

S. MERTENS.
 APPARATUS FOR DRYING LIGNITE.
 APPLICATION FILED SEPT. 2, 1908.

1,047,969.

Patented Dec. 24, 1912.

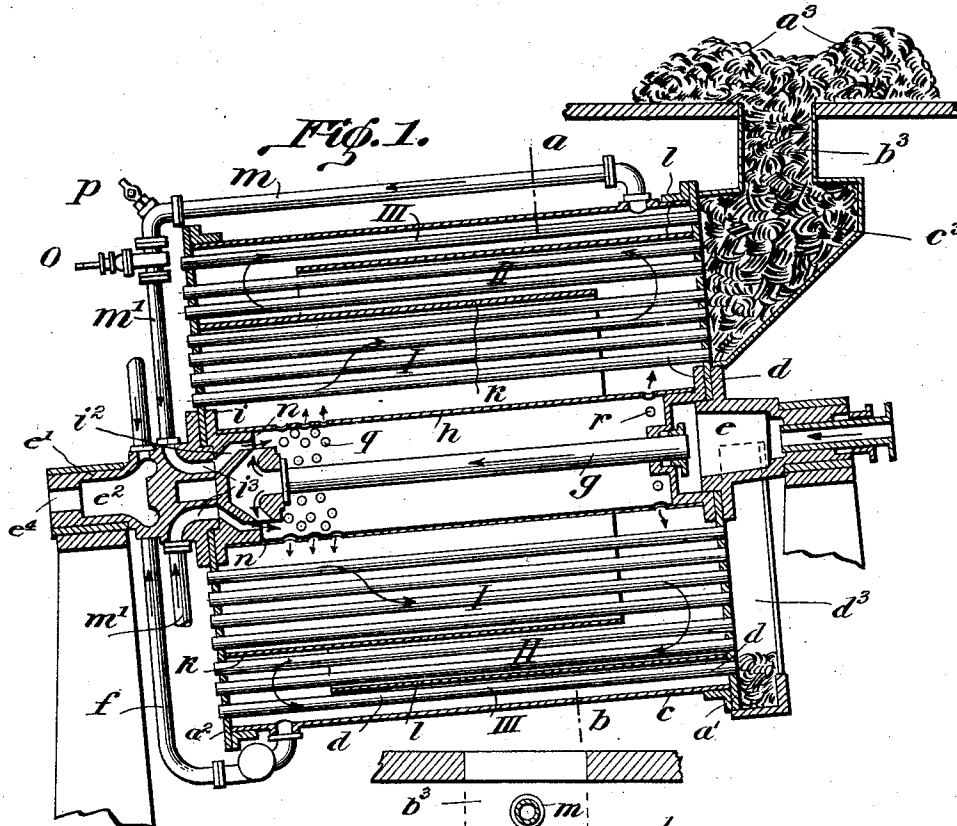
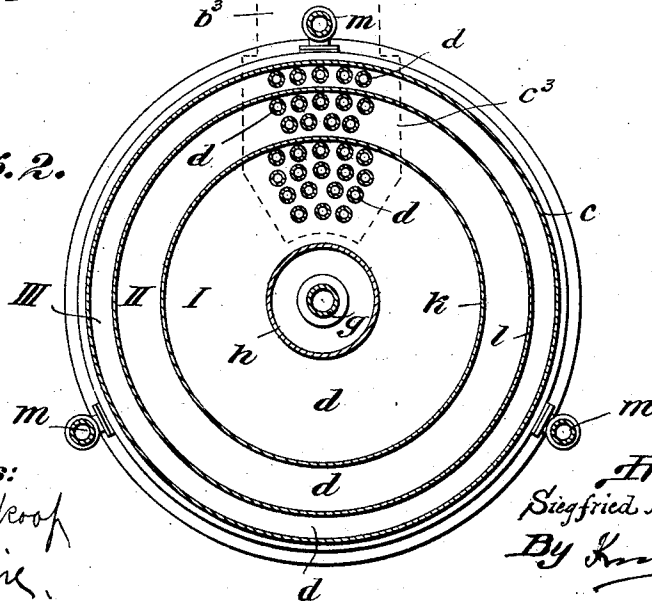


Fig. 2.



