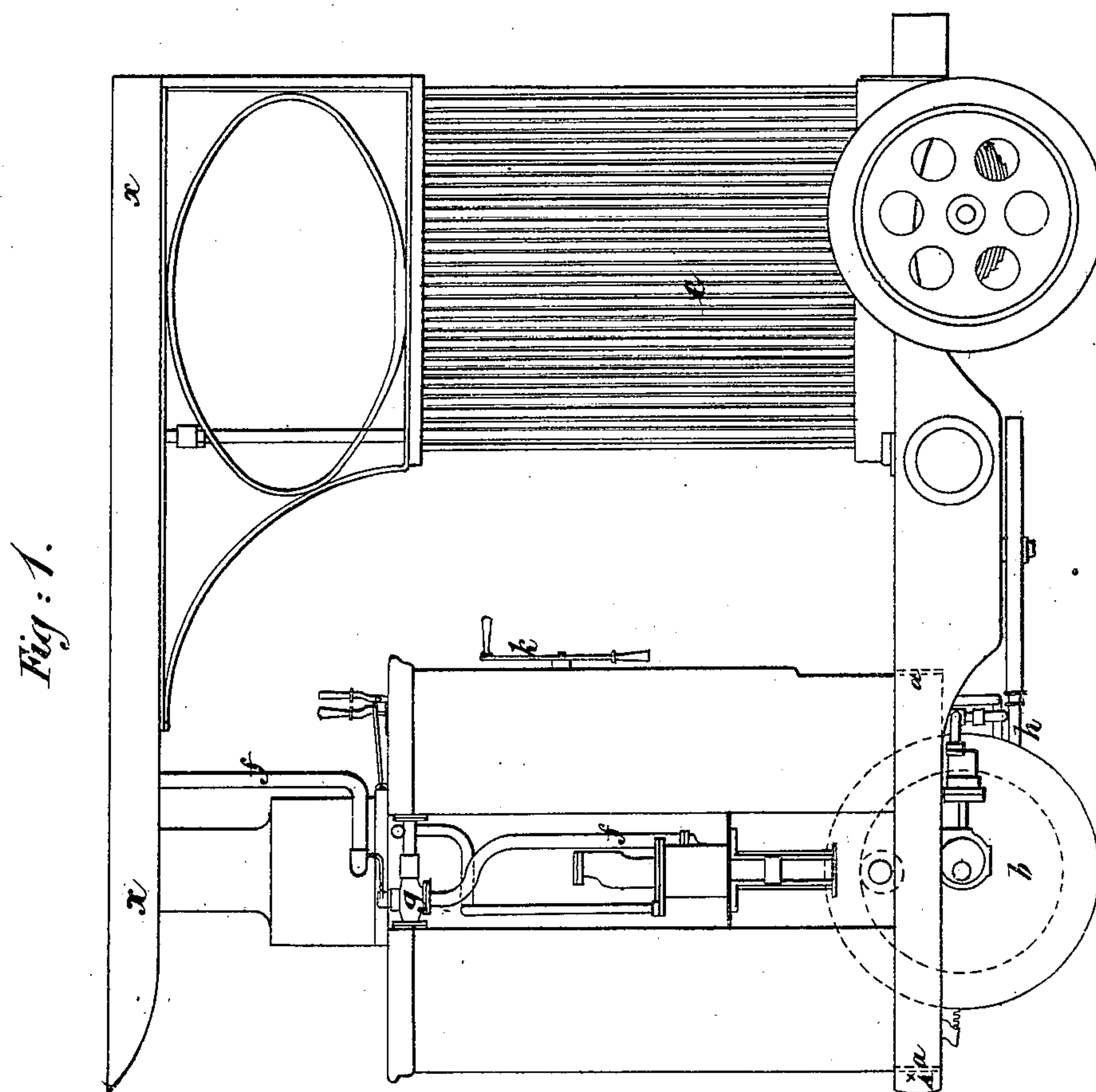


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**L. PERKINS.**  
**Traction Engines.**

No. 143,028.

Patented September 23, 1873.



