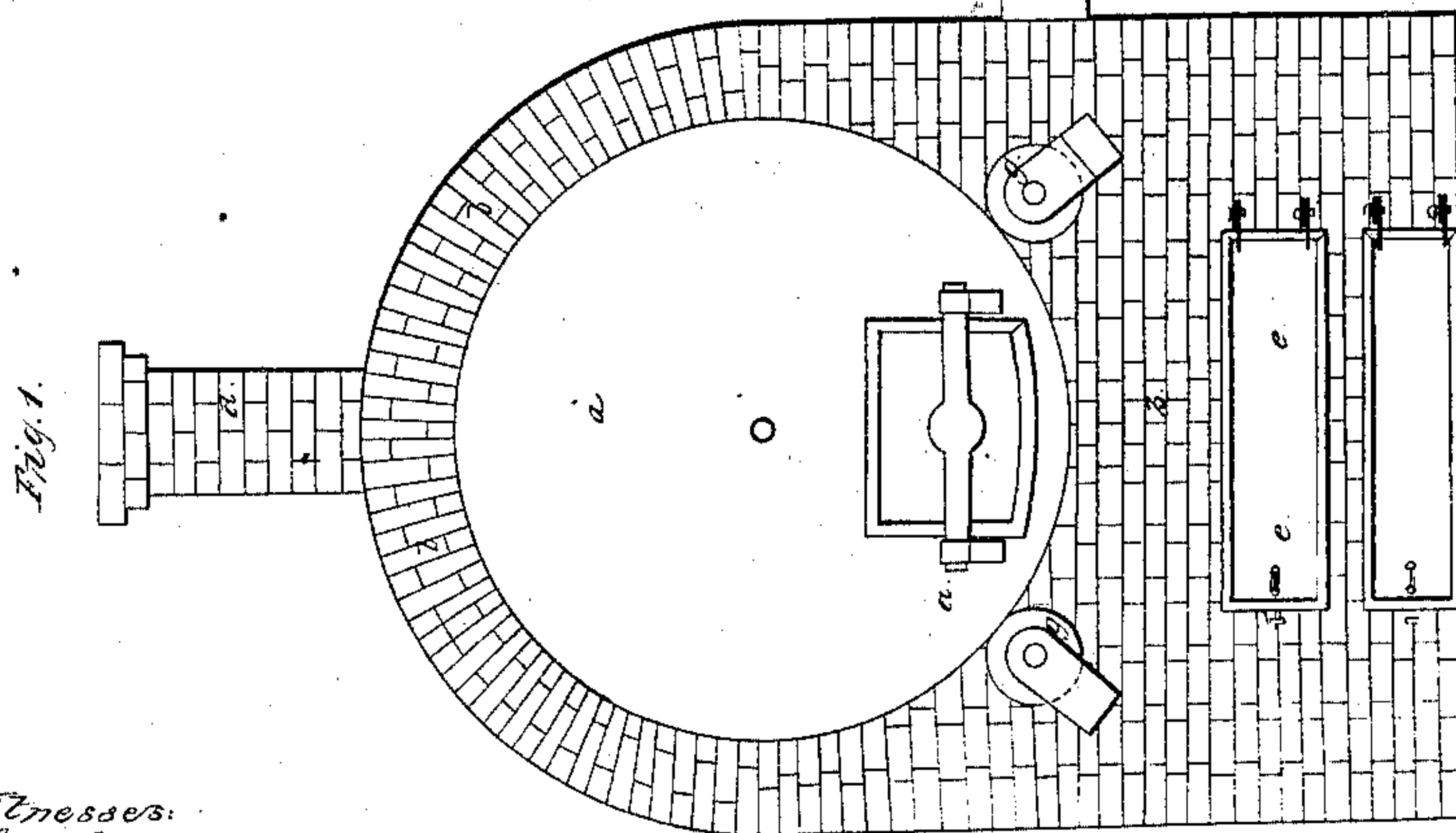