Witnesses:
 J. M. Winkroop
 E. R. Keine.

Inventor:
 Siegfried Mertens,
 By Knight Bros.

Attorneys:

UNITED STATES PATENT OFFICE.

SIEGFRIED MERTENS, OF COLOGNE, GERMANY.

APPARATUS FOR DRYING LIGNITE.

1,047,969.

Specification of Letters Patent.

Patented Dec. 24, 1912.

Application filed September 2, 1908. Serial No. 451,420.

To all whom it may concern:

Be it known that I, SIEGFRIED MERTENS, a subject of the German Emperor, residing at Altenburgerstrasse, 7, Cologne-on-the-Rhine, Germany, have invented new and useful Invention Concerning an Apparatus for Drying Lignite, of which the following is a specification.

This invention relates to improvements in supplying and maintaining a uniform stream or fluid current in machines, such as feedwater heaters, evaporators, etc., wherein the material to be dried or the liquid to be heated is contained within pipes or receptacles which are inclosed within a hollow casing forming a heating chamber, and through which the steam or other heating agent is caused to circulate.

Heretofore one of the objections to machines of this character has been that no suitable means was provided for properly ventilating the heating chamber *i*. *e.* for causing the air which is present in the heating chamber and which, upon the entrance of the fresh steam or heating fluid, is forced about the circulating system, to escape from said system and thereby increase the heating proclivity of the heating agent.

In the drawing, Figure 1 is a longitudinal section view of a machine wherein lignite is treated and which shows one of the preferred embodiments of my invention; Fig. 2 is a cross sectional view of the same taken on the line *a-b* of Fig. 1.

Referring to the drawing the reference letter *c* indicates a cylindrical casing of a drying machine the opposite ends of said casing being inclosed by means of the plates *a*¹ and *a*². A plurality of receiving pipes *d*, are arranged in concentric rows within said casing, (see Fig. 2) the said pipes being open at each end and adapted to receive the material to be treated.

*b*³ is the chute through which the coal from the coalbin *a*³ falls into a fixed trunk or guide *c*³. The charging trunk *c*³ is open toward the apparatus so that the tubes of the drying drum receive the coal in passing the filling trunk. Any coal falling back from the tubes, will be caught by a trunk *d*³, which covers the lower half of the apparatus on the front end and will be again taken up by the tubes. This cylindrical casing when in operative position is mounted at an incline on suitable supports, the hollow axle pivots *e* and *e*¹ being journaled in

the bearing of the supports. The axle pivot *e* is provided with an inlet port which, communicates with the open end of the pipe or tube *g*, which is connected at its opposite end with the hollow T-shaped head *i*.

A plurality of openings are formed in the sides of said head *i* as at *i*² which permit the steam or other heating agent, which is introduced at *e* from any suitable source, and which passes through the pipe *g*, into the head *i*, to pass into the cylindrical casing *h* which surrounds the pipe *g*, and which is provided with a plurality of perforations as at *q*, these perforations permitting the passage of the steam into the main cylinder and thus circulating about the receiving pipes *d*.

As has been explained, the casing *c* is supported in an inclined position, and it will thus be seen that any water of condensation which gathers within the casing will flow to the rear thereof. In order to remove this water, the pipes *f* are connected to the cylinder adjacent to its rear or lower end, these pipes leading to an outlet port *e*² formed in the axle pivot *e*¹.

In order to assure a complete circulation of the heating fluid, annular baffle plates *k* *l* are secured to the respective ends of the cylinder *c*, whereby passages I, II and III are formed. Adjacent to the upper end of the passage III are the three pipes *m*, which are connected at their opposite ends with the hollow axle pivot *e*¹ and in communication, with ports *i*³, which in turn register with the ports *i*², formed between the flanged collar *n* and the hollow head portion *i*. These three pipes *m* are each provided with a ventilator *p* and a cut out valve *o*.

