

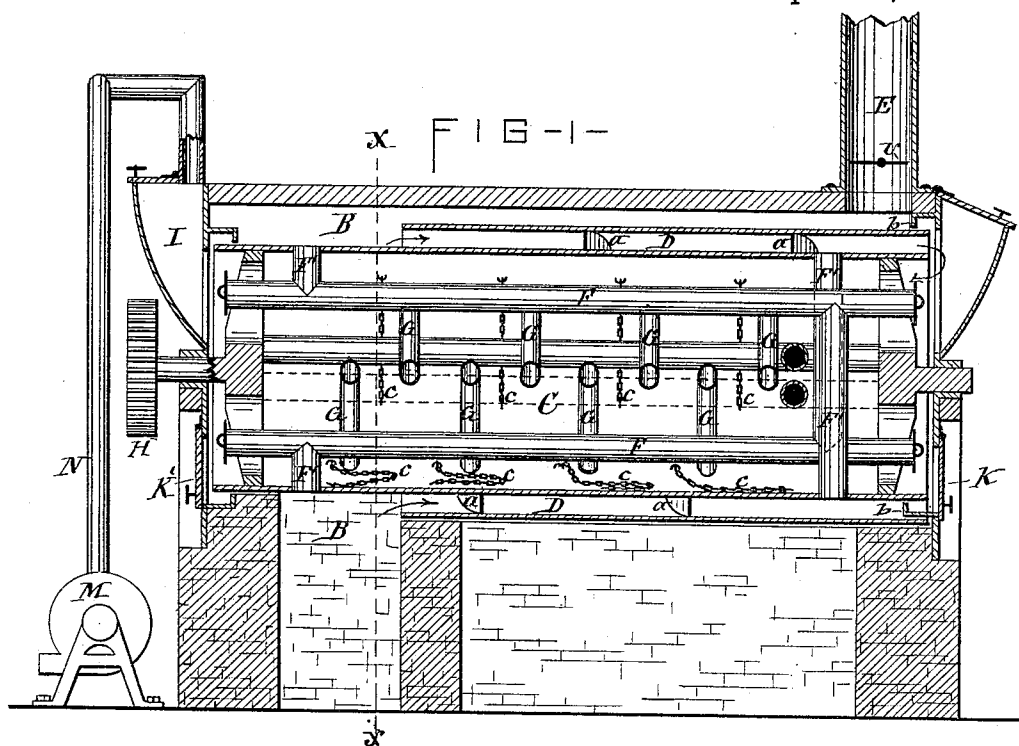
(No Model.)

2 Sheets—Sheet 1.

H. BREER.
DESICCATING APPARATUS.

No. 326,843.

Patented Sept. 22, 1885.



