

(No Model.)

2 Sheets—Sheet 1.

A. T. BALLANTINE.

OILING APPARATUS FOR VERTICAL ENGINES.

No. 310,018.

Patented Dec. 30, 1884.

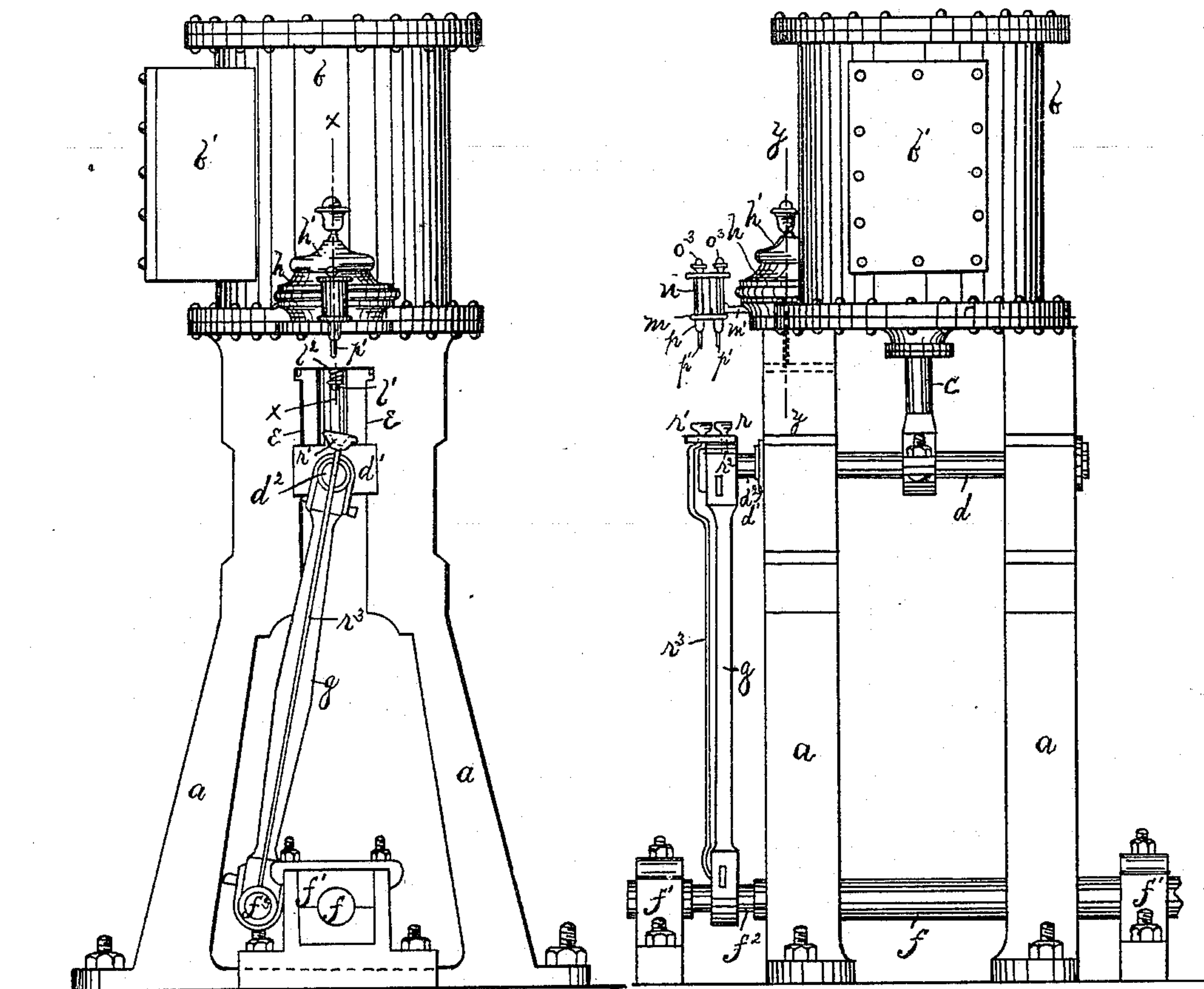


Fig. 1.

Fig. 2.

Witnesses:

Otto Hoddick.

A. Frank Nickson.

Inventor.

Alexander T. Ballantine

By W. T. Miller
Attorney.

(No Model.)