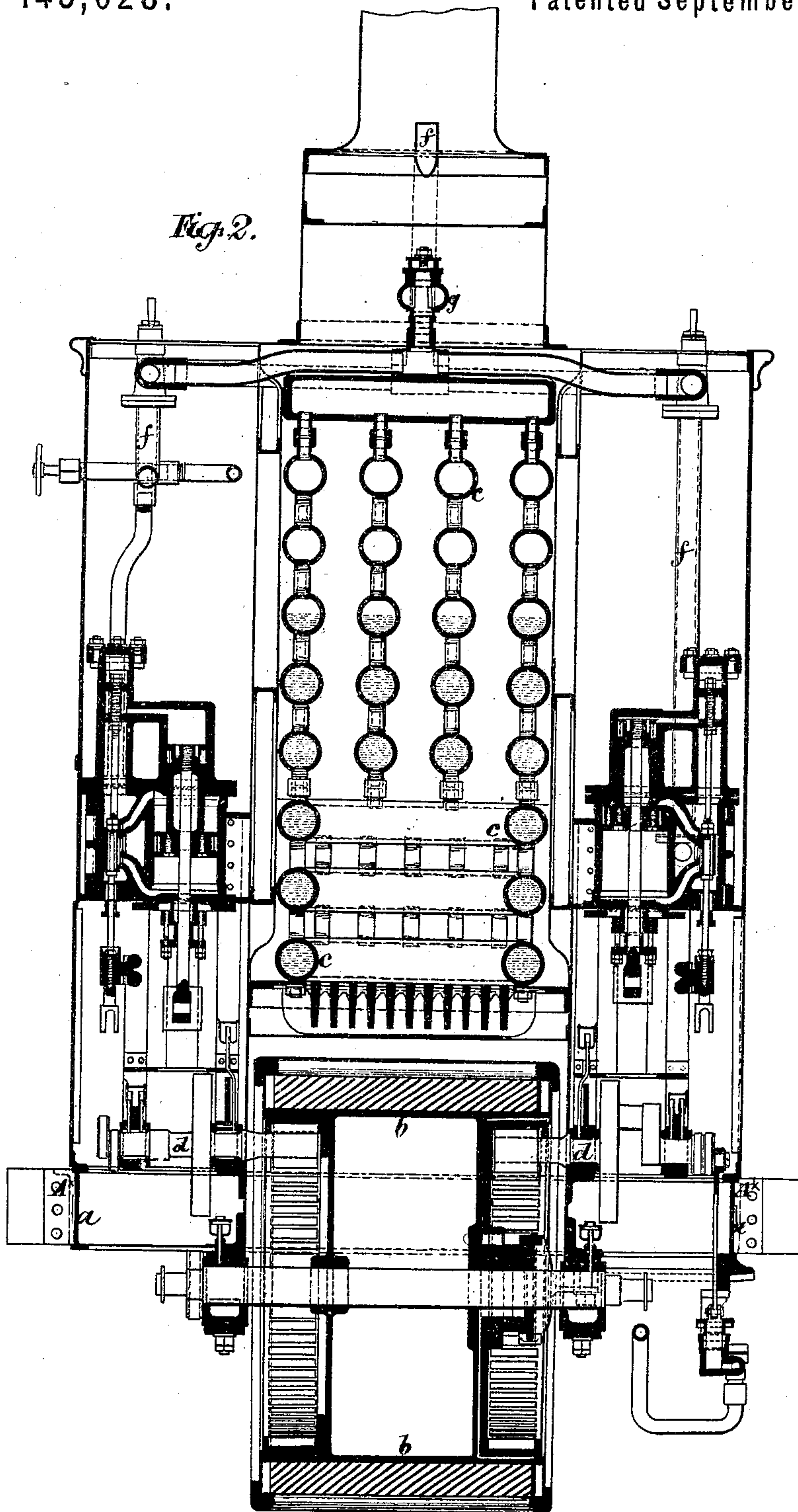
Witnesses;  
Geo. Pitt  
D. Carmael

Inventor:  
 Loftus Perkins

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