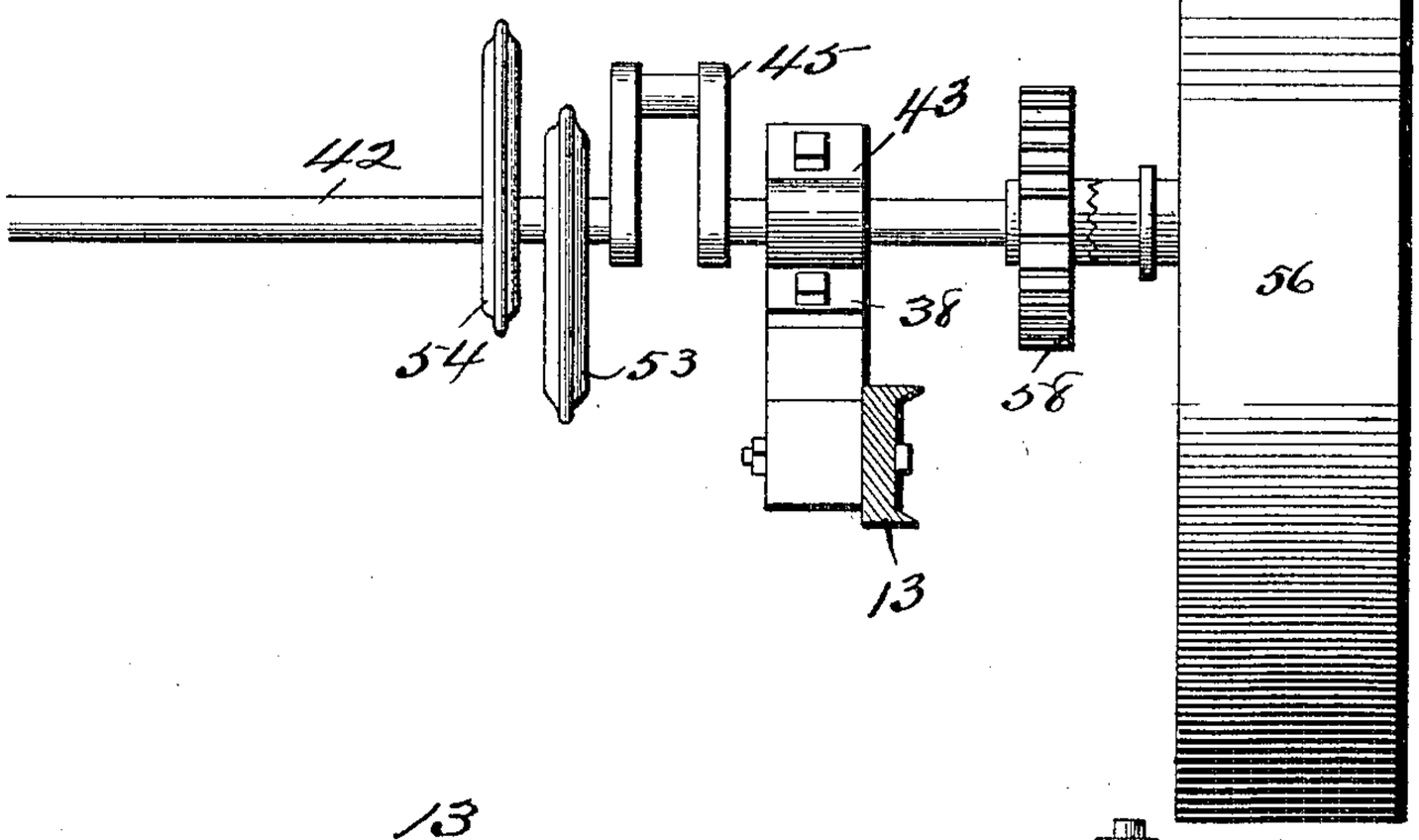
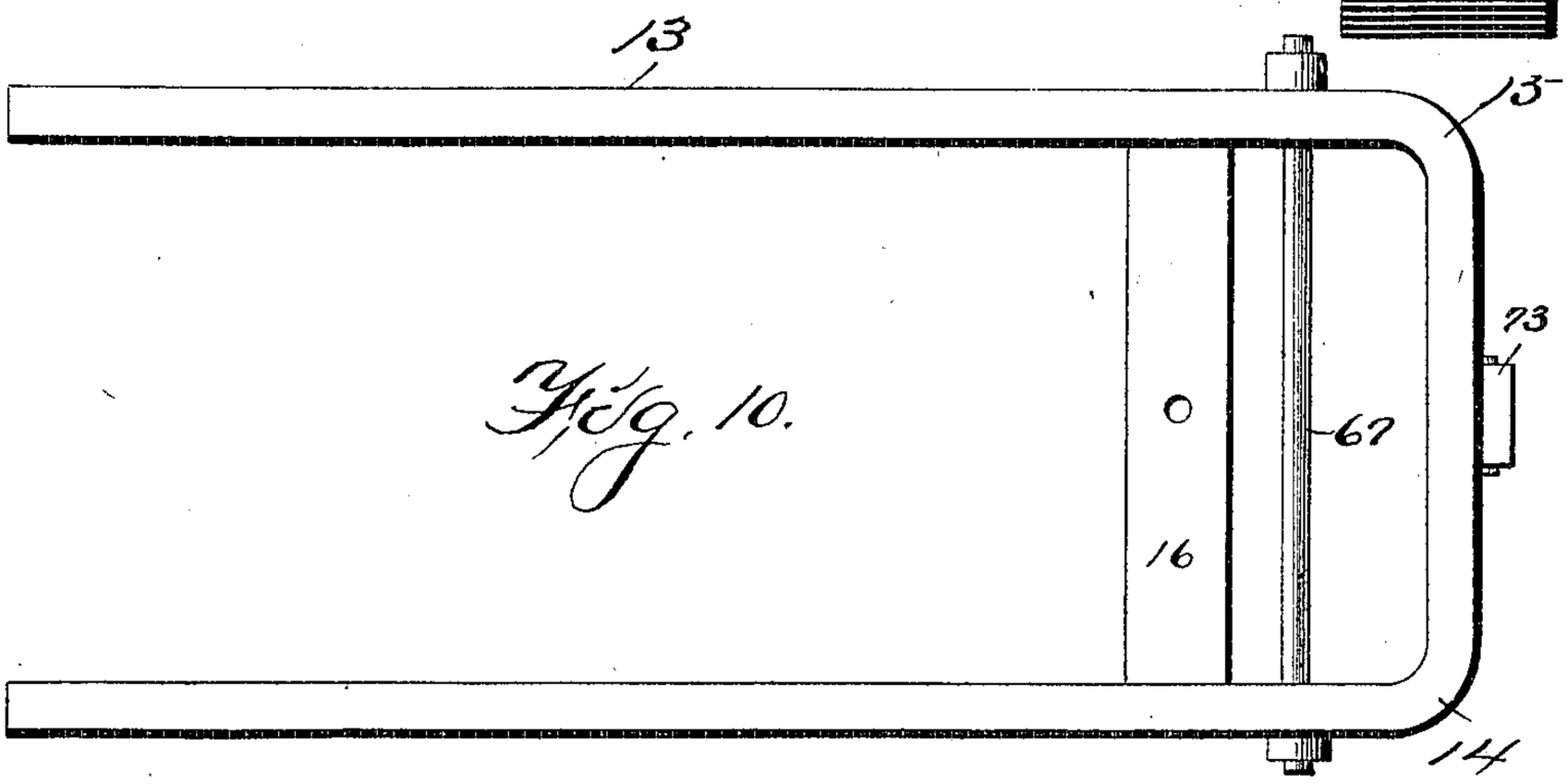