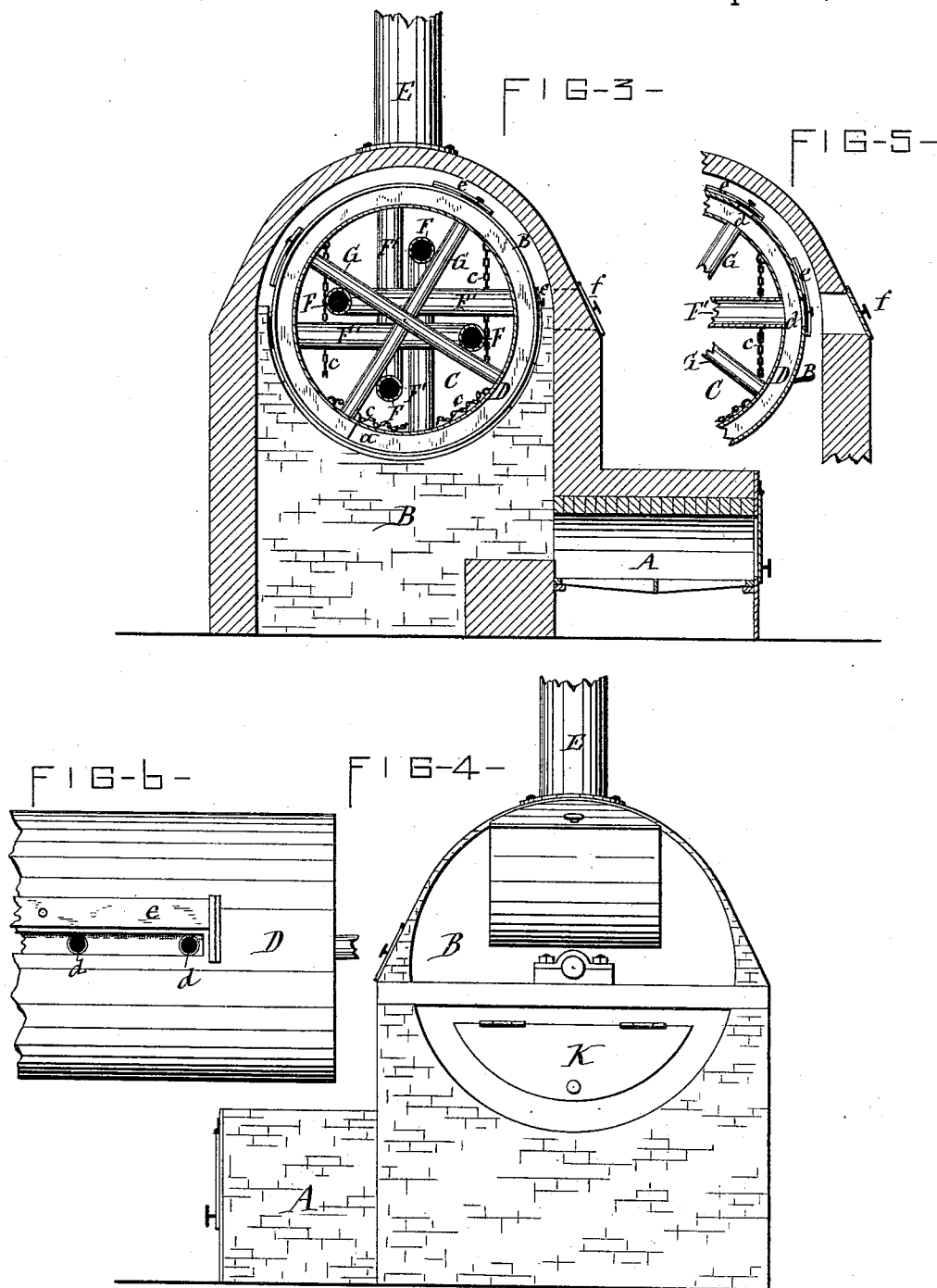
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ATTEST—
Wm. C. Raymond
E. C. Cannon

INVENTOR—
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UNITED STATES PATENT OFFICE.

HENRY BREER, OF DE WITT, NEW YORK, ASSIGNOR TO CAROLINE H. BREER, OF SAME PLACE.

DESICCATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 326,843, dated September 22, 1885.

Application filed March 3, 1885. (No model.)

To all whom it may concern:

Be it known that I, HENRY BREER, of De Witt, in the county of Onondaga, in the State of New York, have invented new and useful
5 Improvements in Desiccating Apparatus, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of desiccating apparatus in which a horizontal desiccating-cylinder is arranged to rotate in a combustion-chamber which completely incloses
10 said cylinder, and is provided with a feed-door for introducing the substance to be treated in the cylinder, and a discharge-door for removing the substance after it has been subjected to the desiccating process.

The invention consists in the combination, with the aforesaid desiccating-cylinder, of
20 flues extending through and around the said cylinder, so as to materially increase the heating-surfaces thereof, and in various other devices connected with the apparatus for the purpose of increasing its efficiency, all as hereinafter more fully explained, and specifically set forth in the claims.

In the annexed drawings, Figure 1 is a vertical longitudinal section of my improved desiccating apparatus. Fig. 2 is a vertical longitudinal section of the combustion-chamber and the smoke-jacket surrounding the desiccating-cylinder. Fig. 3 is a vertical transverse section on line *x x*, Fig. 1. Fig. 4 is an end view of the apparatus, and Figs. 5 and 6 are detail
30 views of the means of obtaining access to the flues or pipes inside of the desiccating-cylinder for cleaning said pipes.

Similar letters of reference indicate corresponding parts.

40 B represents the horizontal elongated combustion-chamber, communicating at one end with the furnace A, and provided at the opposite end with a chimney, E, which latter is provided with a valve, *v*.

