F. W. WILLARD.

Coal Oil Apparatus.

No. 27,327. Patented Feb. 28, 1860.

Fig. 2.

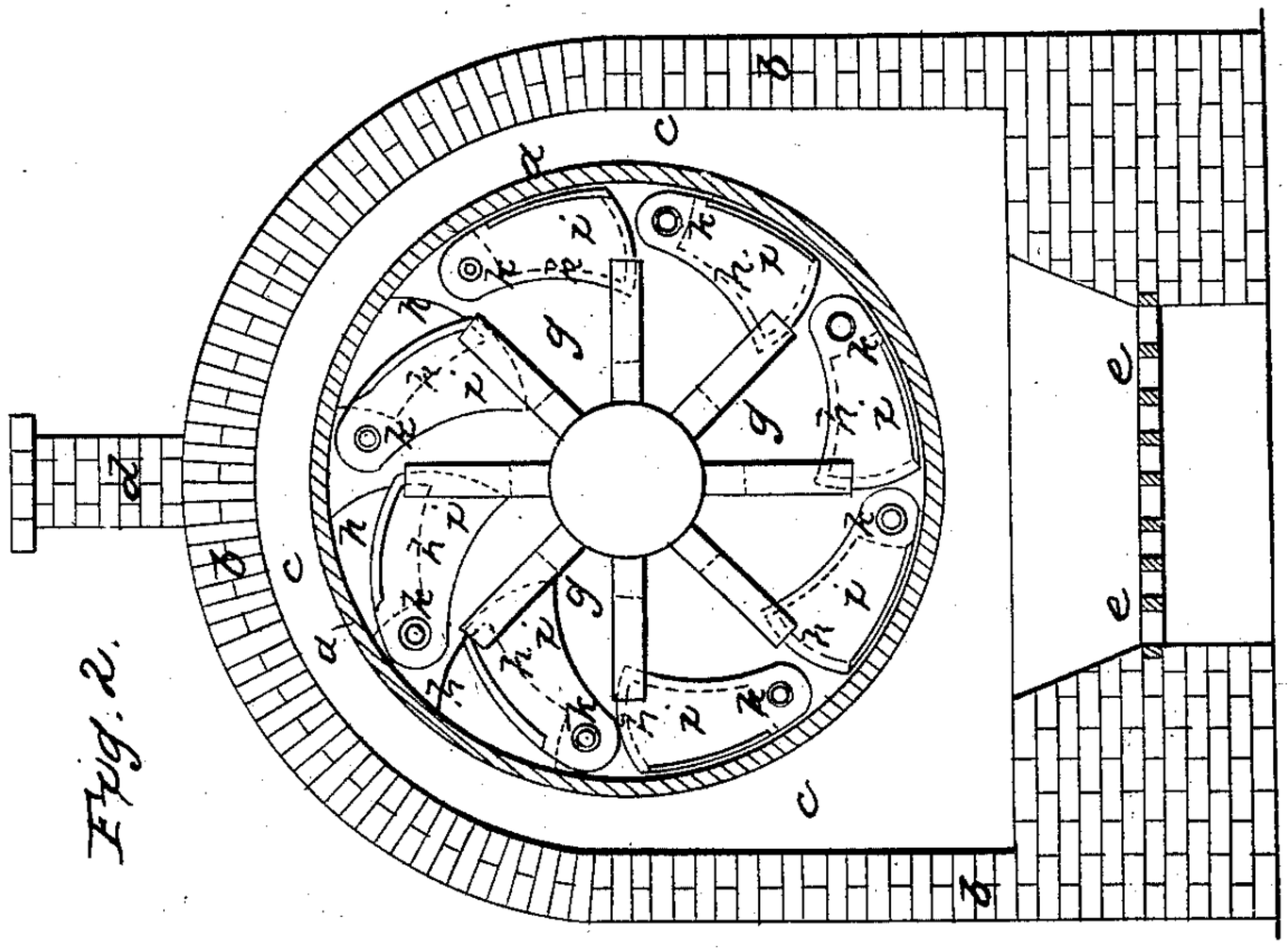
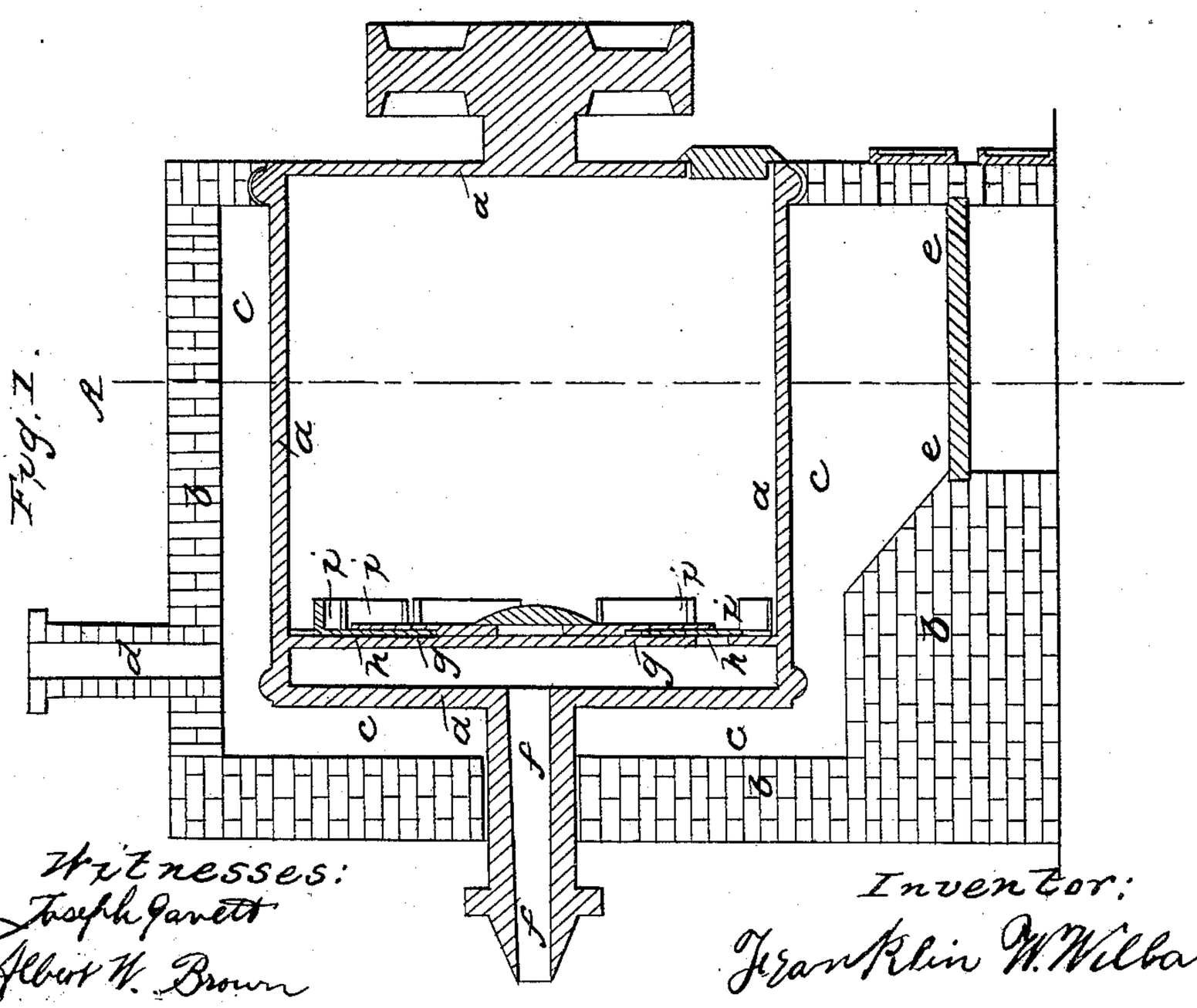