Fig. 10.



Attest:
R. B. Orwig.
L. H. Orwig.

Inventor: Wilbur S. Kelley
by J. C. Sweeb Atty.

UNITED STATES PATENT OFFICE.

WILBUR S. KELLEY, OF NEWTON, IOWA, ASSIGNOR OF ONE-HALF TO CHARLES C. KOEPER, OF NEWTON, IOWA.

TRACTION-ENGINE.

No. 812,137. Specification of Letters Patent. Patented Feb. 6, 1906.

Application filed October 17, 1904. Serial No. 228,884.

To all whom it may concern:

Be it known that I, WILBUR S. KELLEY, a citizen of the United States of America, and a resident of Newton, Jasper county, Iowa, have invented a new and useful Traction-Engine, of which the following is a specification.

The object of this invention is to provide a construction for traction-engines in which all of the vibrating parts are carried on a rigid frame separate from and independent of the boiler.

A further object of this invention is to provide a rigid frame for traction-engines susceptible of carrying the working parts of the engine and driving mechanism independent of the boiler and also susceptible of carrying the boiler.

A further object of this invention is to provide an engine and driving mechanism carried by a rigid frame independent of and separate from a boiler also carried by said frame.

A further object of this invention is to provide improved means of connecting an engine with traction mechanism.

A further object of this invention is to provide improved means for connecting an engine with driving mechanism.

A further object of this invention is to provide means for connecting the driving mechanism of an engine with a fixed object for the purpose of advancing said engine on the ground independent of its traction mechanism.