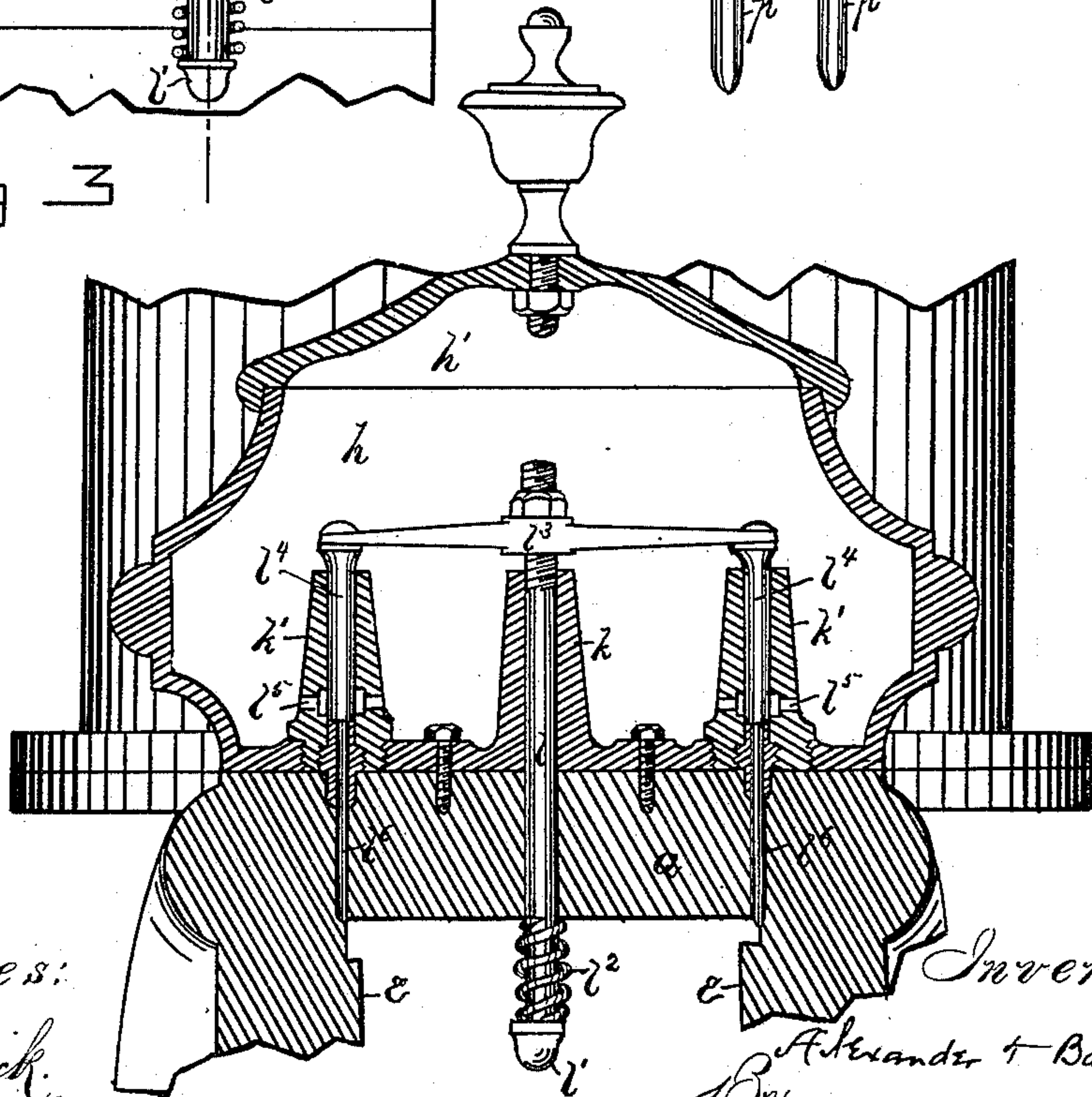
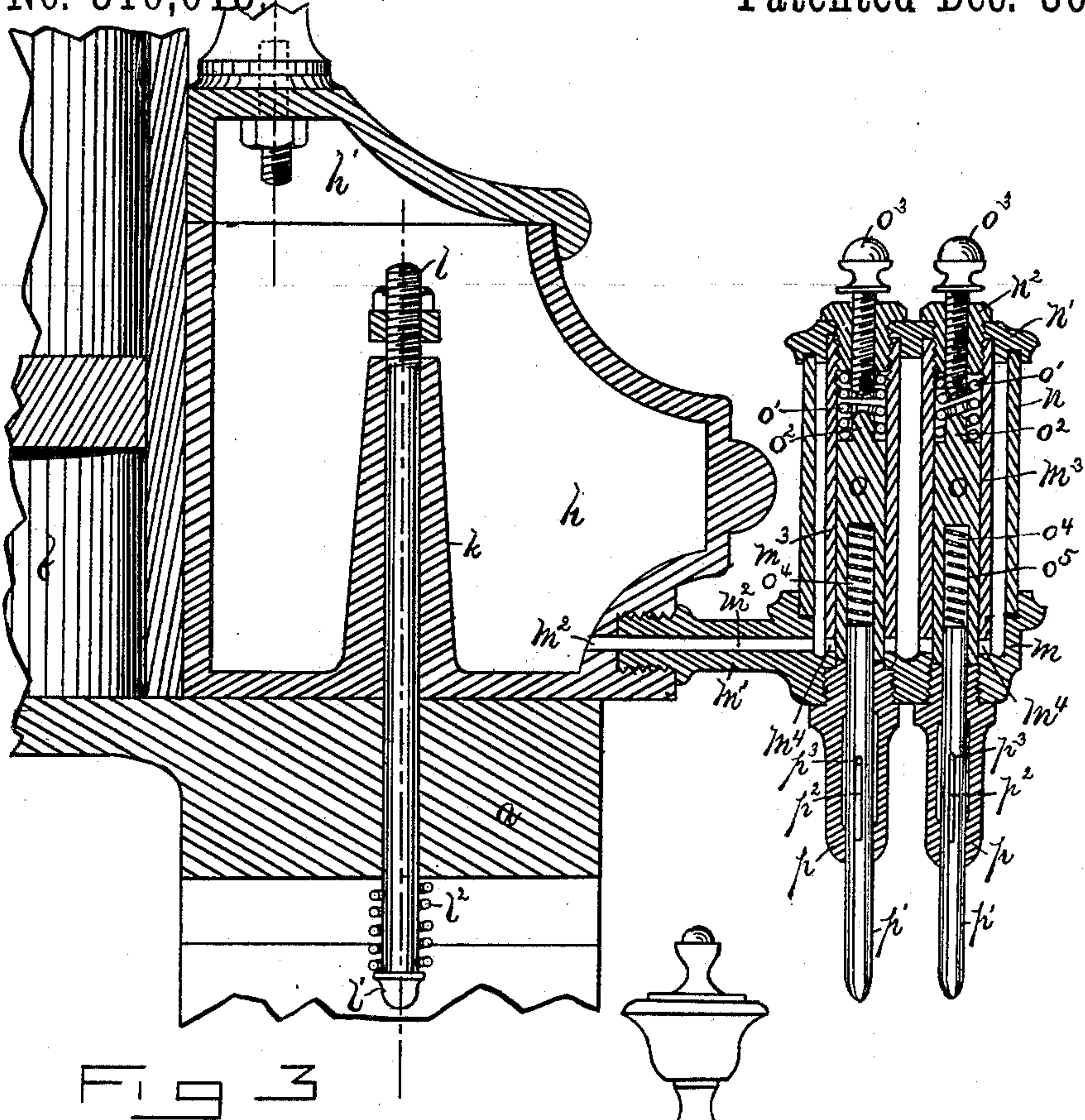
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Witnesses:

Otto Foddick.

A. Frank Vickers

FIG 4

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UNITED STATES PATENT OFFICE.

ALEXANDER T. BALLANTINE, OF GENEVA, OHIO, ASSIGNOR TO ELLA B. BALLANTINE, OF SAME PLACE.

OILING APPARATUS FOR VERTICAL ENGINES.

SPECIFICATION forming part of Letters Patent No. 310,018, dated December 30, 1884.

Application filed March 11, 1884. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER T. BALLANTINE, a citizen of the United States, residing at Geneva, in the county of Ashtabula and State of Ohio, have invented certain new and useful Improvements in Oiling Apparatus for Vertical Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates more particularly to apparatus for oiling certain movable parts of vertical engines; and it consists, substantially, of a novel and improved arrangement and combination of devices whereby the contacting surfaces of the guide-blocks and ways in which they travel and the movable journals are automatically supplied with the required amount of lubricating-oil at each stroke of the piston.

I will now proceed to more definitely describe the manner in which I have carried out my invention, it being understood that it is susceptible of considerable variation in its adaptation to the different styles of vertical engines without departing from the limits thereof.

In the drawings, Figure 1 is a side elevation of one form of vertical engine, showing the application thereto of my improved oiling apparatus. Fig. 2 is a front elevation of Fig. 1. Fig. 3 is a section taken on the line *x x* of Fig. 1, and Fig. 4 is a section taken on the line *y y* of Fig. 2.

