

No. 618,236.

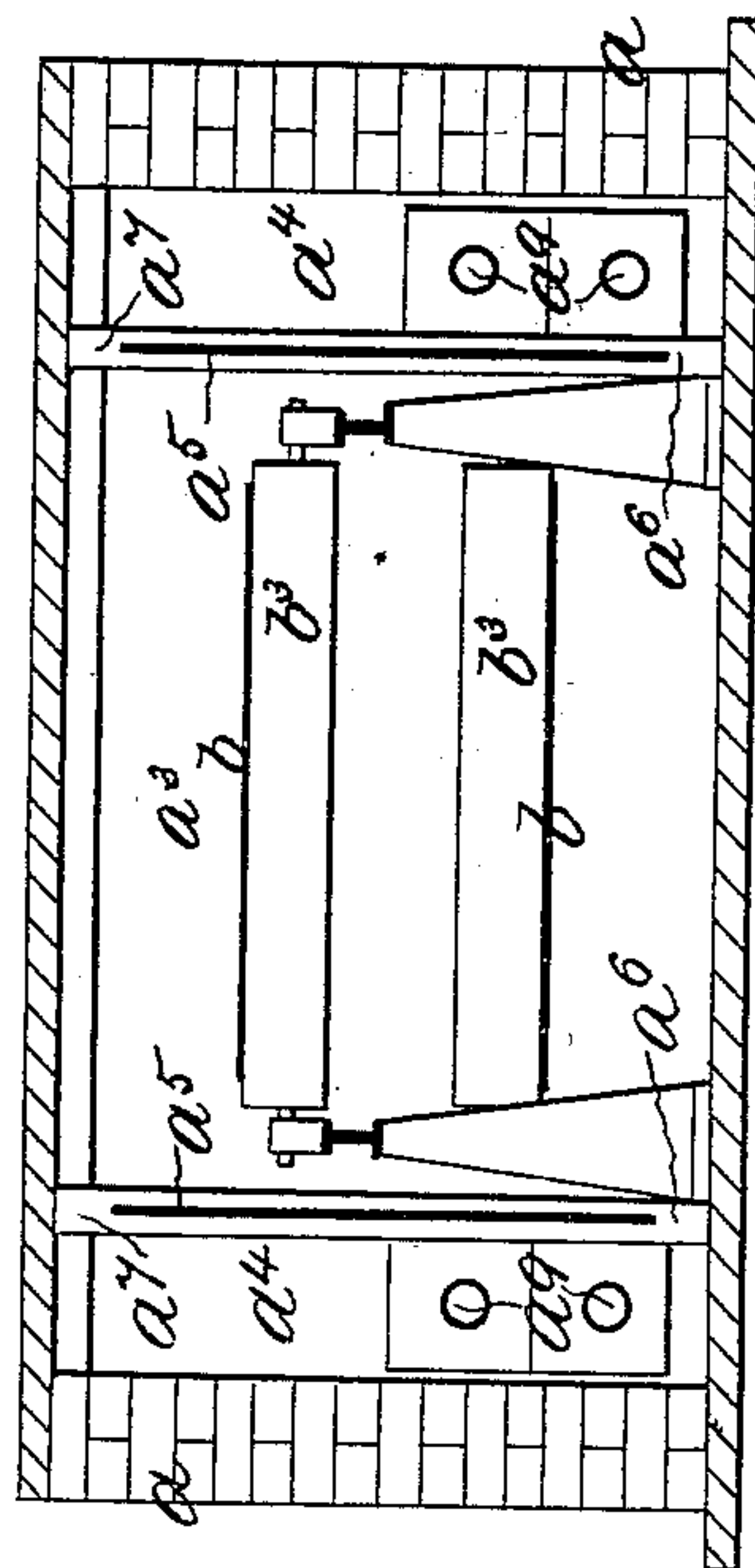
