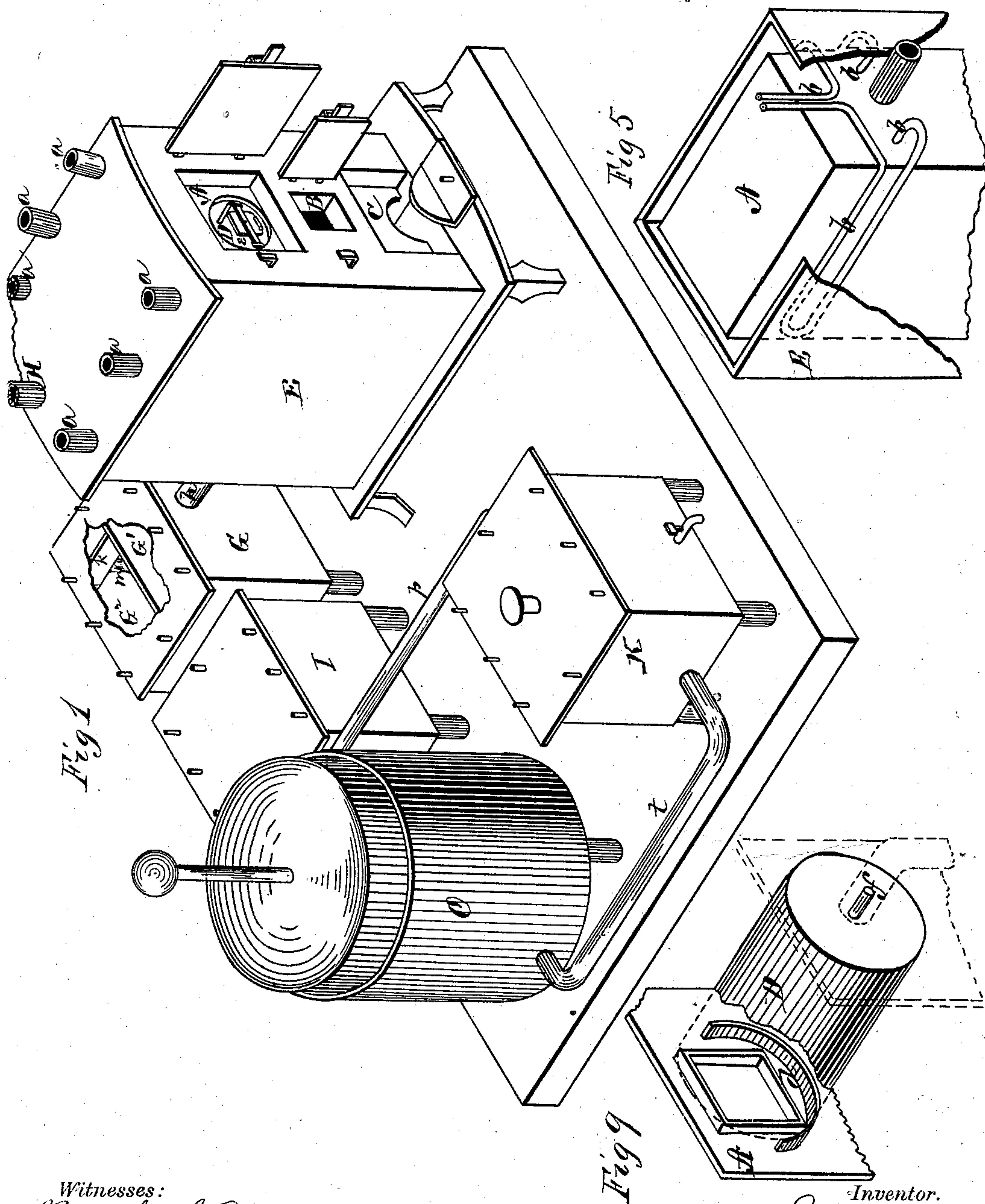


D. H. IRLAND.
Gas Generators.

No. 138,160.

Patented April 22, 1873.



