

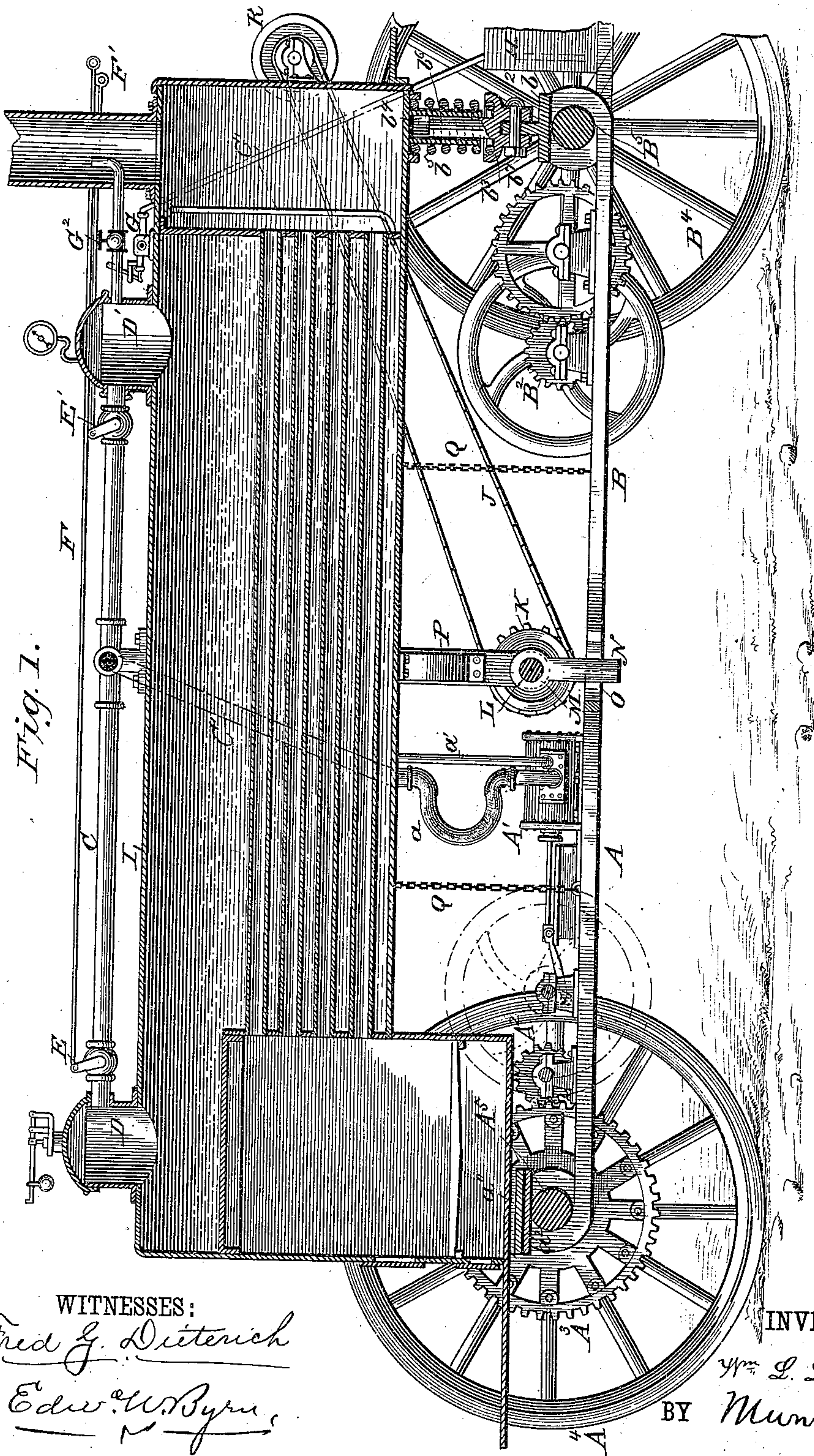
(No Model.)

