

Dec. 27, 1927.

1,654,358

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COMBUSTION CHAMBER

Filed April 25, 1924

Fig. 1.

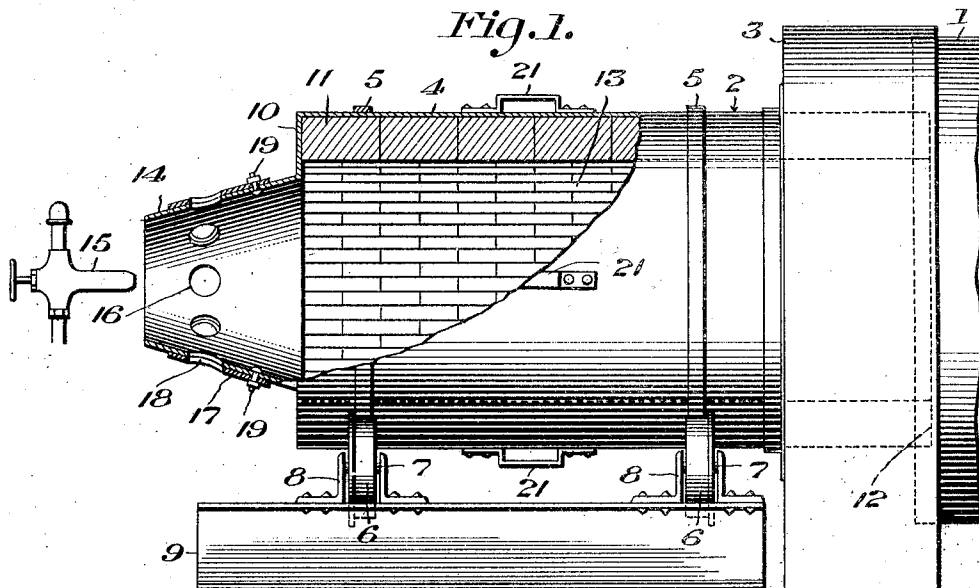
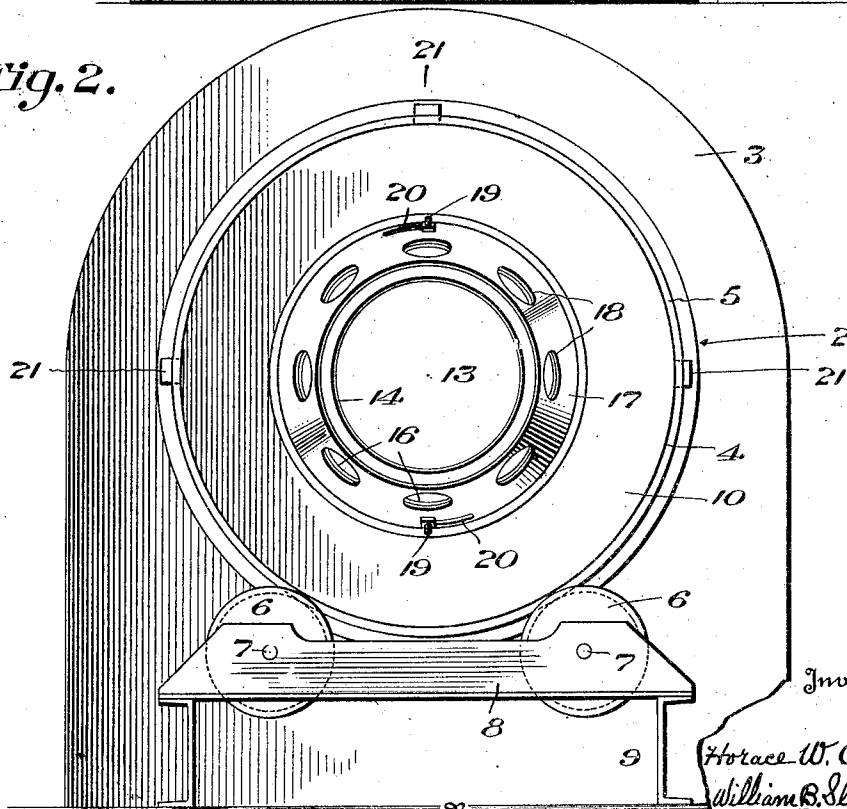


Fig. 2.



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COMBUSTION CHAMBER.

Application filed April 25, 1924. Serial No. 709,051.

This invention relates to improvements in combustion chambers or tubes designed especially for use with driers and the like, but it is not confined to such use.

5 The combustion chambers employed with driers are usually built of steel and lined with fire-brick. These chambers are made in various shapes and sizes. The improved combustion tube forming the subject matter
10 of the present invention preferably has a circular cross-section and may be lined with arch-brick of the type usually carried by dealers in such material. The oil and vaporizing agent, either steam or air, employed to heat the combustion chamber, is
15 usually blown from an oil burner into the combustion chamber, and on account of the diameter necessary in the combustion tube to properly carry without congestion, the
20 vaporized oil, steam and air necessary for combustion, the oil burner is usually set back from the end of the combustion chamber a short distance. The tendency of the flame from the burner is to rise to the top
25 of the tube and there is generally an area at the upper portion of the tube, which receives the contact of the flame, and sooner or later this area wears and burns out to an extent that ordinarily necessitates the re-lining of
30 the combustion chamber.

Now the primary object of the present invention is to furnish a combustion chamber capable of turning about an axis—fixed relatively to the burner, so that the combustion chamber may be turned whenever necessary
35 or desired, to bring a different portion of the lining uppermost, whereby the part of the tube ordinarily receiving the flame may be shifted to save the same from wear and
40 burning out.