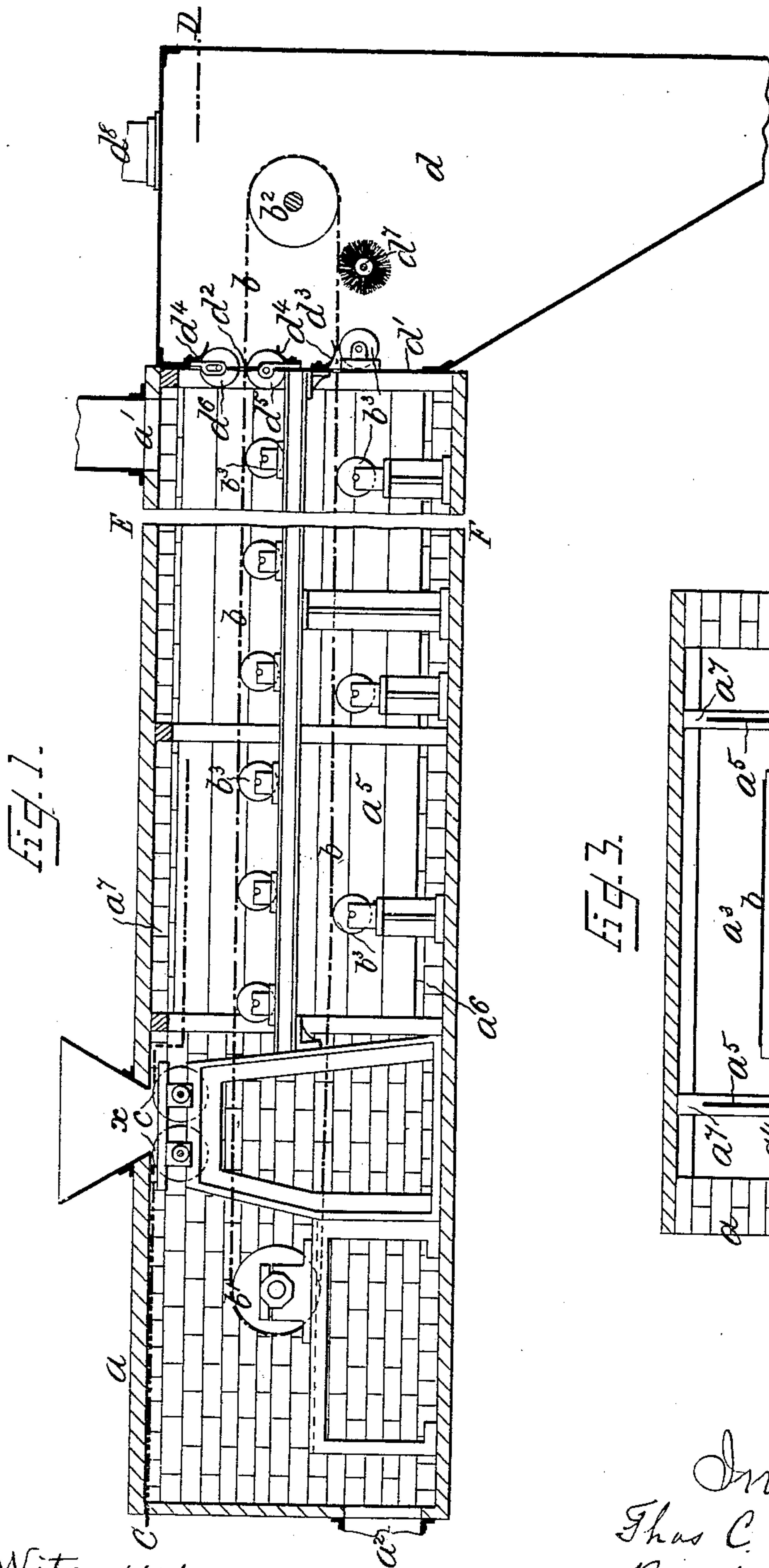
Patented Jan. 24, 1899.