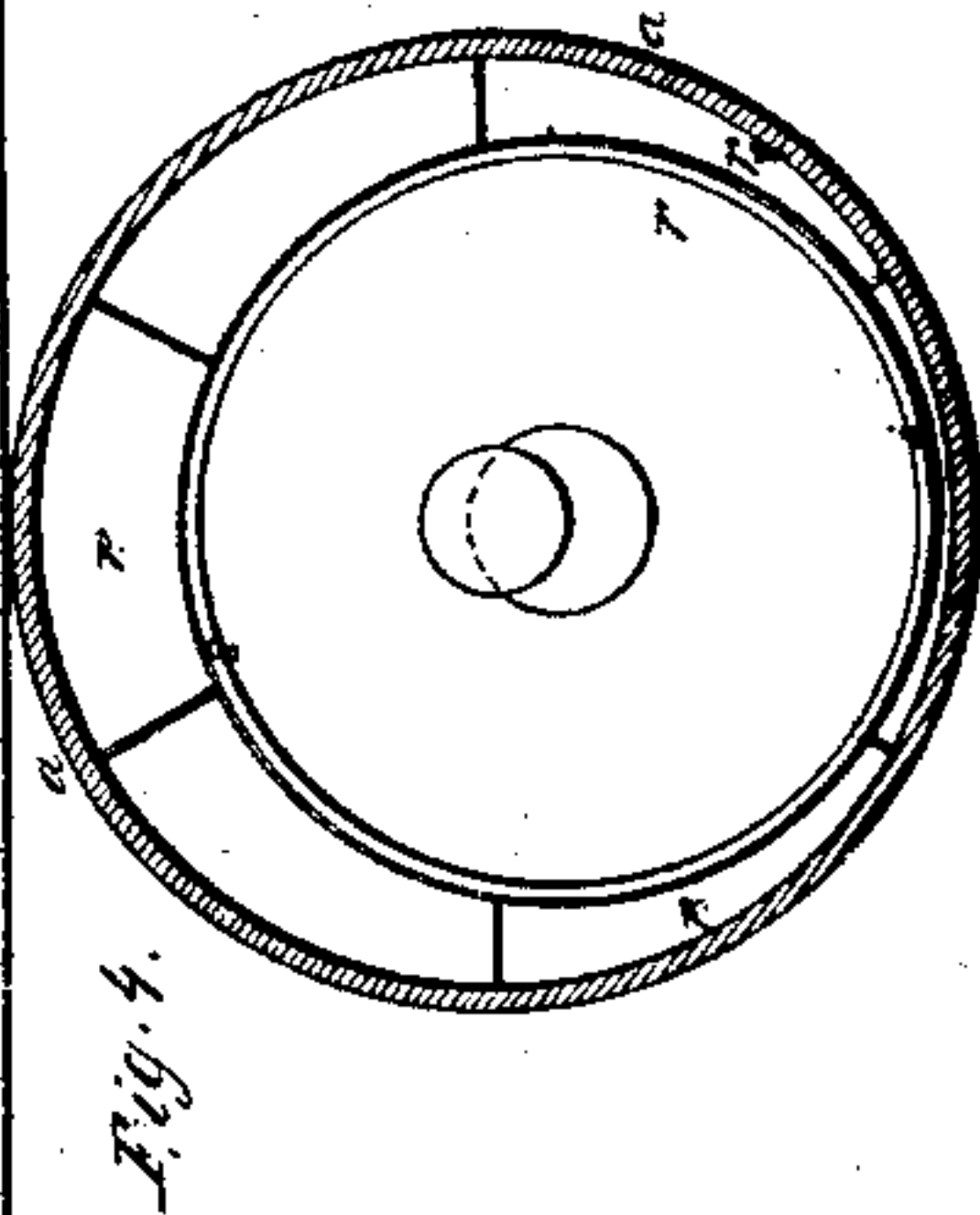
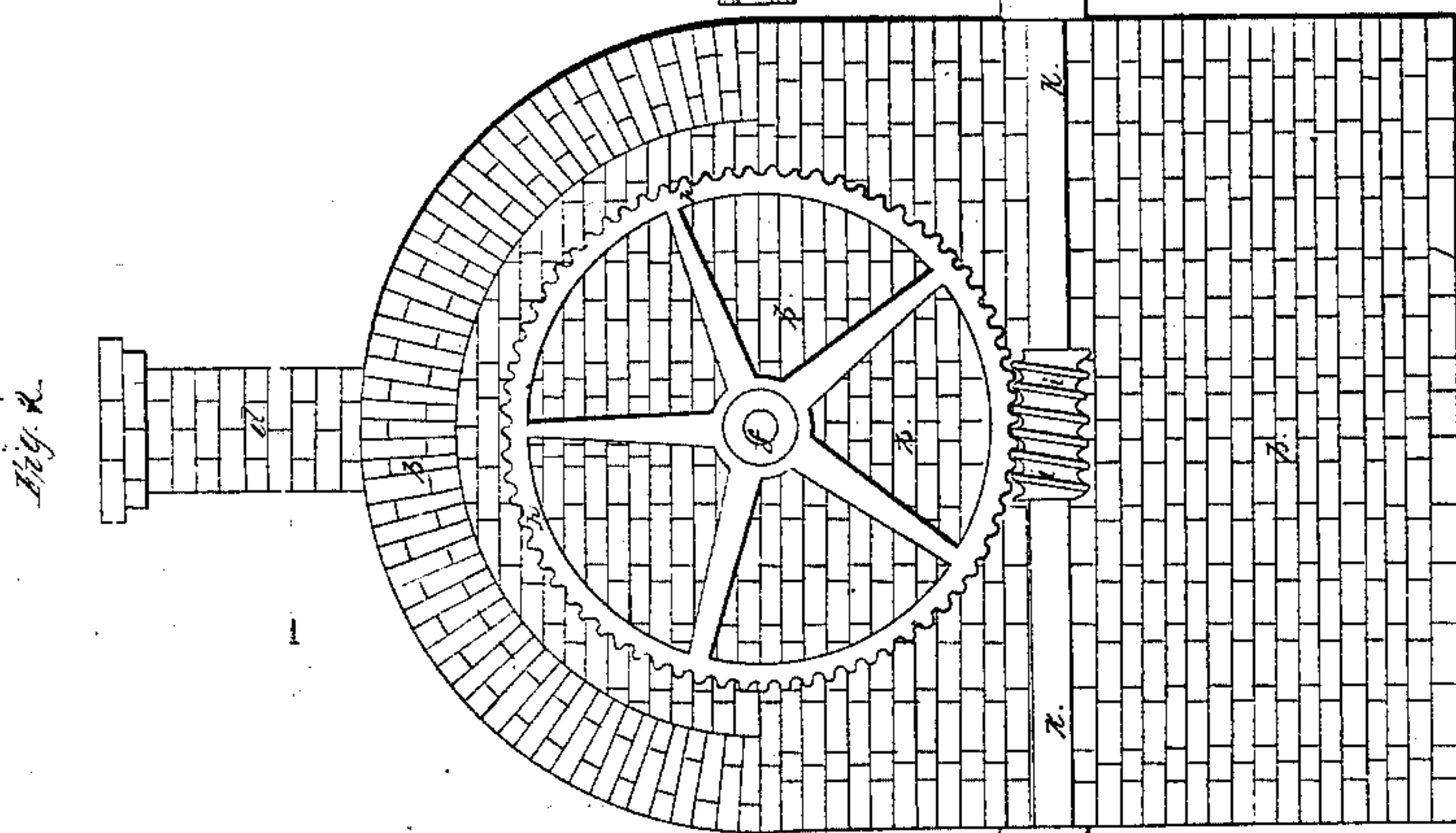