A further object of this invention is to provide drawing or hoisting mechanism in a traction-engine whereby a load may be moved toward said traction-engine or hoisted independent of the traction mechanism of the engine.

A further object of this invention is to provide means for mounting a steering mechanism of a traction-engine on a rigid frame independent of the traction mechanism, drawing mechanism, or boiler.

My invention consists in the construction, arrangement, and combination of elements hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which—

Figure 1 is an elevation of one side of the complete traction-engine. Fig. 2 is an elevation of the traction-engine opposite Fig. 1. Fig. 3 is a front elevation of the complete engine. Fig. 4 is a perspective illustrating the construction of portions of the supporting devices. Fig. 5 is an elevation, partly in section, illustrating the combustion-chamber and a portion of a boiler. Fig. 6 is a cross-section of the combustion-chamber on the indicated line 6 6 of Fig. 5. Fig. 7 is a detailed view, partly in section, illustrating part of the construction in the combustion-chamber. Fig. 8 is a detailed view illustrating the construction of the drawing or hoisting mechanism. Fig. 9 is an elevation, partly in section, illustrating portions of the driving mechanism. Fig. 10 is a plan, partly in section, illustrating the rigid frame and parts of the devices attached thereto.

In the construction of the apparatus as shown the numerals 10 11 designate traction-wheels, which may be any desired form and construction. An axle 12 is mounted at its ends in and is carried by the traction-wheels 10 11. A frame 13 is provided and is formed, preferably, of a single piece of channel steel or iron bent at the points 14 15 on opposite sides of and near its center and having its side portions or arms extended from the point of bending in parallel planes. The rear end portions of the arms of the frame 13 are mounted on and carried by the axle 12, to which they are secured. The forward (closed) end portion of the frame 13 is carried on a fifth-wheel 16, and said fifth-wheel is supported on a bolster 17, carried by the central portion of a forward axle 18. The forward axle 18 is supported at its ends in steering-wheels 19 20. The traction-wheels 10 11 preferably are constructed according to the description contained in my companion application executed on even date herewith and pending concurrently and are provided with flanges 21 22 on their inner margins. The steering-wheels 19 20 preferably are formed with flanges 23 24 intermediate of the side margins of their rims, and the gage of the steering-truck relative to the traction-truck is such that when the engine is proceeding on a straight line the flanges 21 22 will track with the flanges 23 24 and the combined trucks will make broad tracks on the surface over which they travel. The flanges on the traction-wheels and steering-wheels alike tend to prevent sluing or lateral movement of the machine carried thereby.

A steering-shaft 25 is mounted in bearings 26 27, depending from central portions of the

frame 13, and steering-chains 28 29 connect the end portions of said shaft to the axle 18 and are adapted to be wound on said shaft alternately. A worm-wheel 30 is fixed to one end portion of the steering-shaft 25 and is engaged by a worm 31 on one end portion of a steering-rod 32, mounted for rotation in suitable bearings and extending within reach of the engineer, as hereinafter described. A pillow-block 33, Fig. 4, is mounted on and fixed to the forward (closed) end portion of the frame 13, and steam-cylinders 34 35 and steam-chests 36 37 are mounted on and carried by said pillow-block. Engine-beds 38 39 are mounted on and fixed to the inner faces of the frame 13 at the rear of the pillow-block 33, and pitman-slides 40 are mounted thereon and connected to piston-rods 41, entering the cylinders 34 35 and arranged to operate pistons in said cylinders in a conventional manner. A crank-shaft 42 is mounted for rotation in bearings 43 44, mounted on or fixed to the rear end portions of the engine-beds 38 39, and cranks 45, one only of which is shown in Fig. 9, are formed on said shaft intermediate of its ends and are connected by connecting-rods 46 47 to the pitman-slides 40. A cab 48 is fixed to and rises from the rear (open) end portion of the frame 13, and an engineer's lever or controlling-lever 49 is fulcrumed at one end on said frame, but extends within said cab. A connecting-rod 50 leads from the controlling-lever 49 to a reversing controlling mechanism 51, which in turn is connected to the eccentric-rods 52, acted upon by eccentrics 53 54 on the crank-shaft 42, also connected to the piston-rods 55, leading into the steam-chests 36 37 and controlling the valves therein in a conventional manner. Belt-wheels 56 57 are mounted rigidly on end portions of the crank-shaft 42, projecting beyond the frame 13 and on opposite sides thereof, and either of said belt-wheels may be employed when desired to connect the crank-shaft to a machine to be driven, such as a separator, shredder, or corn-sheller. A spur-gear 58 is fixed to the crank-shaft 42 adjacent to belt-wheel 56 and meshes with a pinion 59 on a counter-shaft 60, which counter-shaft also is supported in bearings fixed to side portions of the frame 13. A sprocket-wheel 61 is mounted rigidly on the counter-shaft 60 adjacent the pinion 59 and is connected by a chain 62 to a sprocket-wheel 63, mounted on the traction-wheel 10. A sprocket-wheel 64 is mounted rigidly on the counter-shaft 60 across the frame from the sprocket-wheel 61 and is connected by a chain 65 to a sprocket-wheel 66 on the traction-wheel 11.