T. C. SANDERSON.
DRIER FOR WHITE LEAD, &c.

(Application filed Feb. 8, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.
J. Chebet.
J. Hennkamp

Inventor.
Thos C. Sanderson,
By *W. H. de Vries*
Attorney.—

UNITED STATES PATENT OFFICE.

THOMAS CRISP SANDERSON, OF LONDON, ENGLAND.

DRIER FOR WHITE LEAD, &c.

SPECIFICATION forming part of Letters Patent No. 618,236, dated January 24, 1899.

Application filed February 8, 1897. Serial No. 622,405. (No model.)

To all whom it may concern:

Be it known that I, THOMAS CRISP SANDERSON, a subject of the Queen of Great Britain and Ireland, and a resident at Upton Manor, London, England, have invented certain new and useful Improvements in Apparatus for Drying White Lead, Colors, and other Powdery, Granular, or Nodular Substances, of which the following is a specification.

10 This invention relates to the drying of white lead, colors, and other powdery, granular, or nodular substances, (hereinafter referred to as "white lead;") and it consists of an improved arrangement of apparatus designed to effect such purpose and characterized by the combination of a central chamber (hereinafter referred to as the "drying-chamber") through which the white lead is slowly traversed and is meanwhile subjected to the drying action of heated air (hereinafter referred to as the "drying-air") traveling in a reverse direction and side chambers (hereinafter referred to as "reheating-chambers") which communicate with the drying-chamber at the lower and upper parts thereof and serve to reheat the drying-air as it becomes cooled by evaporating moisture from the white lead and descends to the lower part of the drying-chamber and passes into the reheating-chambers, causing it to reënter the drying-chamber at its upper part in a reheated state, and so on repeatedly, whereby an effective drying action is obtained and the apparatus is caused to work much more economically.

35 On the accompanying drawings, Figure 1 represents a sectional elevation on A B, Fig. 2. Fig. 2 represents a sectional plan on C D, Fig. 1; and Fig. 3 represents a sectional elevation on E F, Fig. 1.

40 a is a main chamber within which the drying and reheating operations are effected and which may be made of any desired length, according to the nature of the substance intended to be treated therein. At the upper part of one end the chamber is formed with an inlet a' for the hot drying-air, and at the lower part of the other end it is formed with an outlet a'' for the air laden with moisture evaporated from the white lead. For the greater part of its length the chamber is partitioned off into the said drying-chamber a^3 and reheating-chambers a^4 by brattices a^5 , which ex-

tend from near the floor to near the roof of the chamber a , leaving bottom and top passages a^6 a^7 between the chambers a^3 a^4 , the latter of which are closed at the ends, as at a^8 .

Each of the chambers a^4 is independently heated to a temperature equal to or exceeding that of the drying-air supplied to the chamber a^3 by steam-heated gill-fitted pipes a^9 , (or by any other suitable means,) arranged at the lower part of the chamber, steam being admitted to the piping by a connection a^{10} at any convenient part or parts of its length. The pipes a^9 may be duplicated or made with greater radiating-surface toward the ends of the chamber at which the moist white lead is introduced, so as to raise the temperature of the drying-air as it travels along the chamber a^3 and meets wetter material.

The white lead is carried through the chamber a^3 on a slowly-traveling endless web (or webs) b , which at the supply end is mounted on an adjustable roller b' , and at the discharge end is mounted on a driving-roller b^2 , to which a slow rotary motion may be communicated by any convenient means, and at its intermediate part is supported by rollers b^3 .

The inlet x for the white lead is fitted with steam-heated rolls c , by which the white lead is fed onto the web b in a flaked state and in a sufficiently heated condition to prevent moisture from the vapor-laden drying-air it meets from depositing on it.

In the operation of the apparatus the hot drying-air supplied to the chamber a^3 flows in a gentle current over the slowly and reversely traversing layer of white lead carried by the web b , and as it gets cooled by evaporating moisture from the white lead descends over the edges of the web to the lower part of the chamber a^3 and flows thence through the passages a^6 into the chambers a^4 , wherein it is then reheated by the steam-piping a^9 and is caused to ascend within such chambers and to reënter through the passages a^7 the chamber a^3 , wherein it again descends onto the white lead, and as it is again cooled by evaporating further moisture therefrom again descends into the chambers a^4 and is again reheated, and so while traveling from end to end of the chamber a^3 it is caused to circulate in a circuitous course through the cham-

bers a^3 a^4 alternately, being repeatedly reheated sufficiently to maintain its drying capacity throughout its course until it passes beyond the inlet of the moist white lead, when
 5 it descends to its outlet a^2 , whence it is led to a chimney.