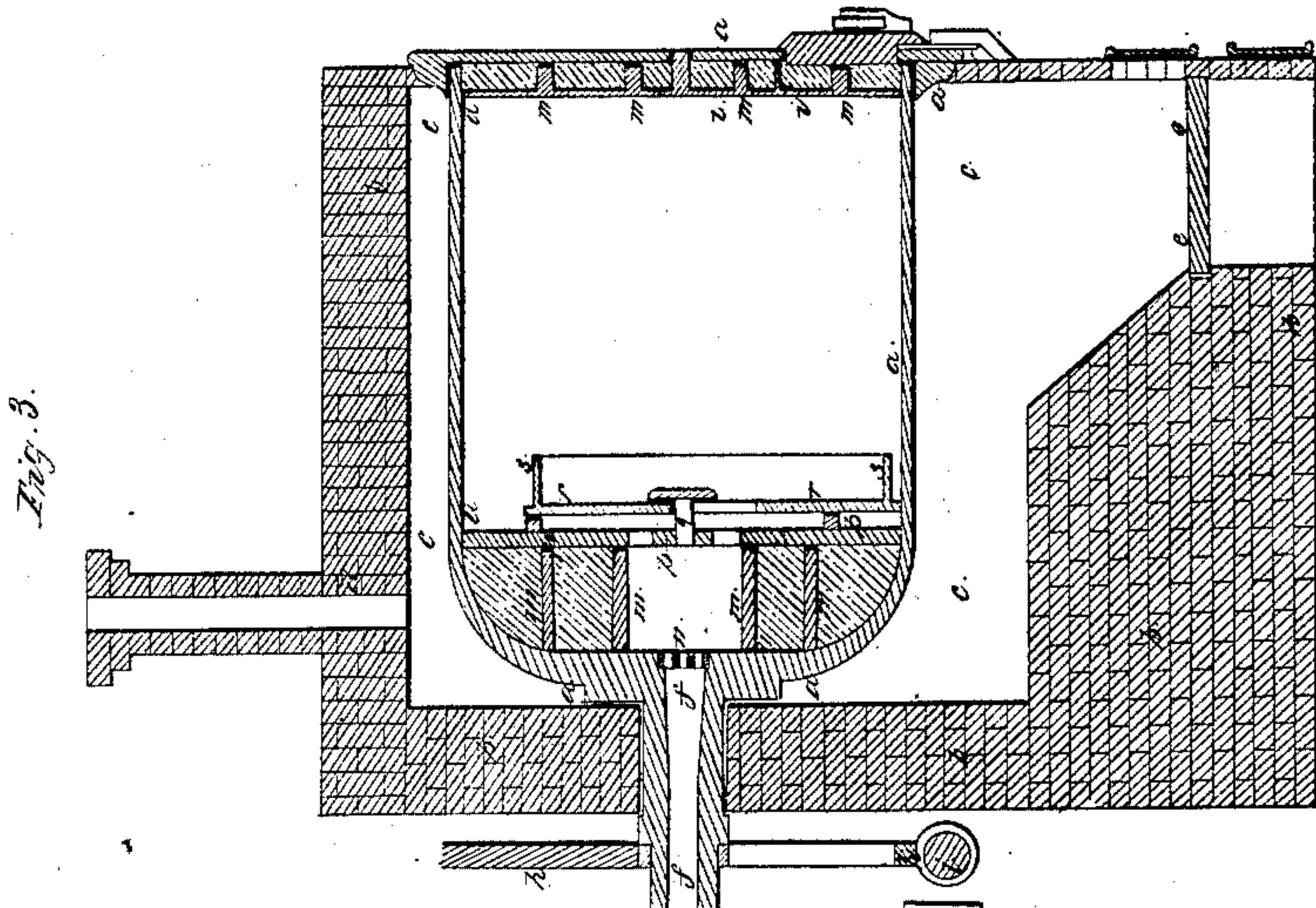