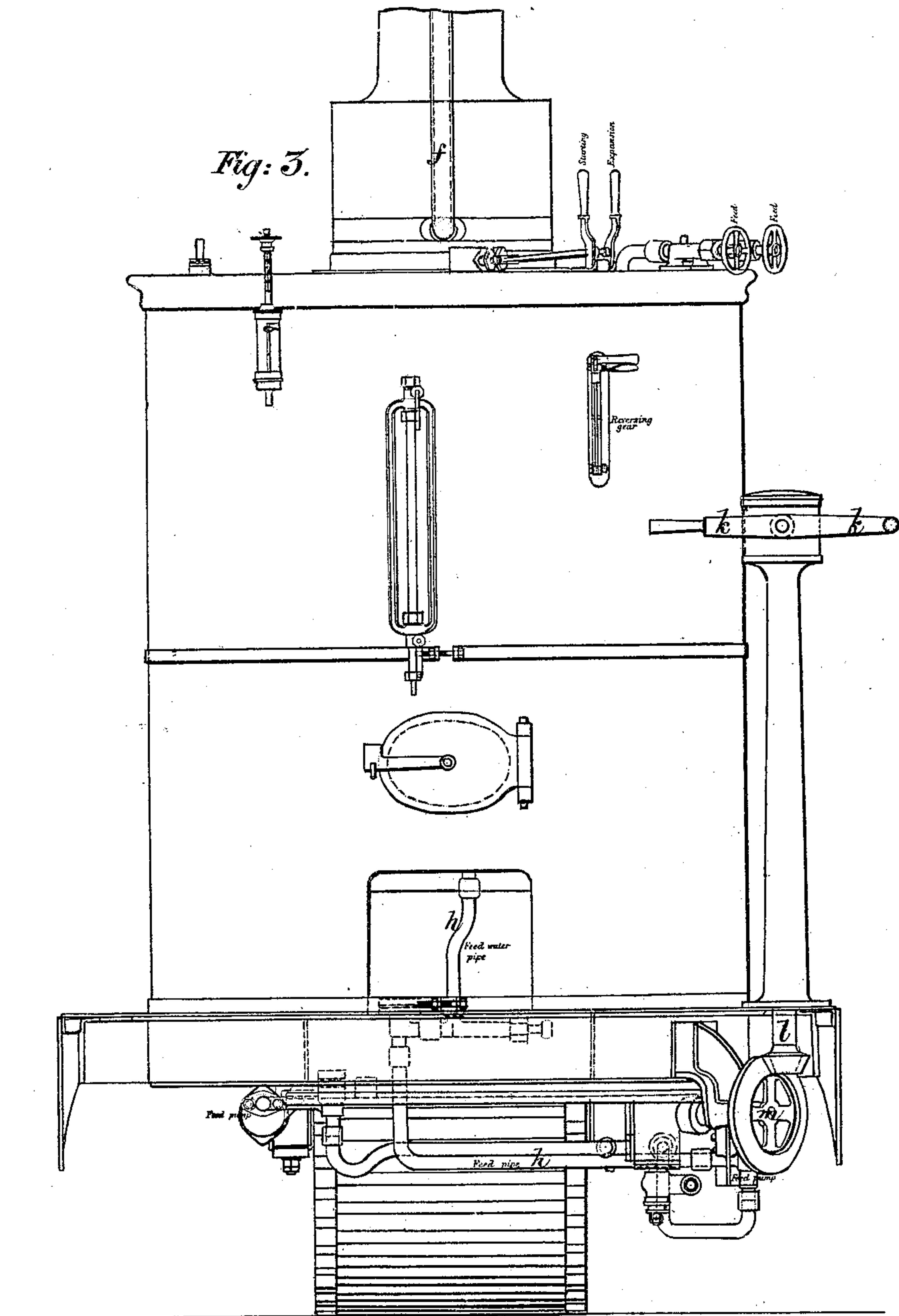
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*Geo. Pitt*  