3 Sheets—Sheet 1.

W. L. LELAND.
TRACTION ENGINE.

No. 355,940.

Patented Jan. 11, 1887.



WITNESSES:
Fred G. Dieterich
Edw. W. Byrnes

INVENTOR:
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BY *Munn & Co.*
ATTORNEYS.

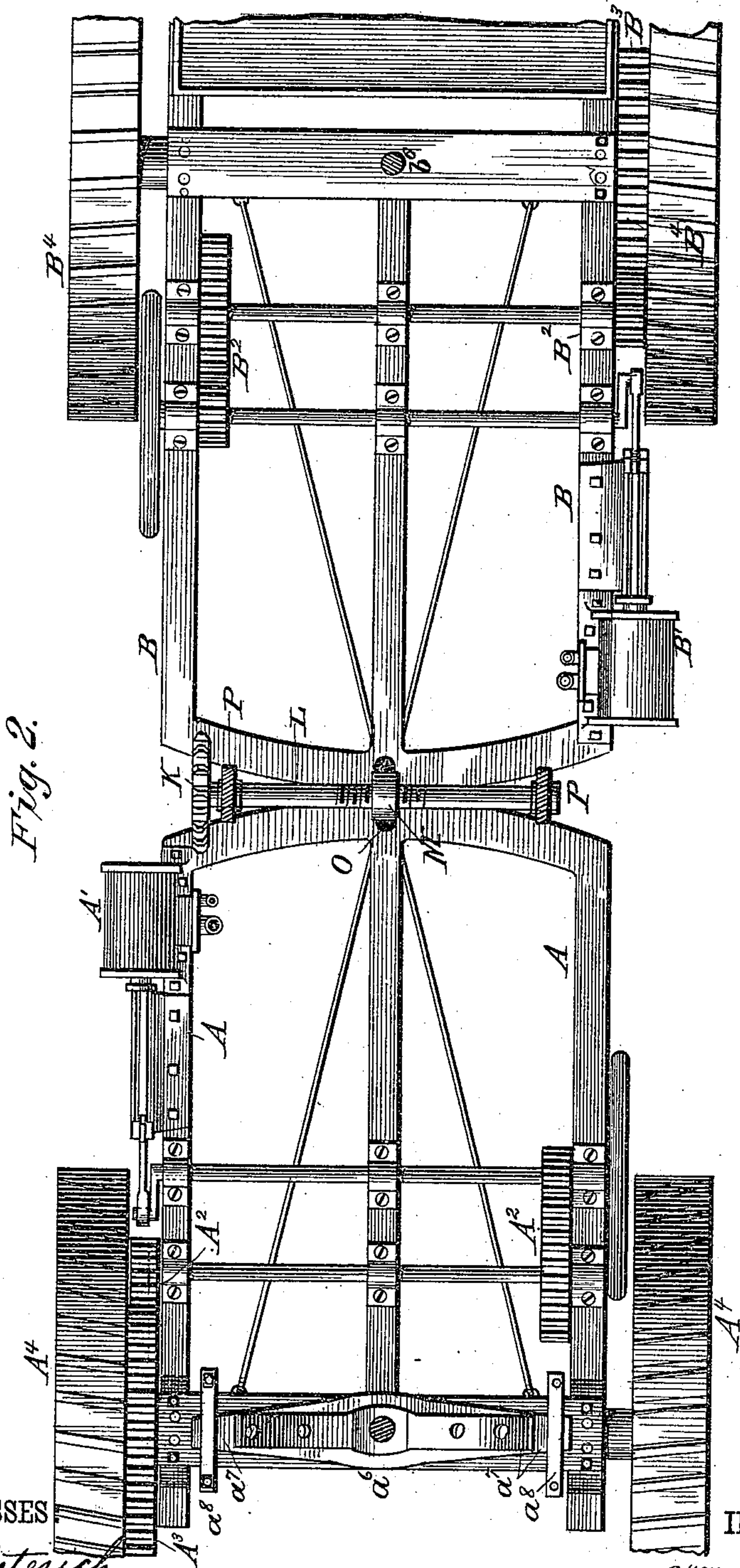
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3 Sheets—Sheet 3.