Fig. 1.

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# UNITED STATES PATENT OFFICE.

FRANKLIN W. WILLARD, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND E. G. ALLEN.

## IMPROVEMENT IN APPARATUS FOR DISTILLING COAL-OIL.

Specification forming part of Letters Patent No. **27,327**, dated February 28, 1860.

*To all whom it may concern:*

Be it known that I, FRANKLIN W. WILLARD, of New York, in the county and State of New York, have invented certain new and useful Improvements in Rotary Coal-Oil Retorts; and I do hereby declare that the following description, taken in connection with the accompanying drawings, hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements, by which my invention may be distinguished from all others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

The figures of the accompanying plate of drawings represent my improvements. Figure 1 is a central longitudinal vertical section of my improved retort. Fig. 2 is a transverse vertical section taken in the plane of the line A B, Fig. 1.

My improvements are made upon a rotary coal-oil apparatus for which Letters Patent of the United States were granted to me bearing date the 3d day of January, A. D. 1860, and fully described in the schedule annexed to the same, wherein, to prevent the passage of the coal and yet allow the exit of the oily vapors from the retort, I used a circular plate hung upon a shaft revolving with the retort, and having an aperture larger than the diameter of the said shaft, and forming the bearing of the same, whereby as the retort and its shaft revolved the circular plate would remain stationary and bear upon the bottom of the retort, and thus exclude the coals from the exit-passage, while admitting free passage to the vapors through the aperture of the circular plate. But I have found in practice that as the retort revolved the coals would be ground between it and the end and side surfaces of the circular plate, forming dust and small particles that mingled with the oily vapors and passed out with the same, the deleterious effects of which will be manifest.

To obviate this objection is the object of the present invention, and I effect the desired result by using, in lieu of the circular plate operating as aforesaid, a series of valves, which are so actuated by the revolving motion of the retort as to always keep open a certain number of parts or apertures at the upper portion of the retort and leading to the exit-passage of the same, and keep the remaining number of parts at the bottom of the retort closely shut, thereby permitting free exit to the oily vapors and preventing any particles of the coals from being ground up and mingling and passing out with the vapors.

*a a* in the accompanying drawings represent a cylindrical retort set in a brick furnace, *b*, leaving a flue space or chamber, *c c*, entirely around the retort, through which flue or chamber the products of combustion from the fireplace *e e* pass, and then make their escape at the chimney *d d*. The retort *a a* has for its rear bearing or journal a hollow shaft, *f*, the front end being supported in any proper manner. The retort has a rotary motion imparted to it in any suitable manner. The retort is filled with a charge of coal and exposed while revolving to a temperature of about 850° Fahrenheit. The oily vapors thus formed or produced are permitted to escape through the exit-passage *f*, and at the same time prevent the clogging of the same by particles of coal, as follows: At a suitable distance from the rear end of the retort is a fixed partition, *g g*, having ports or apertures *h h*, &c., formed therein, as shown in the drawings, the said partition revolving with or forming a part of the retort. *i i*, &c., are a series of valves hung upon pivots *k k*, &c., which serve the purpose of covering and uncovering the ports or apertures *h h*, &c., in the partition *g*. Thus as the retort revolves, one or more of the valves *i i* that are uppermost or near the upper portion of the retort will drop by their own weight, and thereby open the ports or apertures *h h*, &c., and allow of the free exit passage of the oily vapors, while the remaining valves will keep closed, and thus prevent the particles of coal from mingling and passing out with the vapors. As the valves *i i* in the lower portion of the retort thus remain stationary, they will revolve with the retort, so that there will be no motion or grinding action between the said valves and the interior surface of the retort, thereby preventing the formation of dust or small particles of coal to mingle with the vapors that would otherwise be the result.

It will be evident that there are many arrangements of devices other than those described—such as by the action of springs, &c.—whereby one or more of the valves at the upper portion of the retort can be kept open so as to admit the exit of the vapors, and the lower portion of the series of valves kept closed to prevent the passage of particles of the coals, the essential feature of my invention consisting in so arranging and actuating the valves by any suitable means that one or more of the upper ones will be kept open and the remaining ones closed, for the purpose specified.

Having thus described my improvements, I shall state my claim as follows:

The arrangement of a series of valves and ports, in combination with the revolving retort, so operating as to always leave open one or more of the said ports at the upper portion of the retort and keep the remaining ports at the lower portion thereof closed, substantially as described, and for the purposes specified.

FRANKLIN W. WILLARD.

Witnesses:
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