A hoisting-shaft 67 is mounted transversely of the forward (closed) end portion of the frame 13 and is journaled for rotation in bearings 68 69, fixed to said frame. A sprocket-wheel 70 is mounted rigidly on the crank-shaft 42 adjacent the belt-wheel 57 and is connected by a chain 71 to a sprocket-wheel 72 on one end portion of the hoisting-shaft 67. An opening is formed in the center of the forward end portion of the frame 13, and a bearing-block 73 is mounted in front of said opening on the frame and carries loosely mounted therein guide-rollers 74 75, Fig. 8. A cable 76 may be fixed to and wound on the central portion of the hoisting-shaft 67 and extends from said hoisting-shaft through the hole and in front of the frame 13 and between the guide-rollers 74 75 to a point of attachment to the machine or object to be drawn or hoisted. The chain 71 may be removed and disconnect the sprocket-wheels 70 and 72 when it is not desired to employ the hoisting-shaft 67. The pinion 59 is part of a compensating gear of conventional form which will permit one of the traction-wheels to turn independent of the other for the purpose of changing the direction of travel of the entire machine. A clutch mechanism 58[a] may be interposed between the shaft 42 and the spur-gear 58 in order that the spur-gear and traction mechanism may remain stationary at times when it may be desired to employ the power of the engines in driving stationary machinery, such as a separator, shredder, or corn-sheller.

A steam-boiler 77 is mounted at its forward end on the pillow-block 33 and is supported at its rear end portion on the rear portion of the frame 13 directly over the axle 12, a considerable open space existing between the forward portion of the boiler at the rear of the pillow-block for the reception of the driving mechanism on the frame 13, as above described. In and beneath the rear portion of the steam-boiler 77 and supported wholly by the frame 13 over the axle 12 is a combustoin-chamber or fire-box 78, susceptible of being stoked through a doorway 79. The flues 80 of the steam-boiler communicate with the combustion-chamber 78 through the forward wall of said chamber in a common manner. An arch 81, of fire-brick, is mounted transversely of and inclining rearward in the combustion-chamber 78 and is supported at its side margins on angle-bars 82 83, fixed to the side wall of said combustion-chamber. The arch 81 has the effect of compelling flame and heat rising from the fuel in the combustion-chamber to move rearward and upward over the rear upper margin of said arch preliminary to forward travel through the flues 80, and at said upper rear margin of the arch there are located two transverse tubes 84 85, open at their ends and extending at each end through the side walls of the combustion-chamber and the rear portion of the boiler 77. Each end of each tube 84 85 is provided with a closing plate or shutter 86; but when said shutters are open atmospheric air may enter said tubes and discharge therefrom through ports or jets 87 into the space adjacent the

rear upper margin of the arch 81 and into contact with the products of combustion rising over said arch. The commingling of air drawn from the exterior of the boiler and combustion-chamber and discharged at the rear upper margin of the fire-arch 81, with the products of combustion—such as flame, soot, and smoke—rising from the lower portion of said combustion-chamber, tends to stimulate and accelerate combustion in the upper portion of the fire-box, to the end of consuming a maximum portion of the soot and smoke that otherwise would escape to the atmosphere without contributing heat units to the water in the boiler.

It will be observed that the steam-cylinders, steam-chests, link mechanisms, crank-shaft, counter-shaft, steering-shaft and steering-rod, as well as the hoisting mechanism, are supported on the rigid frame 13 independent of the boiler or combustion-chamber and that the boiler and combustion-chamber are mounted on the rigid frame 13 and on the pillow-block supported by said frame independent of the movable mechanism.

It further will be observed that the movable mechanism is located below the major portion of the boiler, and, being entirely distinct therefrom, will not materially agitate or vibrate said boiler in its operation.

I claim as my invention—

1. In an engine, a frame formed of channel-iron bent on opposite sides of its center and having its end portions extended in parallel lines, a steering-truck supporting the closed forward end portion of said frame, a traction-truck supporting the rear open end portion of said frame, an engine and driving mechanism mounted on said frame, detachable connections between said driving mechanism and the traction-truck, a boiler mounted on said frame independent of the engine and driving mechanism, a hoisting-shaft mounted transversely of the forward end portion of said frame, a cable on said shaft, and detachable connections between said hoisting-shaft and the driving mechanism.