Another object of the invention is to furnish a rotatable combustion chamber mounted upon supporting wheels and capable of being readily turned or shifted manually.

45 A further object of the invention is to arrange a rotatable combustion chamber at the end of a drier.

A still further object is to provide a substantially cone-shaped sleeve, which is secured to the inner end of the combustion
50 chamber, to provide a space in which expansion of the gasified oil may take place be-

fore coming in contact with the inner surface of the combustion chamber. We take
55 advantage of this space in which the gasification or vaporization is going on, and in which the preliminary stages of combustion are being effected, to introduce a damper for controlling air holes leading to the interior of the substantially cone-shaped
60 sleeve. This damper is of tubular form and can be rotated, thereby giving an easy method of regulating the air supply to suit the quantity of oil being burned. In addition to providing an air control, this substantially cone-shaped member effectively
65 increases the length of the combustion tube without having to carry the fire-brick the full length of the combustion tube and sleeve.

70 With the foregoing objects outlined and with other objects in view which will appear as the description proceeds, the invention consists in the novel features hereinafter described in detail, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

Referring to the drawings:

Figure 1 is a side view of one end of a drier, and the improved combustion chamber and cone-shaped sleeve, the tube and sleeve being shown partly in section.

Figure 2 is an end view of these parts.

In the drawings, 1 designates the outlet end of an ordinary rotary drier to which
85 heated gases are fed from a combustion chamber or tube 2. 3 designates a stationary hood, covering the discharge end of the drier 1, and into which the combustion chamber projects. The hood is provided at
90 some convenient point in its bottom with an outlet opening to allow the material which is being dried to discharge from the drier.

The combustion chamber, forming one of the novel features of the present invention,
95 preferably consists of a cylindrical metal shell 4 provided with tires or tracks 5, spaced apart and resting on supporting wheels 6. A pair of supporting wheels is provided for each tire or track and the
100 wheels of each pair are located on opposite sides of the axis of the tube 4, so that the tube may be readily rotated without rolling off of said wheels. Each wheel is mounted

on an axle 7 and these axles are carried by cross beams 8 resting on longitudinal beams 9.

The tube 4 is provided intermediate its ends with an annular shoulder 10 forming an end wall limiting the space lined by the fire-brick 11. This fire-brick is of the ordinary arch type and the lining extends from the shoulder 10 to the outlet end 12 of the combustion chamber. This lining is of tubular formation to provide the combustion space 13.

Extending outwardly from the shoulder 10, is a frusto-conical sleeve 14 having its smaller end arranged adjacent an oil burner 15, which has its axis co-axial with the axis of the tube 4. The sleeve 14 is provided with air holes 16, the size of which may be varied by a damper sleeve 17 having complementary air holes 18. The damper sleeve is adjustably held in position by bolts or the like 19 connected to the sleeve 14 and extending through slots 20 in the damper sleeve. It will be recognized at once, that the sleeve 17 may be adjusted at any time to control the supply of air passing into the sleeve 14.

It will be noted that the sleeve 14 extends outwardly for some distance beyond the wall 10, so that the effective length of the combustion chamber is increased without necessitating the use of fire-brick throughout the length of the combustion chamber.

From the above description the following statement of the operation may be readily followed. Assuming that the parts are in the position shown in the drawings, either oil, or oil and steam, under pressure will be discharged from the burner 15 directly into the sleeve 14 and in its passage it will entrain air through the open end of the tube 14 as well as through the apertures 16 and 18, and the ignition of this mixture will generate highly heated products of combustion within the combustion space 13. As before stated, the flame thus produced, has a tendency to rise and consequently the fire-brick at the upper portion of the combustion chamber will be subjected to more intense heat and greater friction than the remaining portion of the lining, so that this upper portion of the lining has a tendency to rapidly wear and burn out. To obviate the destruction caused by such action, we make the combustion chamber rotatable, and to permit the operator to readily turn the combustion chamber whenever desired, handles 21 are arranged on the tube 4, and the

operator may place any suitable tool in either one of these handles and thus rotate or turn the combustion chamber when necessary. If the combustion chamber is turned at the proper times, the lining will wear and burn uniformly, so that substantially all of the lining will have to be destroyed before it will be necessary to re-line the combustion chamber. The advantages of this feature will be apparent without further description.

From the foregoing, it is believed that the construction, operation and advantages of the invention may be readily understood by those skilled in the art, and it is apparent that changes may be made in the details disclosed without departing from the spirit of the invention as expressed in the claims.

What we claim and desire to secure by Letters-Patent is:

1. The combination with a rotary drier, of an independently rotatable tubular combustion chamber arranged at one end of the drier and having its axis substantially parallel with the axis of the drier, means for injecting gaseous fuel into the outer end of said combustion chamber, and circumferentially placed equi-distant handles secured externally of the combustion chamber for facilitating the periodic rotation of the latter to ensure uniform action of the flame on the entire internal area of the combustion chamber.

2. In combination, a rotary drier, a rotary combustion chamber, comprising a cylindrical shell having on one end an inwardly extending annular shoulder, a concentric frusto-conical sleeve formed integral with and extending outwardly from said shoulder, said sleeve having an annular series of air holes, a damper sleeve rotatably mounted on said frusto-conical sleeve, said damper sleeve having a series of air holes adapted to be brought into and out of alignment with the holes in said frusto-conical sleeve, a fire-brick lining in said cylindrical shell, one end of said lining abutting said shoulder, means for rotatably supporting said combustion chamber, means for manually rotating the same, and a stationary hood covering the discharge end of the drier and into which the adjacent end of the combustion chamber projects.

Signed at the city of Boston, in the county of Suffolk and State of Massachusetts, this 24th day of April, A. D. 1924.

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