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Fig. 3.

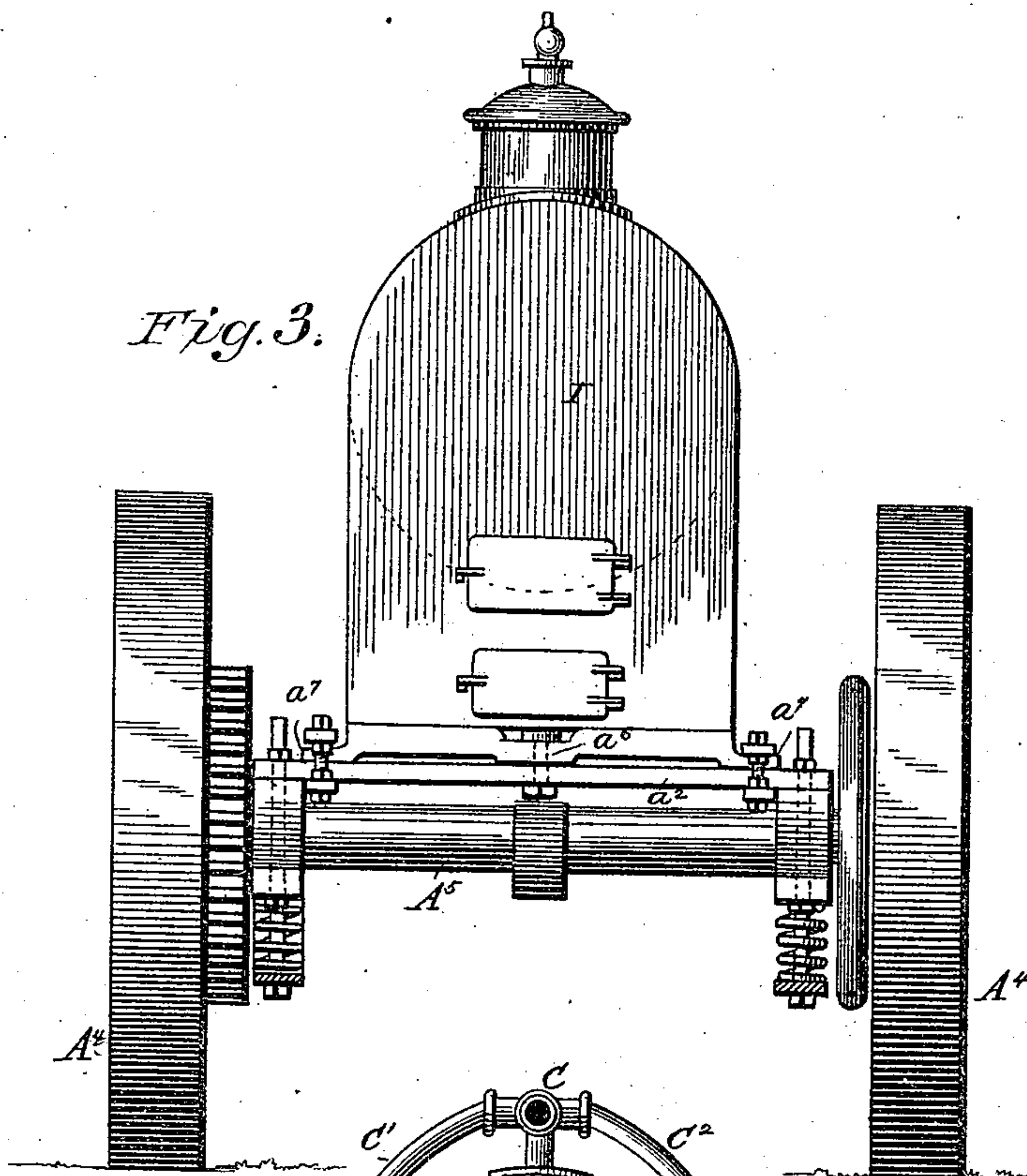


Fig. 4.