2. In a traction-engine, a supporting-frame formed with an aperture in one end, guide-rollers opposite each other and extending into said aperture, a drum-shaft mounted transversely of said frame adjacent said aperture and parallel with said rollers, a cable on said shaft and extending through said aperture between said rollers, and means for driving said shaft.

3. In a traction-engine, a rigid frame, trucks supporting said frame, a pillow-block on said frame, a boiler supported on said pillow-block and frame, engine-beds supported on said frame independent of the boiler, engines supported on said beds independent of the boiler, traction mechanism on said frame independent of the boiler, driving mechanism mounted on said frame independent of the boiler, and adapted to be connected to the traction mechanism at times and to the machine to be driven at times, and connections between said engines and said driving mechanism.

4. In a traction-engine, a rigid frame, a traction-truck supporting the rear end of said frame, a steering-truck supporting the forward end of said frame, a boiler mounted on said frame, steering mechanism mounted on said frame and connected with said steering-truck, driving mechanism mounted on said frame and arranged for connection with the traction mechanism at times and with a machine to be driven at times, an engine mounted on said frame, connections between said engine and the driving mechanism, a hoisting mechanism carried by said frame and arranged to be connected to the driving mechanism at times, a cable leading from said hoisting mechanism, guides for said cable, the steering mechanism, driving mechanism, engine, connections and hoisting mechanism being independent of the boiler.

5. In a traction-engine, a rigid frame, a traction-truck supporting the rear end of said frame, a steering-truck supporting the forward end of said frame, a boiler mounted on said frame, steering mechanism mounted on said frame and connected with said steering-truck, driving mechanism mounted on said frame and arranged for connection with the traction mechanism at times and with a machine to be driven at times, an engine mounted on said frame, connections between said engine and the driving mechanism, a hoisting mechanism carried by said frame and arranged to be connected to the driving mechanism at times, the rigid frame formed with an opening in its forward end, guides above and below said opening, and a cable leading from said hoisting mechanism through said opening and between said guides, the steering mechanism, driving mechanism, engine, connections and hoisting mechanism being independent of the boiler.

6. In a traction-engine, a rigid frame, trucks supporting said frame, a pillow-block on said frame, a boiler supported on said pillow-block and frame, engine-beds supported on said frame independent of the boiler, engines supported on said beds independent of the boiler, traction mechanism on said frame independent of the boiler, driving mechanism mounted on said frame independent of the boiler, and adapted to be connected to the traction mechanism at times and to a machine to be driven at times, connections between said engines and said driving mechanism, a hoisting mechanism carried by said frame independent of the boiler, detachable connections between said hoisting mechanism and the driving mechanism, a cable leading from said hoisting mechanism, and guides for said cable.

7. In a traction-engine, a rigid frame, traction-trucks and steering-trucks supporting said frame, an engine and driving mechanism on said frame, detachable connections between said driving mechanism and the traction-trucks, a hoisting-shaft transversely of said frame, detachable connections between said hoisting-shaft and the driving mechanism and a cable leading from and adapted to be wound on said hoisting-shaft.

8. In an engine a frame formed of channel-iron bent on opposite sides of its center and having its end portions extended in parallel lines, a steering-truck supporting the closed forward end portion of said frame, a traction-truck supporting the rear open end portion of said frame, an engine and driving mechanism mounted on said frame, detachable connections between said driving mechanism and the traction-truck, and a boiler mounted on said frame independent of the engine and driving mechanism.

9. In an engine, a supporting-frame formed with an aperture in its forward end, an engine and driving mechanism mounted on said frame, a hoisting-shaft mounted across said frame, detachable connections between said driving mechanism and hoisting-shaft, guide-rollers on said frame above and below the apertures therein, and a cable leading from and adapted to be wound on said hoisting-shaft and extending through said aperture and between said guide-rollers.

10. In a traction-engine, a rigid frame, trucks supporting said frame, a pillow-block on said frame, a boiler supported on said pillow-block and frame, engine-beds supported on said frame independent of the boiler, engines supported on said beds independent of said boiler, driving mechanism actuated by said engines, traction mechanism arranged for attachment to said driving mechanism at times, and steering mechanism arranged for manual operation of the forward truck.

Signed by me at Newton, Iowa, this 16th day of March, 1904.

WILBUR S. KELLEY.

Witnesses:
H. REYNOLDS,
FRANK F. HARTWIG