45 C is the desiccating-cylinder, arranged horizontally and lengthwise in the combustion-chamber, and journaled in suitable bearings secured to the end walls of the combustion-chamber.

50 A pulley or gear-wheel, H, is secured to the axes of the cylinder for the purpose of trans-

mitting rotary motion to the cylinder from a suitable motive power.

A chute or feed-door, I, at one end of the combustion-chamber admits the substance to
55 be treated to the interior of the desiccating-cylinder C, and a discharge-door, K, is arranged at the opposite end of the combustion-chamber for removing the desiccated substance from the cylinder.

Between the cylinder C and inclosing combustion-chamber B is interposed an extra smoke-jacket, D, surrounding the cylinder C, and firmly secured thereto, so as to rotate
60 therewith. Said smoke-jacket communicates with the combustion-chamber at the end adjacent to the furnace A, and thus also communicates nearly direct with the latter. The opposite end of the smoke-jacket communicates with the interior of the desiccating-cylinder C, as indicated by an arrow in Fig. 1 of
70 the drawings. A space over the upper half of the smoke-jacket allows the products of combustion to pass from the furnace direct over the exterior of the smoke-jacket to the chimney E, when the valve *v* of the latter is open. At the end of the combustion-chamber which
75 has the chimney E a flanged ring, *b*, is extended around the exterior of the upper half of the smoke-jacket, and between the lower halves of the desiccating-cylinder and smoke-jacket, so that the upper part of the smoke-jacket is allowed to communicate with the interior of the desiccating-cylinder, while the communication between said parts is prevented at the lower portion thereof. I have
80 prior to my present invention employed a similar jacket around the desiccating-cylinder, as shown in Patent No. 303,914, granted to me August 19, 1884; but in said prior device the interior of the jacket had no communication with the furnace, and was designed only for containing steam; hence it
85 needed a different arrangement in relation to the furnace.

In order to effectually distribute the heat around the desiccating-cylinder C, I form a spiral or tortuous fire-passage through the smoke-jacket D by means of a spiral partition, *a*, therein.

G G designate pipes extended diametrically across the desiccating-cylinder, and commu-
100

nicating at opposite ends with the smoke-jacket.

F F are pipes arranged longitudinally or lengthwise in the interior of the desiccating-cylinder, and communicating at opposite ends, respectively, with the combustion-chamber and smoke-jacket by branch pipes F' F', extending through the sides of the desiccating-cylinder, as illustrated in Fig. 1 of the drawings. The ends of the longitudinal pipes F F are provided with removable covers to afford access to the interior of said pipes for cleaning the same, the covers being accessible through the doors K K' in the end walls or plates of the combustion-chamber.

In order to admit of cleaning the diametrical pipes G G and the branch pipes F' F', I provide the shell of the smoke-jacket with ports *d d*, directly in front of the ends of said pipes, and place over said ports a removable cover, *e*, as illustrated in Fig. 6 of the drawings; and the combustion-chamber I provide with a set of doors, *f*, in such positions as to permit of bringing the ports *d d* of the smoke-jacket in range with said doors by turning the desiccating-cylinder with the smoke-jacket.

c c denote vibratory beaters in the form of chains suspended by one end from the inner side of the combustion-chamber. During the revolution of the desiccating-cylinder the suspended chains *c c* are caused to strike and drag across the longitudinal pipes F F, and thereby jar the soot loose from the interior thereof and scrape from the exterior of the same the substance which may tend to adhere to said pipes. Said chains subsequently fall against the side of the desiccating-cylinder and roll or drag over the same, and thereby scour the inner surface of the desiccating-cylinder. Furthermore, during the aforesaid operation the chains *c c* serve to agitate and macerate the substance under treatment.

It will be observed that by the combination with the desiccating-cylinder of the pipes F and G the substance under treatment is subjected to greatly-augmented heating-surfaces, and is also thoroughly stirred during the revolution of the desiccating-cylinder.

The products of combustion can be diverted from the interior of the combustion-chamber and smoke-jacket whenever desired by opening the valve or damper *v* in the chimney E, when the products of combustion will pass from the furnace A directly through the upper portion of the combustion-chamber to the aforesaid chimney. By closing the valve *v* the products of combustion are compelled to pass from the furnace into the smoke-jacket D, from whence they are conveyed to the interior of the desiccating-cylinder at the farthest end thereof. A fan-blower, M, having its suction-pipe N communicating with the opposite end of the desiccating-cylinder, draws the products of combustion through and out of said cylinder.