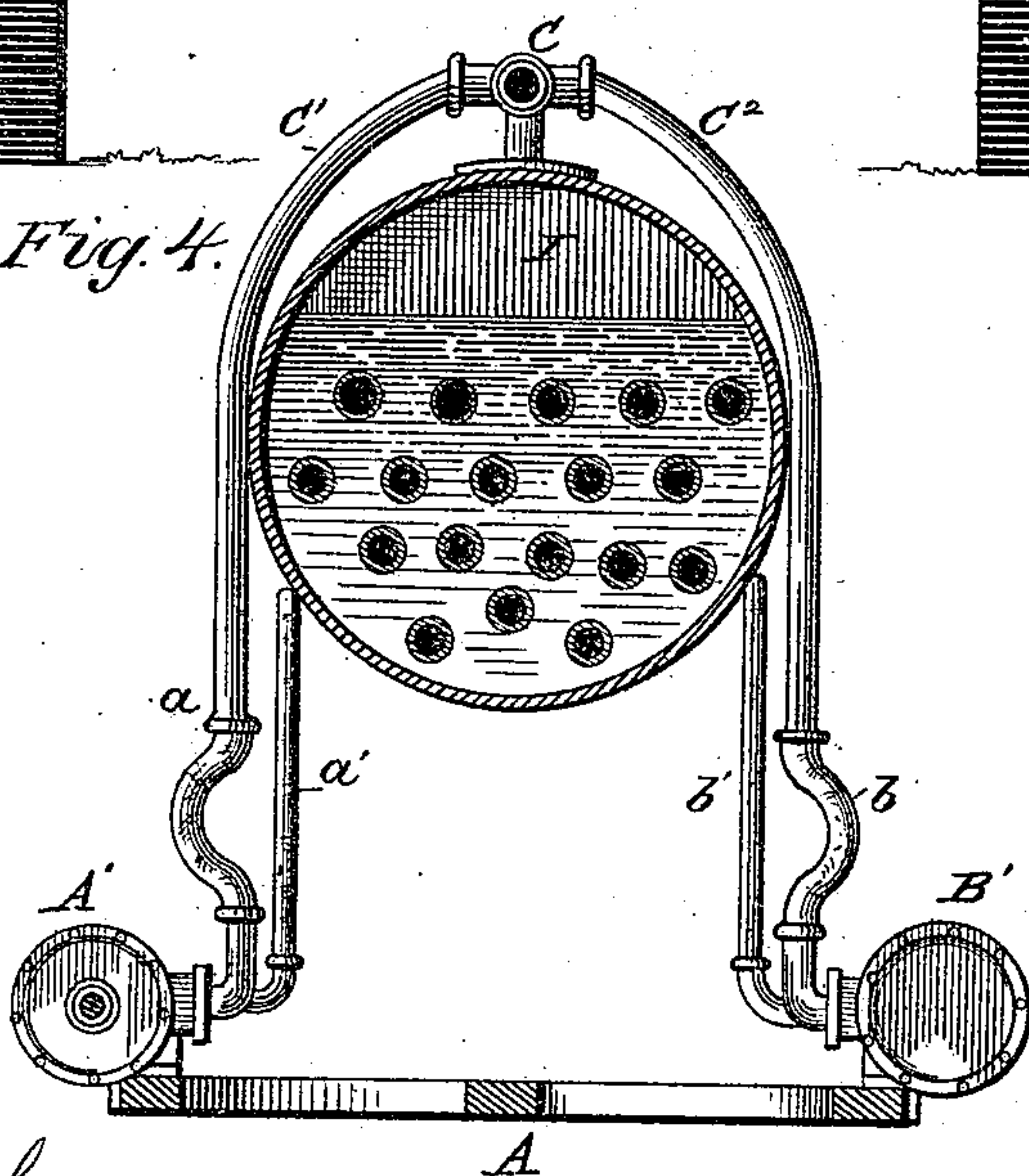


Fig. 6.