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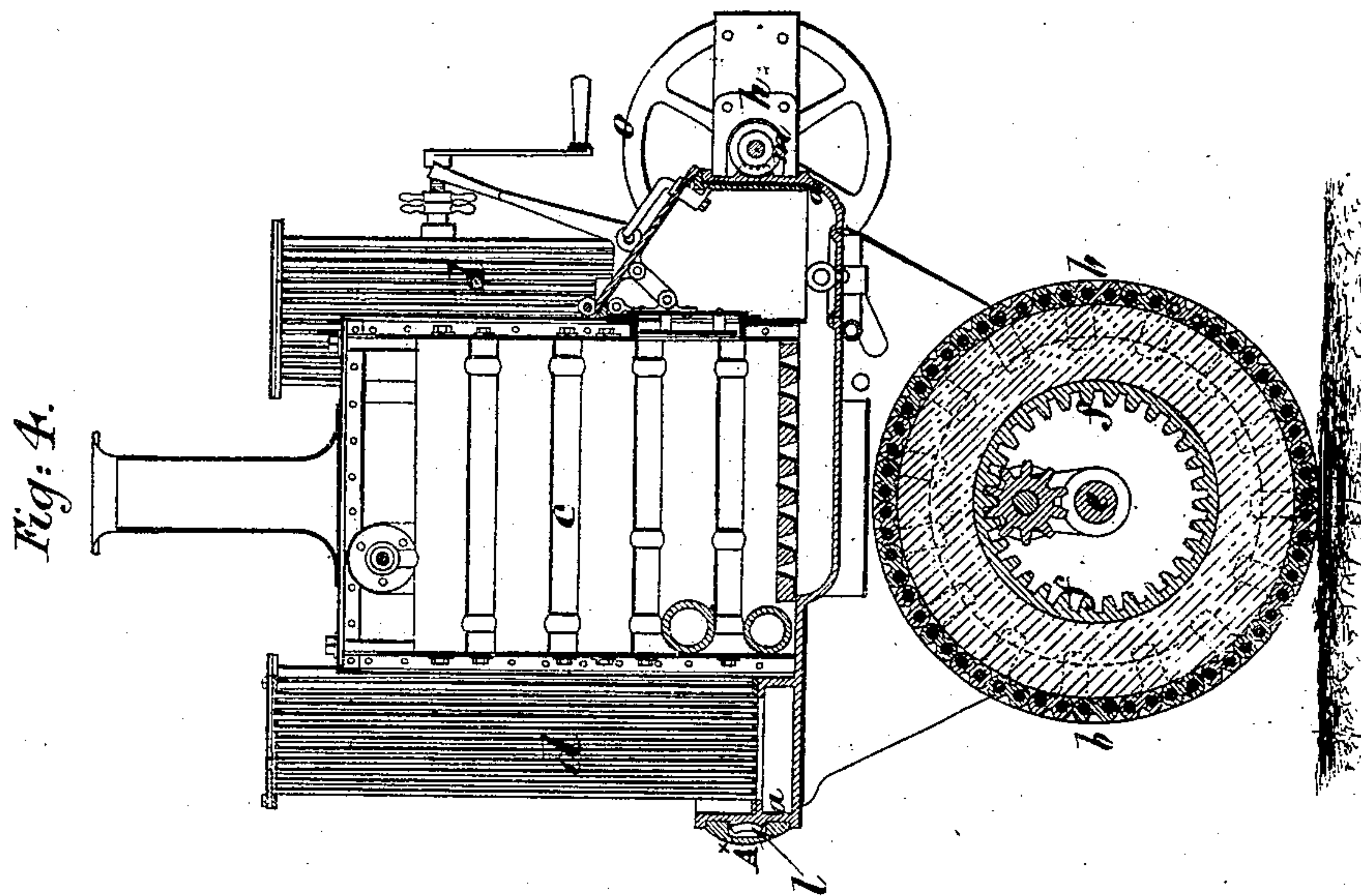
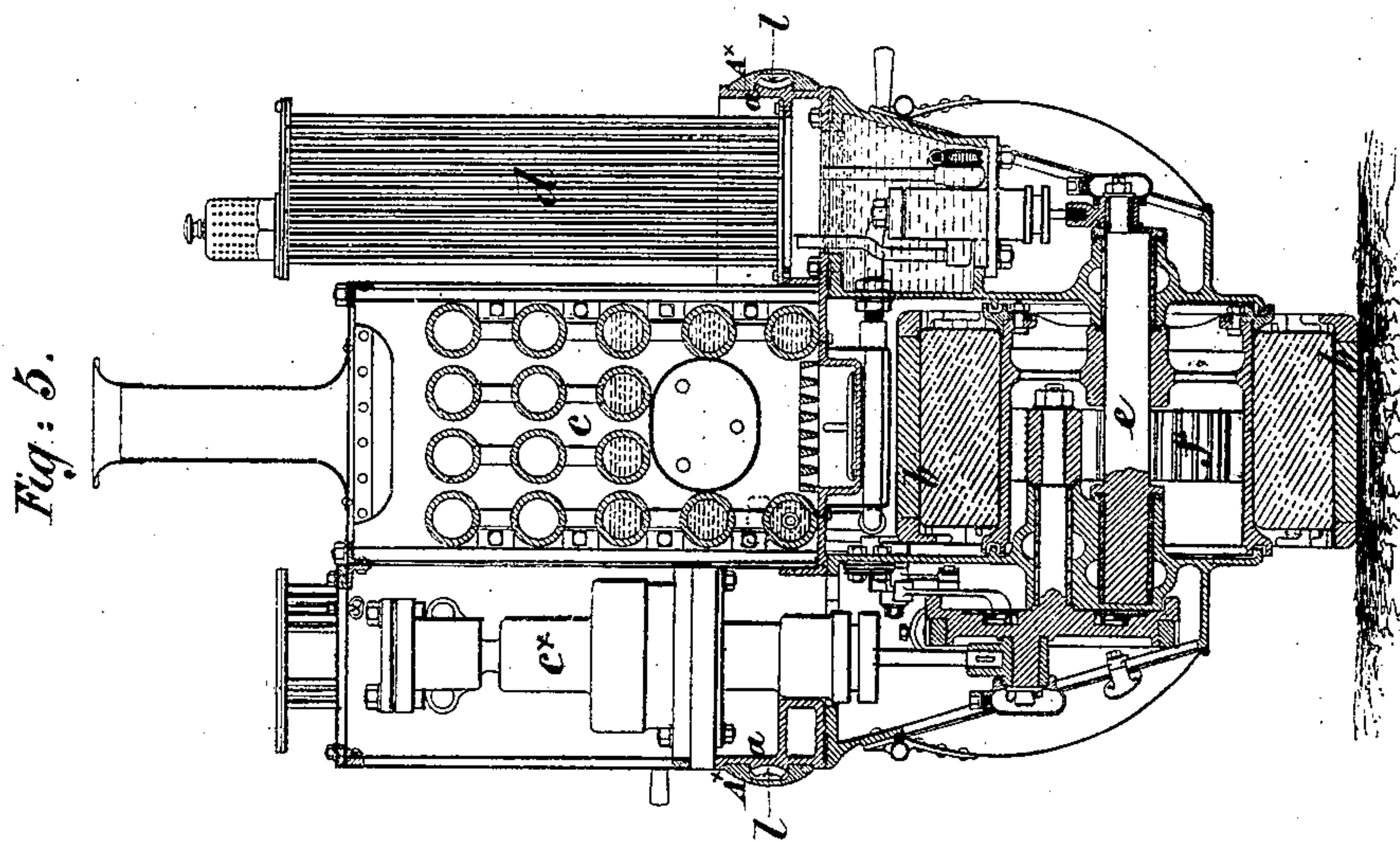
*Inventor*  
*L. Perkins*