From the above description the operation will be seen to be as follows: The lignite or material to be treated is forced into the receiving tubes *d*, until the tube is filled. The steam is then permitted to enter the hollow axle *e*, passing through the tube *g* and out through the ports or channels formed in the head *i*. It will be understood that the air which of course fills the tubes and cylinders previous to the entrance of the steam will intermingle with the steam and this must necessarily greatly reduce the heating power of the steam. The heating fluid upon leaving the head *i* enters the cylinder *h* and thence out through the perforations *q* into contact with the lignite

holding pipes, and after passing through the passages I, II and III the steam enters the pipes *m*.

The valves *o* arranged on the pipes *m* are closed so that the air driven by the live steam exhausts through the ventilator *p*. After a short time substantially all of the air will be forced out of the machine by the live steam. At this time the valve *o* is opened and the steam rushes through the entire length of the pipe *m*¹ and into the hollow axle *e*¹ and passes through the channel *i*³ therein, and into the cylinder *h*, via the annular passage *i*².

It will now be seen that the heating fluid which has already made a complete circuit of the machine, the heating power of which must necessarily be partly exhausted, re-enters the central cylinder, adjacent to the point where the fresh or live steam enters from the pipe *g* and will commingle therewith, whereby it will be freshened up, and upon its second circuit of the machine will give off substantially the same amount of heat. However when the life of the steam has been exhausted or materially reduced, the valves *o* in the circuit pipes *m* are closed whereby the heating fluid will be discharged through the ventilator *p*.

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

1. In a machine of the character described, a hollow casing, a plurality of receptacles mounted therein, baffle plates secured between said receptacles, whereby circuits for heating fluid are formed; a central hollow casing adapted to receive the incoming heating fluid, and permit the circulation of said fluid through the outer casing, and circuit pipes provided with valve and ventilating means, one end of said pipes communicating with the first named casing, the opposite ends thereof being in communication with the central casing, whereby the heating fluid may be discharged through the ventilating means or may be directed into the central hollow casing.

2. In a machine of the character described, the combination with a cylinder, receptacles mounted therein, a central concentric cylinder provided with openings, said cylinder adapted to receive the incoming heating fluid, the said fluid being per-

mitted to escape through the openings in said cylinder and circulate about the first named cylinder; of circuit pipes provided with valve and ventilating means, one end of said pipes communicating with the first named cylinder, the opposite end thereof in communication with the central cylinder, whereby the heating fluid may be discharged from the circuit pipes into the atmosphere or may be returned to the central concentric cylinder.

3. In a machine of the character described, the combination of a casing, receptacles, mounted therein, a mixing cylinder secured within said casing and adapted to receive the heating fluid, with a plurality of circuit pipes one end of said pipes communicating with the outer casing while the opposite ends thereof communicate with the mixing cylinder, and means secured to each of said pipes, whereby the heating fluid may be discharged into the atmosphere or may be returned to the mixing chamber, to mingle with the fresh incoming fluid.

4. In a device of the class described, the combination with a cylinder, a plurality of receptacles mounted therein, of a central steam chamber and baffle plates for causing the steam to circulate about said receptacles and thereafter return to said steam chamber.

5. In a device of the class described, the combination with a central perforated steam chamber, a plurality of receptacles, concentrically arranged about said chamber, baffle plates interposed between said receptacles to form passages for the steam, and means for returning the steam to the steam chamber after it has circulated through the passages.

6. In a device of the class described, the combination with a cylinder, a central perforated chamber, a steam supply communicating with one end of said chamber, and a return pipe in communication with said cylinder and with the opposite end of the perforated chamber whereby the steam which has circulated through the cylinder, may be returned to the perforated chamber to mingle with the incoming steam from the steam supply.

SIEGFRIED MERTENS.

Signed in presence of—
DESIDERIUS VANDORY,
M. KÜPPERS.