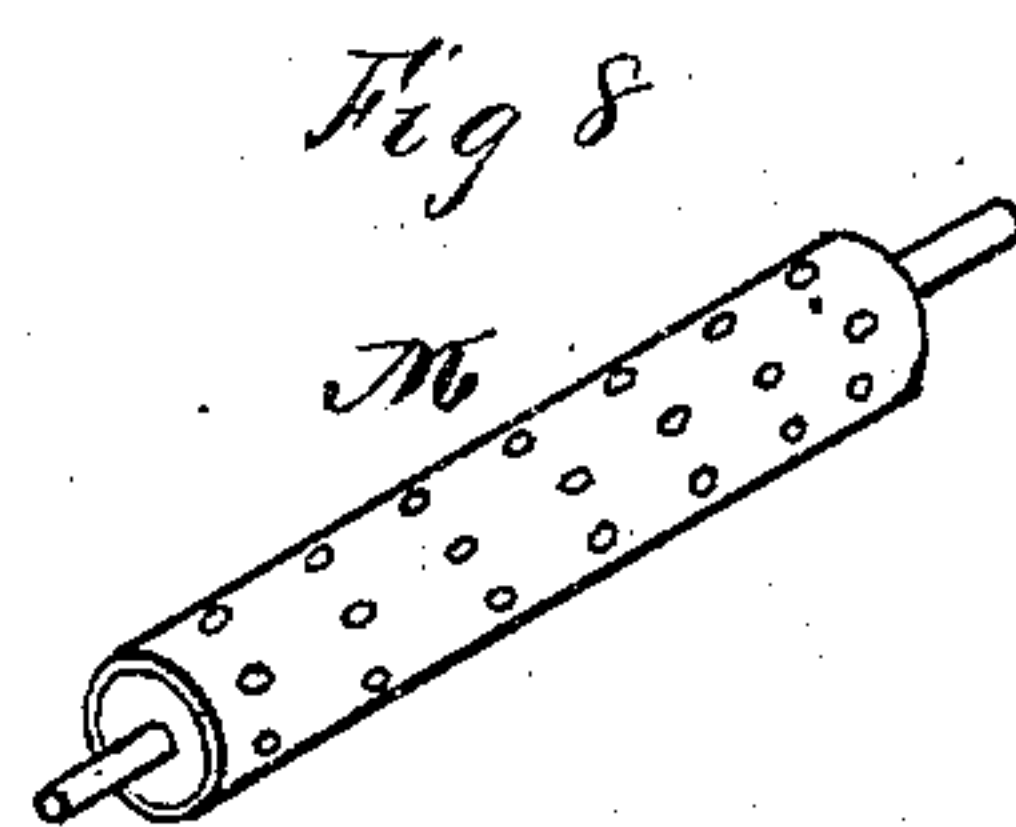
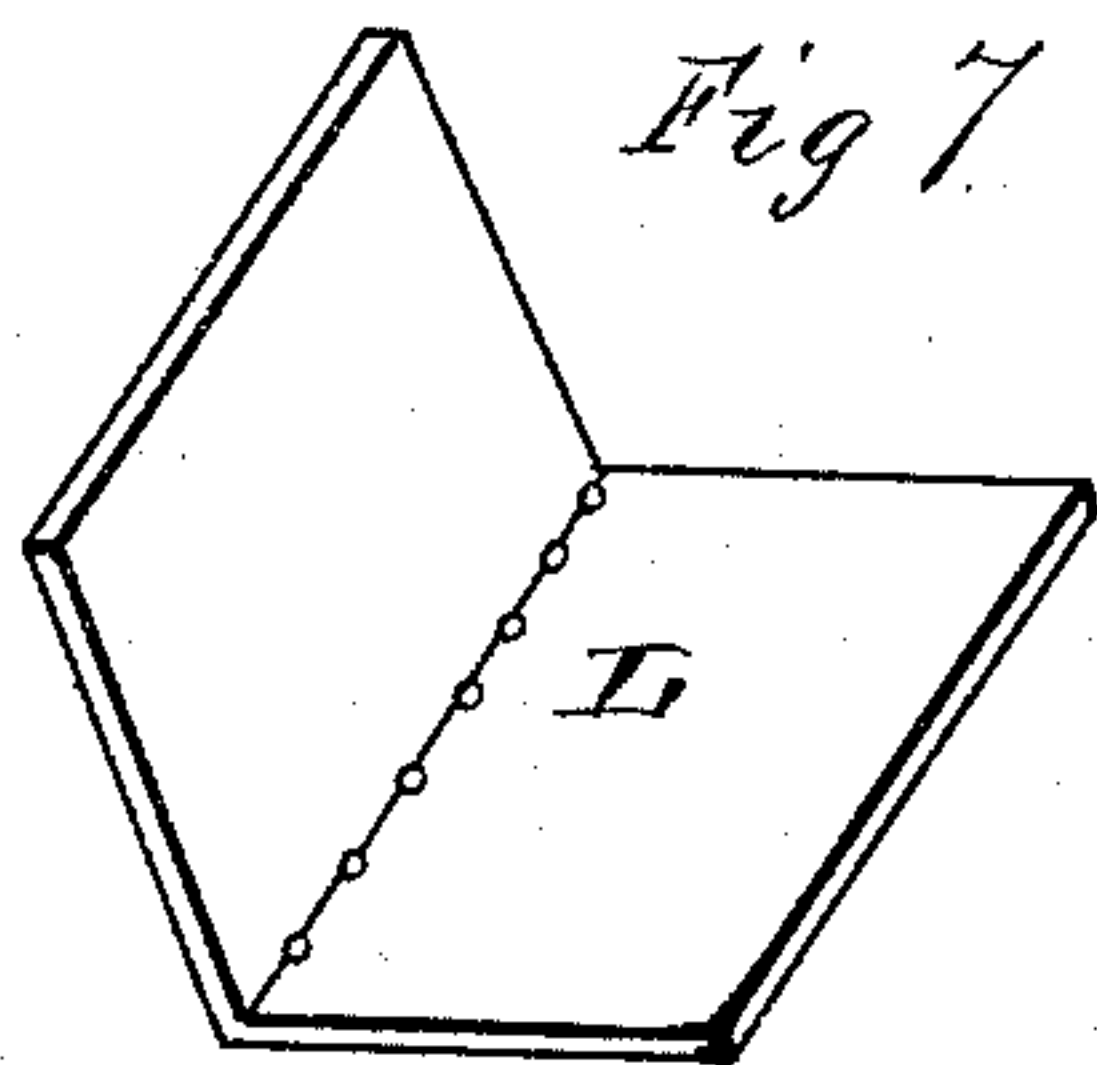