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Geo. Pitt  
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Inventor,  
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# UNITED STATES PATENT OFFICE.

LOFTUS PERKINS, OF SEAFORD STREET, GRAY'S INN ROAD, ENGLAND.

## IMPROVEMENT IN TRACTION-ENGINES.

Specification forming part of Letters Patent No. **143,028**, dated September 23, 1873; application filed January 21, 1873.

*To all whom it may concern:*

Be it known that I, LOFTUS PERKINS, of Seaford street, Gray's Inn Road, in the county of Middlesex, England, a citizen of the United States of America, have invented or discovered new and useful Improvements in Locomotive or Traction Engines; and I, the said LOFTUS PERKINS, do hereby declare the nature of the said invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof—that is to say:

In constructing a locomotive or traction engine, according to my invention, I mount the boiler steam-engine, and, also, in some cases, an air surface-condenser, upon a horizontal circular frame embraced by a horizontal ring, within which it is capable of being revolved. The circular frame is supported on one broad central driving-wheel, which forms the driving-wheel, and the boiler-engine and condenser, if there be one, are balanced approximately around the wheel. The ring within which the circular frame turns may either be formed at one end of a carriage-frame, or the ring may be provided with short arms or shafts, by which it may be attached to a carriage. When the ring forms part of a carriage-frame the carriage-frame may have mounted upon it the air-surface condenser for condensing the exhaust steam from the engine. The steering or guiding of the engine is effected by turning it in the ring which encircles it, and this may be effected by a worm and worm-wheel, or by other arrangement of gearing. Locomotive or traction engines with more than one driving-wheel may also be similarly constructed, so that each driving-wheel, with its driving-gear, steam-engine, and boiler, may be capable of turning in a horizontal ring on the framing of the machine. At Figures 1, 2, and 3 of the drawings annexed I have shown a locomotive or traction engine, such as is above described, in which the boiler-engine and driving-gear are carried upon a circular frame embraced by a horizontal ring at one end of a carriage-frame, which carries an air-surface condenser.

Fig. 1 is a side view, Fig. 2 a transverse vertical section, and Fig. 3 a front view, of the engine.