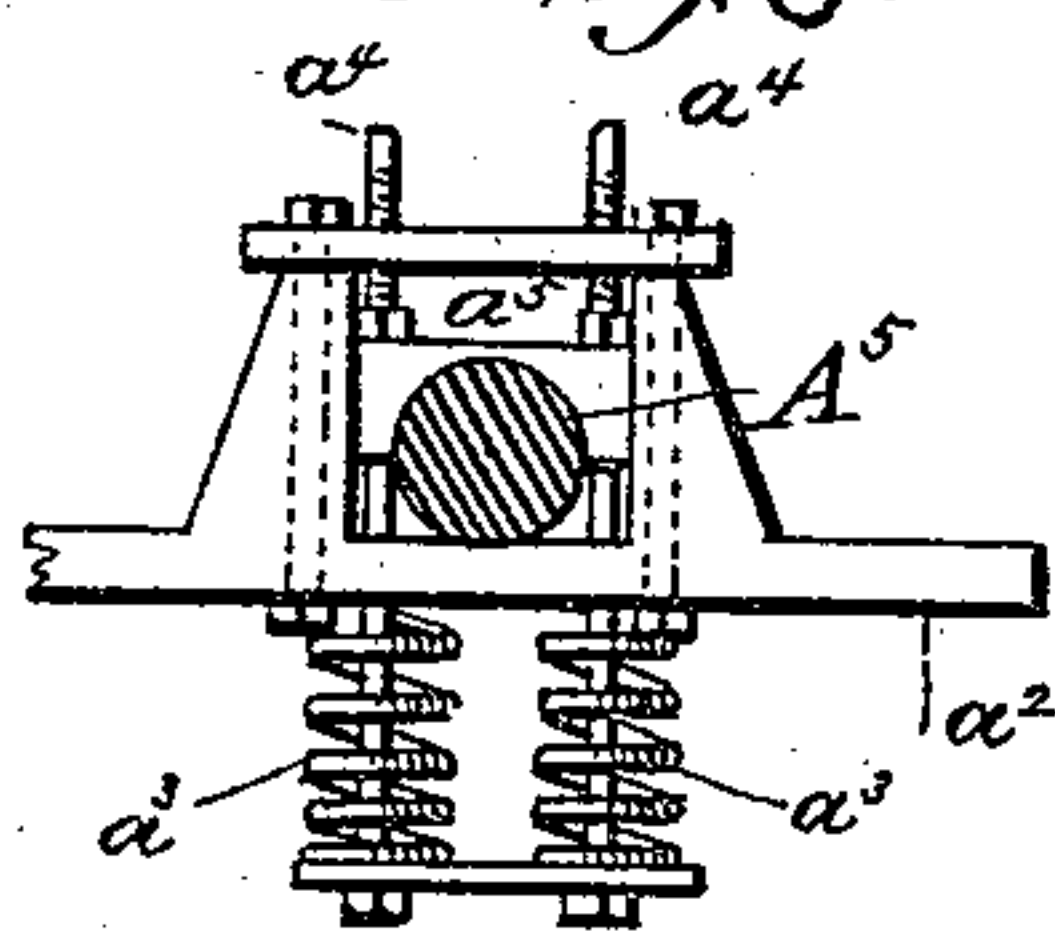
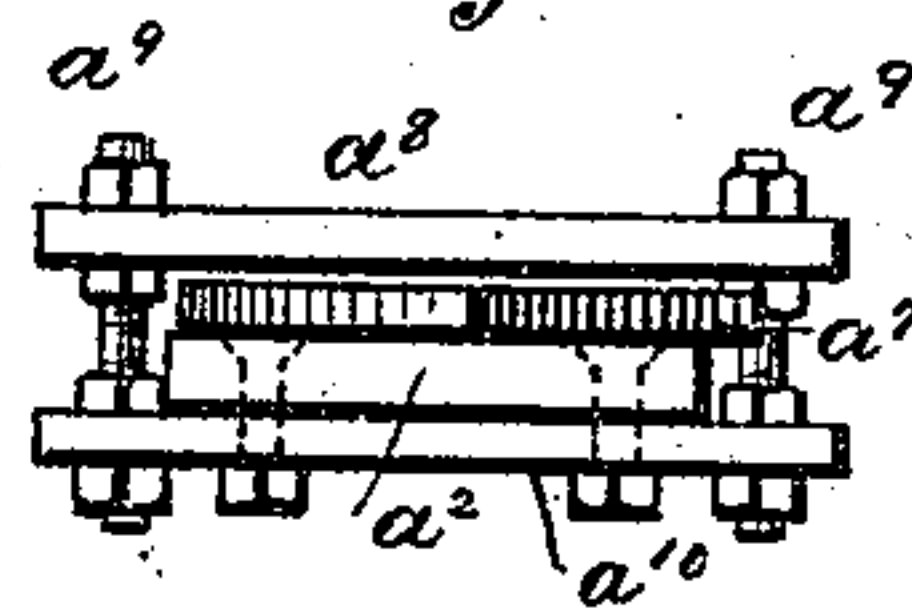