The repeated reheating of the drying-air, so as to maintain its drying capacity throughout its course, is of particular advantage in
 10 the drying of white lead and other substances the dust of which is injurious or obnoxious, as it enables the drying treatment to be carried out in a long continuous chamber, through which the white lead may be slowly
 15 traversed without being disturbed either by the traversing apparatus or by the drying-air and without any of its dust being raised within the chamber, in consequence whereof the chamber itself is kept free from dust and
 20 may be entered by workmen with impunity, and the effluent moisture-laden air is discharged at the outlet a^2 free from dust, and consequently the dangerous nature of the operation is considerably lessened. With the
 25 same object provision is also made for enabling the dried white lead to be discharged without any of its dust being drawn back into the chamber, and to this end the chamber is fitted with a discharging-hopper d , which is
 30 separated therefrom by a plate d' , having openings d^2 d^3 for the outward and return passage of the web b , protected by aprons d^4 , the opening d^2 , through which the web carrying the dried white lead issues from the drying-chamber into the hopper, being further
 35 protected by being fitted with a roller d^5 for supporting the web and with a loosely-mounted roller d^6 , which rests lightly upon the issuing dried white lead and accommodates any
 40 irregularities in the thickness thereof, rolling the same down and preventing any dust being raised as the white lead issues from out of the drying-chamber. The hopper is also connected by a passage d^8 with a stithe-
 45 chamber, (not shown,) through which by means of an attached fan or the like a sufficient current of air may be caused to flow from the hopper to counteract any tendency of the current of drying-air through the drying-chamber to draw any dust from the hopper
 50 thereinto. The returning part of the web is freed from any adhering particles of the white lead by a revolving brush d^7 , driven from the roller b^2 .

55 It is not essential that the white lead should be traversed through the drying-chamber on a traveling web, as a series of trays or other suitable carrying means may be used for the purpose.

60 When the improved drying apparatus is adapted to the drying of tea-leaf and other

materials of an innocuous nature, it is not necessary to so completely close off the discharging-hopper from the drying-chamber or to connect the same with a stithe-chamber
 65 and exhaust apparatus, and the material may be otherwise heated than by the rolls c before being admitted to the chamber a^3 .

What I claim as my invention, and desire to secure by Letters Patent, is— 70

1. In a drying apparatus, the longitudinally-extending drying-chamber provided at each side with reheating-chambers in communication with the drying-chamber at top and bottom throughout the length of the chambers, a receiving-hopper at one end of the drying-chamber, the endless carrier passing through the drying-chamber and into said hopper through openings in a wall separating the drying-chamber and hopper, and aprons
 80 protecting the openings through which the endless carrier passes into the hopper and back into the drying-chamber, substantially as and for the purposes described.

2. In a drying apparatus the longitudinally-extending drying-chamber provided at each side with reheating-chambers in communication with the drying-chamber at top and bottom throughout the length of the chambers, a receiving-hopper at one end of the
 90 drying-chamber, the endless carrier passing from the drying-chamber into the hopper through openings in a wall separating the drying-chamber and hopper, rolls located beneath the endless carrier at the openings where it
 95 passes into the hopper and back into the drying-chamber, and a roll above the carrier where it passes from the drying-chamber into the hopper, substantially as and for the purposes described. 100

3. In a drying apparatus, the combination of the longitudinally-extending drying-chamber, reheating-chambers on both sides thereof and communicating therewith at both the top and bottom of the chamber throughout
 105 the length of the drying and reheating chambers, a hot-air inlet at one end of the drying-chamber and an air-exit at the opposite end, a receiving-hopper at one end of the drying-chamber, an endless traveling carrier passing
 110 through the drying-chamber and into said hopper, an inlet for the material at a point in the drying-chamber above the endless carrier, and heated rolls at said inlet between it and the endless carrier, substantially as and
 115 for the purposes described.

Signed at London, England, this 13th day of January, 1897.

THOMAS CRISP SANDERSON.

Witnesses:

CHARLES AUBREY DAY,
 ALFRED CHARLES DAY.