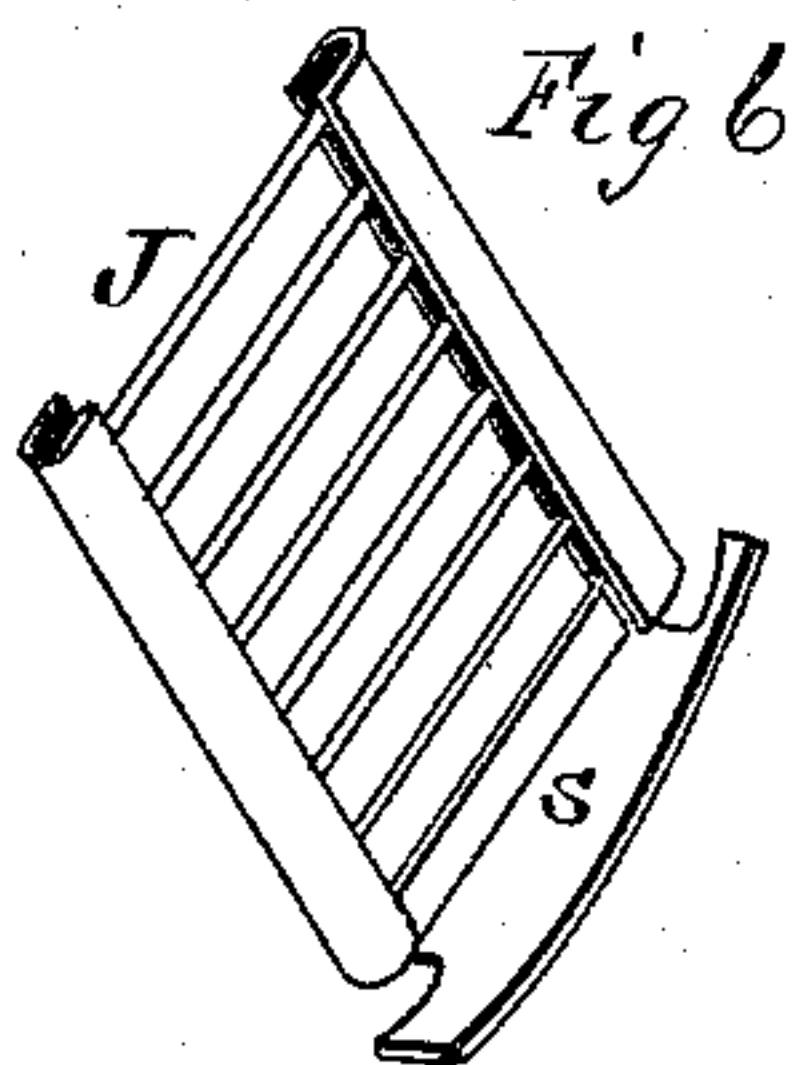