Referring to the drawings, *a* is the frame-work of the vertical engine, which supports the cylinder *b* and steam chest *b'*.

c is the piston-rod, rigidly secured to the cross-rod *d*, which has a guide-block, *d'*, at each end, adapted to travel in the guideways *e e* in the frame *a*.

f is the shaft, suitably journaled in the bearings *f' f'*, and provided with the crank *f²*.

g is the pitman connecting the journal *d²* on the cross-rod *d* with the journal *f³* on the crank *f²* of shaft *f*.

The parts thus far described form an ordi-

nary type of vertical engine. Another pitman, *g*, and its accompanying parts, might be added on the other side of frame *a*, but the one shown is sufficient to illustrate the application of my improved apparatus, which has for its object to provide for automatically lubricating the guide-blocks *d'* in their ways *e e*, and the movable journals *d²* and *f³* at either end of the pitman *g*.

The vessel or reservoir for holding a quantity of the lubricant is shown located just over the ways *e e* and alongside of the cylinder *b*, and consists of the body portion *h* and removable cover *h'*.

Located upon and rising from the floor of the reservoir *h* is the central hollow standard, *k*, and the two side standards, *k' k'*. The side standards, *k' k'*, are located above and in line with the ways *e e*, as clearly shown in Fig. 4. *l* is a rod which passes down through the central standard, *k*, and frame *a*, and projects a short distance below such frame. It is provided with a knob or button, *l'*, at its lower end, between which and the frame *a* is the spiral spring *l²*. Its upper end is screw-threaded, and passes through a cross-beam, *l³*, having at each end the plungers *l⁴*, which pass down through the side standards, *k' k'*, to or nearly to their base.

Just above the lower ends of the plungers *l⁴ l⁴*, when in their normal position, as shown in Fig. 4, are the side passages, *l⁵ l⁵*, and below the plungers *l⁴*, and extending down through the frame *a* to the ways *e e*, are the small passages *l⁶ l⁶*.

The apparatus just described is intended for lubricating the ways *e e*, and is operated substantially as follows: The reservoir *h* is filled with the lubricant and held therein as long as the rod *l* and plungers *l⁴ l⁴* are in their normal position. When, however, the guide-block *d'* ascends with the piston-rod *c*, it strikes the button *l'* upon the rod *l*, forcing it upward against the action of the spring *l²*. The plungers *l⁴ l⁴* rise with the rod *l* above the line of the side passages, *l⁵ l⁵*, and allow a small quantity of the lubricant to pass into and down the small passages *l⁶ l⁶*, from whence it passes down into the ways *e e* on either side of the guide-block *d'*. As the guide-block *d'* descends the action of the spring *l²* causes the

plungers l^4 to assume their former position, thus preventing a further escape of the lubricant until the next stroke of the piston.

The apparatus for lubricating the movable journals d^2 and f^3 is arranged substantially as follows:

m (see Fig. 3) is a circular bracket, secured to the reservoir h by the arm m' , having the central passage, m^2 , leading into the reservoir h . Upon this bracket are located the vertical tubes m^3 , provided with the openings m^4 at their base. The vertical tubes m^3 , which are of metal, are inclosed in a glass cylinder, n , seated in the bracket m , and having a metallic cap, n' , over its upper end. The cap n' is held in position by the screw-bolts n^2 , which pass through the cap and screw into the vertical tubes m^3 .

o o are two plungers, located within the vertical tubes m^3 . These plungers o o , when in their normal position, extend below the openings m^4 in the vertical tubes m^3 .

o' o' are spiral springs placed in the tubes m^3 above the plungers o o , to hold them in their normal position. The upper ends of the plungers o o have the projections o^2 o^2 , which act in conjunction with the thumb-screws o^3 o^3 to regulate the throw of the plungers o o .

p p are two hollow depending projections in which the rods p' p' are adapted to be loosely reciprocated. These rods p' p' have the slots p^2 p^2 , through which pass the pins p^3 p^3 , which hold them from displacement in the projections p p , but at the same time allow of vertical reciprocation. The rods p' p' extend up a short distance into the recesses o^4 o^4 of the plungers o o , in which recesses are placed the spiral springs o^5 .

r r' are two oil-cups located upon the upper end of the pitman g , and in line with the two depending-rods p' p' .

From the oil-cup r a passage, r^2 , (shown in dotted lines in Fig. 2,) leads to the journal d^2 , and from the oil-cup r' a tube, r^3 , leads down along the pitman g to the journal f^3 at its lower end.