In passing through the smoke-jacket D the

products of combustion are compelled to circulate completely around the exterior of the rotary desiccating-cylinder by the spiral partition *a*, and the distribution of the products of combustion is further promoted by the pipes F, F', and G passing through the desiccating-cylinder in the manner hereinbefore described.

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

1. In combination with the combustion-chamber and the horizontal rotary desiccating-cylinder, pipes arranged longitudinally in said cylinder, and branch pipes extending from the longitudinal pipes through the side of the cylinder, as and for the purpose set forth.

2. In combination with the combustion-chamber and the horizontal rotary desiccating-cylinder, pipes arranged longitudinally in said cylinder, branch pipes extending from the longitudinal pipes through the side of the cylinder, and a smoke-jacket surrounding the cylinder, substantially as set forth and shown.

3. In combination with the furnace, desiccating-cylinder, and the combustion-chamber inclosing said cylinder, two passages for products of combustion between the desiccating-cylinder and combustion-chamber, and extending lengthwise the same, one of said passages surrounding the desiccating-cylinder and communicating with the interior thereof at one end, and the other passage being arranged over the exterior of the first passage and communicating with the chimney, substantially as set forth.

4. The combination, with the horizontal rotary desiccating-cylinder, of a smoke-jacket communicating at one end with the furnace, and at the opposite end with the interior of the desiccating-cylinder, and a spiral partition in the smoke-jacket, substantially as described and shown.

5. The combination, with a horizontal rotary desiccating-cylinder, of a smoke-jacket surrounding said cylinder, pipes arranged longitudinally in said cylinder, and branch pipes extending from the longitudinal pipes to the combustion-chamber and smoke-jacket, substantially as described and shown.

6. The combination, with the horizontal rotary desiccating-cylinder, of a smoke-jacket surrounding said cylinder, a tortuous smoke-passage in said jacket, pipes arranged longitudinally in the desiccating-cylinder, and branch pipes extending from the longitudinal pipes to the combustion-chamber and smoke-jacket, substantially as described and shown.

7. The combination, with the horizontal rotary desiccating-cylinder, of a smoke-jacket communicating at one end with the furnace and at the opposite end with the interior of the desiccating-cylinder, spiral partitions in the smoke-jacket, pipes arranged longitudinally in the cylinder, and branch pipes extending from the longitudinal pipes to the com-

bustion-chamber and smoke-jacket, all combined substantially as described and shown.

5 8. The combination, with a rotary desiccating-cylinder, of a spiral smoke-passage formed on the exterior of the said cylinder, and arranged to rotate therewith.

10 9. The combination, with a rotary desiccating-cylinder, of a smoke-jacket surrounding said cylinder and arranged to rotate therewith, and pipes extended diametrically across the cylinder and communicating at opposite ends with the smoke-jacket, substantially as described and shown.

15 10. The combination, with a horizontally elongated combustion-chamber, of a furnace connected with one end thereof, a chimney at the opposite end of the combustion-chamber, a horizontal rotary desiccating-cylinder arranged lengthwise in the combustion-chamber, a smoke-jacket surrounding the desiccating-cylinder and arranged to rotate with the same, and communicating at one end with the combustion-chamber and furnace and at the
20 opposite end with the interior of the desic-

cating-cylinder, and a damper in the afore- 25 said chimney, whereby the products of combustion can be made to pass either from the furnace over the exterior of the smoke-jacket to the chimney, or through the smoke-jacket and desiccating-cylinder, substantially as de- 30 scribed and shown.

11. In combination to the rotary desiccating-cylinder and pipes extending transversely through it, a smoke-jacket surrounding said cylinder, ports in said jacket for cleaning the 35 aforesaid pipes, and removable covers over said ports, substantially as described and shown.

In testimony whereof I have hereunto signed my name and affixed my seal, in the presence 40 of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 28th day of January, 1885.

HENRY BREER. [L. S.]

Witnesses:

FREDERICK H. GIBBS,
WILLIAM C. RAYMOND.