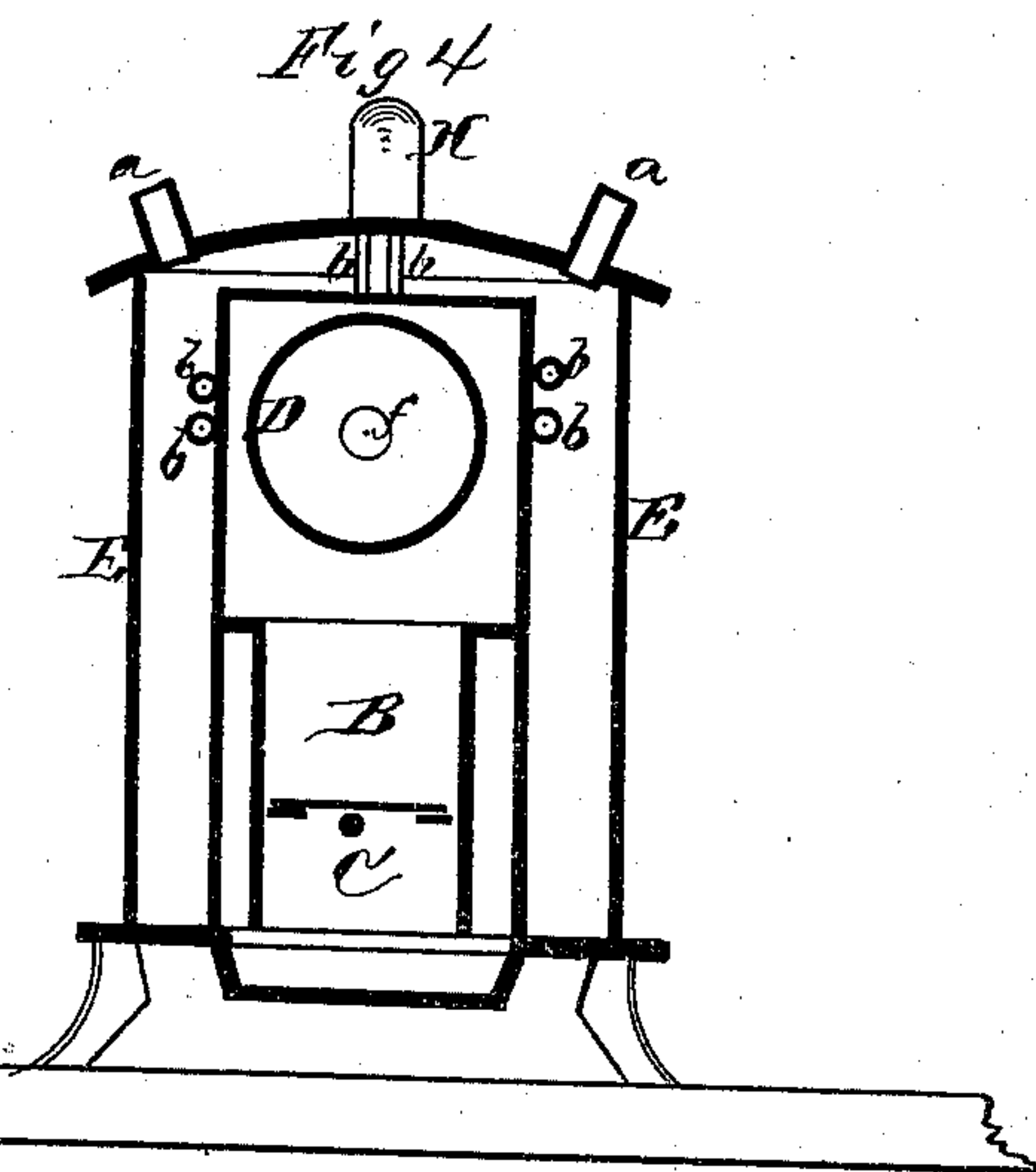
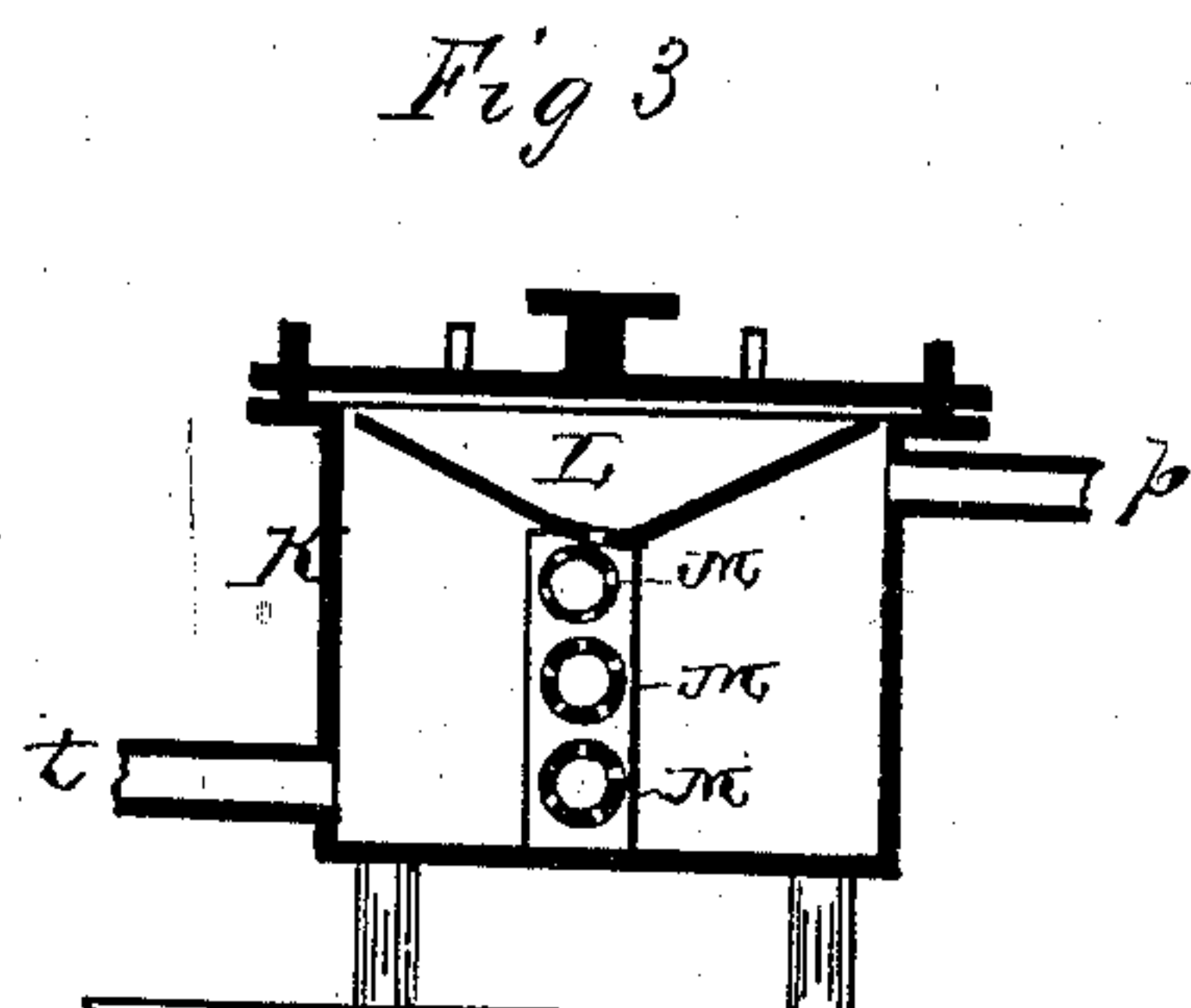