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM LESTER LELAND, OF OROVILLE, CALIFORNIA.

TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 355,940, dated January 11, 1887.

Application filed May 21, 1886. Serial No. 202,919. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM LESTER LELAND, of Oroville, in the county of Butte and State of California, have invented a new and
5 useful Improvement in Traction-Engines, of which the following is a specification.

My invention relates to traction-engines; and its principal features of novelty consist in mounting separate engines upon the truck-
10 frame for the front and back wheels, which engines are only connected to the boiler by flexible pipes, and combining said truck-frames with a central steering-gear, whereby both truck-frames are equally and simultane-
15 ously turned.

It also consists in other features of improvement in detail, which I will more fully describe hereinafter.

In the drawings, Figure 1 is a vertical longitudinal section of the engine. Fig. 2 is a
20 plan view of the running-gear. Fig. 3 is a rear end elevation; Fig. 4, a vertical transverse section, and Figs. 5 and 6 are details.

A and B are two equal truck-frames, whose
25 adjacent ends are arcs of circles struck from their centers above the two axles. These truck-frames are each mounted at one end upon the axles A⁵ and B⁵, and their inner ends are connected to the boiler I and supported
30 by chains Q Q. Upon each of these truck-frames is mounted an independent engine, A' and B', which transmit their power, respectively, to the cog-gears A² and B², and which, operating upon the gear-teeth A³ and B³ on
35 the front and rear wheels, A⁴ and B⁴, impart to the latter a positive and independent motion. It will thus be seen that the front and back wheels are independently driven by separate engines, and these engines are not directly
40 connected with nor mounted upon the boiler, but simply receive steam from the flexible pipe *a* and exhaust it through *a'*.

The supply-pipes *a* and *b* are made flexible to compensate for the motion between the
45 boiler and the running-gear upon which the engines are mounted, and said flexible pipes connect with the pendent branches C' C² from the horizontal steam-pipe C, that runs longitudinally along the top of the steam-boiler.
50 This horizontal steam-pipe C connects at one

end of the boiler with a steam-dome, D, through throttle-valve E and operating-rod F, and at the other end of the boiler with another steam-dome, D', through throttle-valve E' and operating-rod F', by which arrangement steam
55 can always be taken from the high end of the boiler, no matter whether going up or down hill, thus always insuring dry steam for the engine.