F. W. WILLARD.
COAL OIL APPARATUS.

No. 26,739.

Patented Jan. 3, 1860.



Witnesses:
Joseph Garrett
Albert H. Brown.

Inventor:
F. W. Willard
by his atty
C. Lincoln.

UNITED STATES PATENT OFFICE.

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

IMPROVEMENT IN COAL-OIL RETORTS.

Specification forming part of Letters Patent No. 26,739, dated January 3, 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 Apparatus for Distilling Coals, &c.; 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 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 view of the front end of my improved machine. Fig. 2 is a view of the rear end. Fig. 3 is a central longitudinal vertical section of the same. Fig. 4 is a detail view, to be hereinafter referred to.

My invention consists in an improvement in a rotary retort used for distilling oil from coal, &c., and is designed, first, to prevent the escape of heat from the retort and the danger of deterioration and final destruction of the ends of the same by burning out, these results being effected by using double heads, the space between which is filled with clay or other non-conductor of heat, while studs or braces are used to prevent the springing or warping of the parts.

My second improvement consists in an arrangement of devices by which the hollow shaft through which the oil is delivered is prevented from being clogged and obstructed with particles of coal, &c.

a a in the accompanying drawings represent a cylindrical retort set in a brick furnace, *b b*, leaving a flue space or chamber, *c c*, entirely around the retort, through which chamber the flame and products of combustion from the fire-place *e e* circulate and make their escape at the chimney *d*. The retort *a a* has for its rear bearing or journal a hollow shaft, *f*, the front end being supported by two friction-rollers, *g g*. The retort has a rotary motion imparted to it by means of a large gear-wheel, *h*, on the shaft *f*, engaging with a worm or endless screw, *i*, on a horizontal shaft, *k*, or in any other 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 escaping through the hollow shaft *f* into any proper condensing apparatus.

In order to prevent the escape of heat from the retort and the danger of destruction to the ends of the same, double heads *l* and *p* are used, the space between the ends of the retort and the extra heads being filled with clay or other non-conductor of heat, braces or studs *m m* being used to prevent the springing or warping of the parts, as shown in Fig. 3.

To obviate the liability of clogging the strainer *n n* of the hollow shaft *f* with particles of coal, I have adopted the following arrangement of devices: To the rear false head, *p*, is hung, by a short shaft, *q*, a circular plate, *r*, having an aperture larger than the shaft *q* and a flange or lip, *s*. While the head *p* and its shaft *q* revolve with the retort, the plate *r* remains stationary and in contact with the bottom of the retort, and thus prevents the coals, &c., which occupy the lower portion of the retort, from passing into the hollow shaft *f*, as will be readily understood without further explanation.

It will be evident that it will be necessary to construct both the false head *p* and the eccentric plate *r* in sections, in order that they may be introduced either through the man-hole *t* or the door of the retort.

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

What I claim as my invention, and desire to have secured to me by Letters Patent, is—

1. The construction of coal-oil retorts with internal false or extra heads at either end of the retort, and held at proper distance from the heads proper by means of stays or studs, as described, the intervening space between each of the false heads and the end of the retort being filled with clay or other non-conducting material, substantially in the manner and for the purposes herein specified.

2. The use of the circular plate *r*, hung upon the false head *p*, and operating as described.

FRANKLIN W. WILLARD.

Witnesses:

IRA O. MILLER,
M. K. ROSENDALE.