*a* is the circular frame, mounted on one broad wheel, *b*, which has an elastic tire around it, protected by a chain of metal links, as shown; other forms of elastic tire might, however, be used. *c* is a steam-boiler, carried by the circular frame *a*. On the two opposite sides of this boiler are two separate compound engines, working downward onto their crank-shafts *d*. The crank-shaft *d* of each engine has upon it a pinion gearing into an internal ring of teeth at the side of the wheel *b*. The ring of teeth at one side can be disconnected from the wheel, so that the engine on that side can be employed for pumping water into the boiler while the traction-engine or locomotive is standing. In each of the engines the down stroke is made by high-pressure steam admitted at the top of the smaller cylinder, and by the expansion of steam (previously exhausted from the small cylinder) into the annular space above the piston of the low-pressure cylinder, while the up stroke is made by the expansion of steam on the under side of this piston. *A*\* is the horizontal ring, embracing the circular frame *a*. This horizontal ring forms one end of the frame of the locomotive or traction engine. The opposite end of this frame is supported on a pair of bearing-wheels, one on each side, and carries a tubular air-surface condenser, *e*. The exhaust steam from the low-pressure cylinders of the engines passes by the pipe *f*, first into a hollow roof, *x*, of thin sheet metal, and from there to the tubular condenser. On the pipe *f* is a swivel-joint, *g*, which is situated on the central vertical line of the circular frame *a* and boiler, in order to allow of this frame being turned for the purpose of steering. The feed-water pipe *h* is similarly provided with a swivel-joint; but, as this joint cannot (on account of the wheel) be on the central vertical line of the frame *a*, the feed-water pipe is also provided with a telescopic joint, as shown at Fig. 1. On the exhaust-pipe from each cylinder is a three-way cock, by which the exhaust can at any time be shut off from the condenser and introduced into the chimney as a blast.

The steering-gear, by which the circular frame *a* can be turned within the ring which embraces it, is shown at Figs. 1 and 3. *k* is



the steering-handle, having on its axis a bevel-wheel gearing into a wheel on the vertical shaft *l*, which, at its lower end, drives a horizontal shaft, *m*, upon which is a pinion gearing into the teeth of a circular rack on the under side of the frame *a*. This circular rack need not be carried entirely around the frame, but only around so much of it as is necessary to obtain the requisite amount of steering.

In place of employing a single central wheel two wheels placed side by side, and near to one another, might be employed, or two wheels of small diameter might be placed one behind the other, and be both embraced by an endless band or chain. The band may be of vulcanized india rubber or of other flexible material, or a metal chain may be used, and either bear directly on the ground, or be provided with flat bearing surfaces. With this arrangement both of the wheels would be driven by a pinion gearing into toothed wheels on the axes of the wheels.

I would state that I do not confine myself to any special construction of boiler, steam-engine, or condenser; but these parts, and the arrangement of gearing for giving motion to the driving-wheel, may be greatly varied, so long as the steam-engine, boiler, and driving-gear are mounted on a circular frame capable of being caused to turn within a horizontal ring, as above described.

Another mode, before alluded to, of embodying the invention is represented at Figs. 4 and 5 in this modification. The condenser is mounted upon the circular frame, and the horizontal ring *A*<sup>x</sup>, in place of forming part of a carriage-frame, is provided with short shafts, by which it may be attached to the shafts or other part of a separate carriage.

Fig. 4 shows a longitudinal section, and Fig. 5 a transverse section, of the locomotive or traction engine. In these figures, *a* is the circular frame, which is mounted on a single broad wheel, *b*, surrounded by an elastic tire.

*c* is the steam-boiler, carried by the frame *a*. *c*<sup>x</sup> is a steam-engine, for driving the wheel *b*, and *d* a tubular air-surface condenser. The wheel *b* is driven from the crank-shaft *e* of the engine by a pinion on the crank-shaft gearing into an internal ring of teeth, *f*, around the interior of the wheel. *A*<sup>x</sup> is the horizontal ring, embracing the circular frame *a*. On the ring are shafts *h*, by which it can be attached to the shaft or other part of any wagon or vehicle which it may have to draw. Around the periphery of the circular frame is a ring of teeth, *l*, into which gears a screw or worm, *m*, having on its axis a hand-wheel, *o*, so that by turning this hand-wheel the circular frame can be revolved within the ring, and thus the traction-engine can be steered in any desired direction.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that what I claim is—

1. The combination of the circular frame, the boiler and engine mounted thereon, the central driving-wheel which supports the circular frame, the main carriage-frame, and the horizontal ring rigidly secured to the main carriage-frame and connecting the circular frame and main carriage-frame, the whole constructed to operate substantially as before set forth.

2. The combination of the circular frame, the boiler and engine mounted thereon, the central driving-wheel which supports the circular frame, the main carriage-frame, the condenser mounted upon the said main carriage-frame, and the horizontal connecting-ring rigidly secured to the main frame, the whole constructed to operate substantially as before set forth.

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