To the bottom side of the boiler, near its
60 middle and depending therefrom, there is attached a bracket or frame, P, in which is journaled a horizontal transverse screw-shaft, L, bearing at one end a chain-wheel, K, that connects with a chain, J, that runs to the hub of
65 a hand-wheel, R, by which the chain is operated and the shaft L turned. This shaft is provided near its middle with screw-threads which pass through and mesh with the threads of an internally-threaded block, M,
70 from which there depends a lug, N, that passes down into and rests partly in a slot, O, in the curved edge of frame A and partly in another coinciding slot in the other frame, B. As the
75 hand-wheel R is turned, it will be seen that it rotates shaft L and causes the threaded block M to traverse the shaft transversely to the boiler, and as its lug N is loosely locked into the slots O of the frames A and B it carries these
80 truck-frames with it, causing them to move about their vertical centers above the axles, and thus furnishing means for steering the engine and turning to the right or left in a very small space.

The forward part of the boiler is provided
85 on its under side with a vertical sleeve, *b*⁴, which slides over a pin, *b*⁶, attached to a cup, *b*³, which latter is jointed to the forward bolster, *b*², by a horizontal bolt, *b*⁷, which permits the boiler to rock slightly from side to
90 side, while a spiral spring, *b*⁵, wound around sleeve *b*⁴, bears at its lower end on the cup *b*³ and at its upper end against the boiler, so as to sustain the weight of the boiler in an elastic manner.

G is the injector boiler-feed, whose pipes G'
95 leads the one from the water-tank H and the other to the boiler, both passing in transit through the smoke-box, so as to heat the feed-water.
100

G² is a valve in a steam-pipe leading from the forward steam-dome into the smoke-stack for the purpose of creating a draft.

The rear end of the boiler has a plate, *a*¹¹, 5 that bears upon the bolster *a*², and is connected to it by a vertical pivot-bolt, *a*⁶. This bolster *a*² is sustained upon springs *a*³, wound around rods *a*⁴, *a*⁴, suspended from block *a*⁵, resting above the axle A⁵.

10 To permit a limited rotary motion to this end of the boiler around the pivot-bolt *a*⁶, the bottom plate, *a*¹¹, has wings or extensions *a*⁷ *a*⁷ on the sides, which extend through keepers formed by plates *a*⁸ and *a*¹⁰, Fig. 5, connected by bolts *a*⁹, and which plate *a*¹⁰ is secured to the under side of bolster *a*². The ends 15 or extension *a*⁷, it will be seen, have in these keepers a limited oscillation about the center pin, *a*⁶, in turning, and the top plates, *a*⁸, prevent the boiler from tipping over to one side 20 or the other.

Having thus described my invention, what I claim as new is—

1. The combination, in a traction-engine, 25 of front driving-wheels, rear driving-wheels, truck-frames mounted thereon, independent engines and cog-gearing mounted on said truck-frames and connecting with the driving-wheels, and flexible steam-pipes connecting 30 the engine with the boiler, substantially as described.

2. The combination, in a traction-engine, of the boiler, independent front and rear trucks,

with separate driving gear, a transverse screw-shaft, and a traversing nut or screw-block connected with the adjacent ends of the truck-frames for steering the engine, substantially as described. 35

3. The combination, with the boiler, of the two steam-domes D D', the steam-pipe C, connecting the two and having valves E E' and 40 operating-rods, the pendent branch pipes C' C², connecting with pipe C between the throttle-valves, the two independent trucks and their respective driving-gears, and engines connected to the pendent pipes C' C² by flexible 45 pipes *a*, substantially as described.

4. The combination, with the rear bolster, of the boiler mounted thereon by a vertical axis and having extensions *a*⁷ *a*⁷, and keepers, 50 substantially as described, for holding said extensions against excessive motion, as set forth.

5. The combination of the front axle, B⁵, the bolster *b*², cap *b*³, with pin *b*⁶, horizontal bolt *b*⁷, sleeve *b*⁴, and spring *b*⁵, encircling the 55 tube and seated on the cup and bearing at its upper end against the boiler, substantially as described.

The above specification of my invention signed by me in the presence of two subscribing witnesses. 60

WILLIAM LESTER LELAND.

Witnesses:

EDW. U. BYRN,
 SOLON C. KEMON.