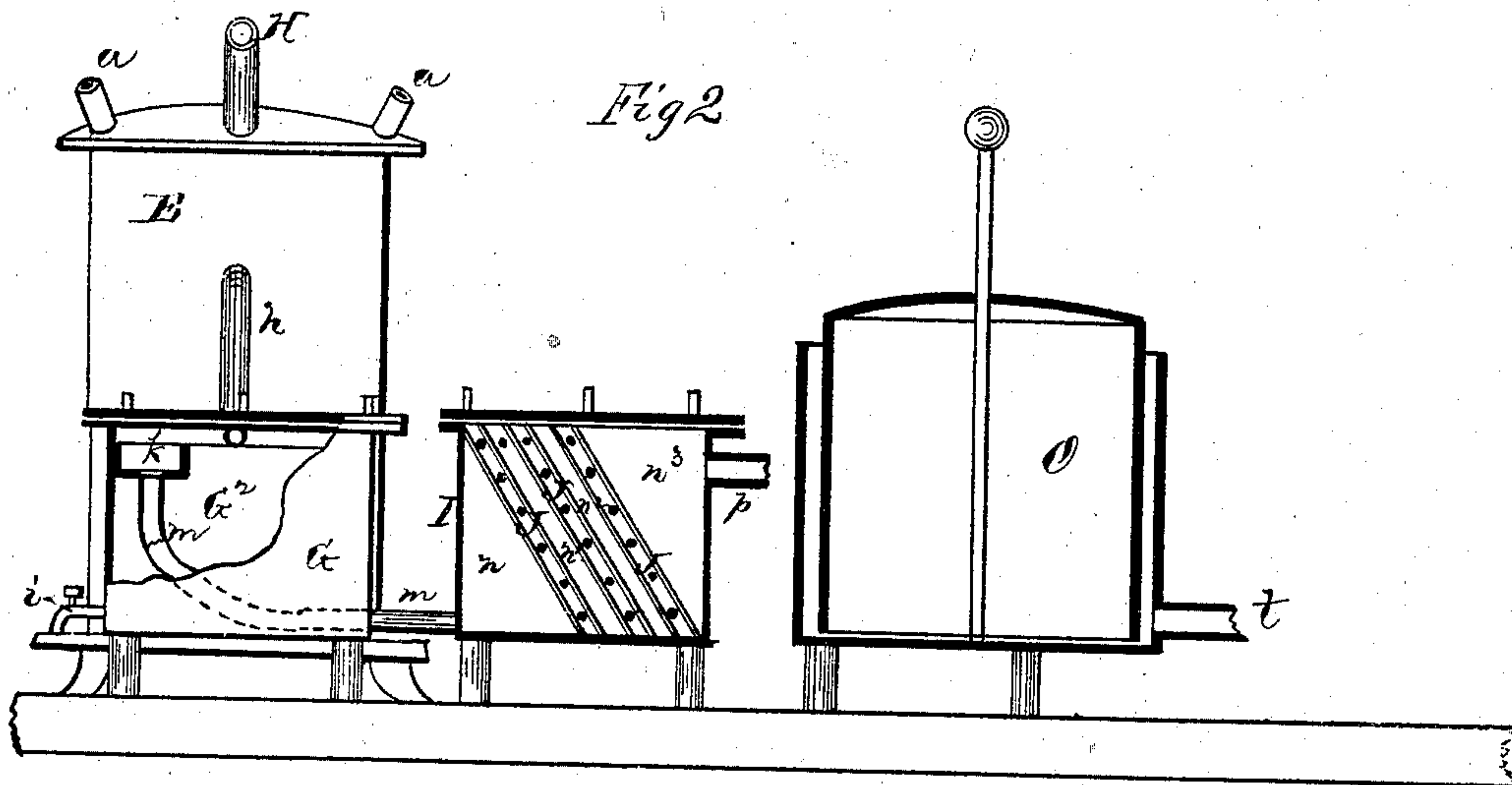
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UNITED STATES PATENT OFFICE.