The operation of the device just described is as follows: The lubricant in the reservoir h flows through passage m^2 into the interior of the glass casing n , surrounding the tubes m^3 , and rising in the same to the level of that in the reservoir, thus permitting the glass casing n to serve as a gage, to indicate the amount of lubricant in the reservoir. When the cups r r' ascend with the upward stroke of the piston, they strike the lower ends of the rods p' p' . These rods are thrown up against the springs o^5 in the plungers o o , which serve to raise the plungers o o up past the opening m^4 in the tubes m^3 , thus allowing a small quantity of the lubricant to flow down around the loosely-fitting rods p' p' . By the time the cups r r' return in the next succeeding stroke of the piston to repeat the operation just described a drop of the lubricant will be collected upon each lower end of the rods p' p' . As the cups

r r' again touch the rods p' p' these drops of oil are taken up by the cups and conducted by their respective passages r^2 and r^3 to the journals d^2 and f^3 . This operation is repeated as often as there is a stroke of the piston. The spiral springs o' o' , against which the plungers o o are pressed in their upward thrust, are stronger than the springs o^5 o^5 within the plungers, and serve to return the plungers to their normal closed position, as shown in Fig. 3, after the cups r r' on the pitman g recede during the downward stroke of the piston. When it is found that the supply of oil to the journals is too great, the quantity can be decreased or shut off entirely for awhile by simply moving down the thumb-screws o^3 o^3 closer to the projections o^2 o^2 upon the plungers o o . When the quantity of oil to be fed is to be decreased, and when it is to be shut off entirely, the screws o^3 o^3 are moved down until they come in contact with the projections o^2 o^2 , when it will be impossible for the plungers o o to rise. Any jarring of parts in this event will be prevented by the spiral springs o^5 o^5 .

I claim—

1. As a means of lubricating the guideways of a vertical engine, a reservoir for holding the lubricant located above the guideways and provided with hollow standards suitably communicating with the surfaces of the guideways, a spring-pressed rod passing from the interior of the reservoir down to the open space between the guideways to a position where it can be raised by contact with the reciprocating guide-block, and plunger secured to and moving with the spring-pressed rod and within the hollow standard, all combined and operating to feed the lubricant to the guideways, substantially as shown and described.

2. As a means of lubricating the movable journals at each end of the pitman, connecting the guide-block with the crank of the shaft of a vertical engine, a reservoir for holding the lubricant, having within it the same number of vertical tubes as there are journals to be lubricated, such tubes being provided with openings at their bases into the reservoir, spring-pressed plungers within each vertical tube, spring-pressed rods whose upper ends extend a short distance within the spring-pressed plungers, and whose lower ends extend below the reservoir to a point where they can be raised by the reciprocating pitman to release the oil in the reservoir, and cups or receptacles upon the upper end of the pitman communicating with the journals at each end of such pitman, such cups being adapted to receive and transmit the oil to the journals, the whole combined and operated substantially as shown and described.

3. In a vertical engine, the reservoir h , with its described mechanism for lubricating the guideways, such mechanism being operated by the guide-blocks, and the adjacent attached glass reservoir n serving as a gage for the

reservoir *h*, and having within it the mechanism shown and described for lubricating the journals at either end of the pitman, such mechanism being operated by the pitman, the whole arranged and combined substantially as shown and described.

4. The combination, with the reservoir *h*, having the central hollow standard, *k*, and the side standards, *k'* *k'*, having the passages *l⁵* *l⁵* and *l⁶* *l⁶*, leading to the guideways *e* *e*, of the spring-pressed rod *l*, adapted to be operated by the guide-block *d'*, and provided with the cross-rod *l³*, and its plungers *l⁴* *l⁴*, working in the standards *k'* *k'*, substantially as shown and described, and for the purpose stated.

5. The combination, with the hollow bracket *m*, and reservoir *n*, having the vertical tubes *m³* *m³*, provided with the openings *m⁴* *m⁴* at their bases, of the spring-pressed plungers *o* *o*, and spring-pressed rods *p'* *p'*, having the slots *p²* *p²*,

through which the pins *p³* *p³* pass, substantially as shown and described, and for the purpose stated.

6. In combination, the hollow bracket *m*, and reservoir *n*, having the vertical tubes *m³* *m³*, provided with the openings *m⁴* *m⁴* at their bases, the thumb-screws *o³* *o³*, the plungers *o* *o*, with the projections *o²* *o²*, and recesses *o⁴* *o⁴*, the slotted rods *p'* *p'*, and the spiral springs *o'* *o'* and *o⁵* *o⁵*, the whole combined and operating with the pitman *g* to lubricate the journals at each end of such pitman, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALEXANDER T. BALLANTINE.

Witnesses:

J. FRED. BEHN,

W. T. MILLER.