DAVID H. IRLAND, OF HUDSON, MICHIGAN.

IMPROVEMENT IN GAS-GENERATORS.

Specification forming part of Letters Patent No. **138,160**, dated April 22, 1873; application filed March 21, 1873.

To all whom it may concern:

Be it known that I, D. H. IRLAND, of Hudson, in the county of Lenawee and in the State of Michigan, have invented certain new and useful Improvements in Gas-Generators; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon making a part of this specification.

The nature of my invention consists in a process for manufacturing illuminating-gas; and also in the construction and arrangement of the apparatus for the same, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a perspective view of my entire apparatus; and Figs. 2 to 9 are detached views of the various parts composing the same.

A represents a furnace of any suitable construction, having fire-chamber B and ash-pit C, and a retort, D, above the fire-chamber. The furnace A is surrounded by a shell, E, leaving a hot-air chamber between them, from which the heated air is carried out through the tubes *a a* for the purpose of heating the building where my gas-machine is used. The smoke and heat pass from the rear side of the furnace A near the top through pipes *b b*, which are returned along the outside of the furnace, within the hot-air chamber, and up through the exit-pipe H. The retort D is made in cylindrical form, with a man-hole, *e*, at the front end, as shown in Fig. 1. The front end of the retort is supported upon a semicircular flange, *d*, attached or formed on the inside at the front end of the furnace, and the rear end of the retort is supported by a hollow journal, *f*, passing through back part of the furnace. This allows of the retort D being revolved upon its bearings *d f*, so as to cause the same to be heated equally on all sides, thereby more thoroughly extracting all the gas from the coal in the retort. The revolving of the retort may be accomplished at intervals by hand, by means of a crank or

other convenient means; or a continuous revolving motion may be imparted to the retort automatically by any suitable means. From the retort D the gas and tar pass through the hollow journal *f*, and connecting-pipe *h* to a combined condenser and cooler, G. This vessel is by a vertical partition divided into a condensing-apartment, G^1 , and a cooling-chamber, G^2 , the pipe *h* entering at or near the top of the condensing-chamber G^1 . The cooling-chamber G^2 is to be filled, or nearly filled, with water, and in said chamber at the top is a box or funnel, *k*, from which a pipe, *m*, leads through the cooling-chamber and out through the same into the purifier I. The pipe *m*, within the cooling-chamber G^2 , may go direct across and out, or it may be tortuous or winding in any manner, as may be desired. The tar which accompanies the gas from the retort into the condensing-chamber G^1 accumulates in the bottom of the same, and may be drawn off whenever necessary by the faucet *i*, while the gas finds its way through the box or funnel *k* and pipe *m* into the purifier I, becoming cooled during its passage through said pipe *m*, the same being, as above described, surrounded by water. Within the purifier I are arranged three grates, J J, which stand at an angle of about forty-five degrees, as shown in Fig. 2. These grates divide the interior of the purifier into four parts or chambers, *n*, n^1 , n^2 , and n^3 . The first chamber *n* is where the gas enters through the pipe *m* at the bottom. This chamber is triangular, as shown, and is left vacant to be filled with gas. The second chamber n^1 , between the two first grates, is filled with whitening. The third chamber n^2 is filled with oyster-shells; and the fourth triangular chamber n^3 is filled with tan-bark. The gas passing through these successive layers becomes thoroughly purified, and passes out through a pipe, *p*, at or near the top of the last chamber n^3 . The grates J J are constructed, as shown in Fig. 6, of a series of horizontal rods, or bars attached to side bars which slide in suitable guides attached to the sides of the purifier, and each grate is at its lower end provided with a foot, *s*. The grates are placed in an inclined position to afford facilities for any dripping that may occur. When the gas

passes out through the pipe *p* it is ready for use, and may be conducted directly to the gasometer; but I conduct it to a vessel, K, in the upper part of which is a cap or funnel, L, consisting simply of two inclined planes, as shown in Fig. 7, with a series of small openings along the angle. Below these openings are two, three, or more small perforated cylinders, M, hung upon journals so as to revolve easily. The funnel L is filled with the residuum of petroleum, or other similar material, through the lid of the vessel K, and as it drops through the openings in the funnel onto the perforated cylinders M, and through the same, it forms a spray which is subjected to the action of the gas entering through the pipe *p*, whereby both the quantity and quality of the gas are materially increased. The gas then passes through the pipe *t* to the gasometer O, and from there in the usual manner to the burners.

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

1. The combination of the furnace A with exterior shell E and hot-air pipes *a a* and a revolving retort, D, substantially as and for the purposes herein set forth.

2. The arrangement of the smoke-pipes *b b*, as shown and described, along the sides of the furnace A, for the purposes herein set forth.

3. The combined condenser and cooler G, constructed as described, with the condensing-chamber G¹, having faucet *i* and the cooling-chamber G² with funnel *k* and pipe *m*, all substantially as and for the purposes herein set forth.

4. The purifier I, provided with grates J J placed in an inclined position, and three of the spaces thus formed filled respectively with whiting, oyster-shells, and tan-bark, substantially as and for the purposes herein set forth.

5. The perforated funnel L and perforated cylinders M M, arranged within the vessel K, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 19th day of March, 1873.

DAVID H. IRLAND.

Witnesses:

A. N. MARR,
C. L. EVERT.