

CALKINS & WHITE.

Lime Kiln.

No. 20,549.

Patented June 15, 1858,

Fig. 1,

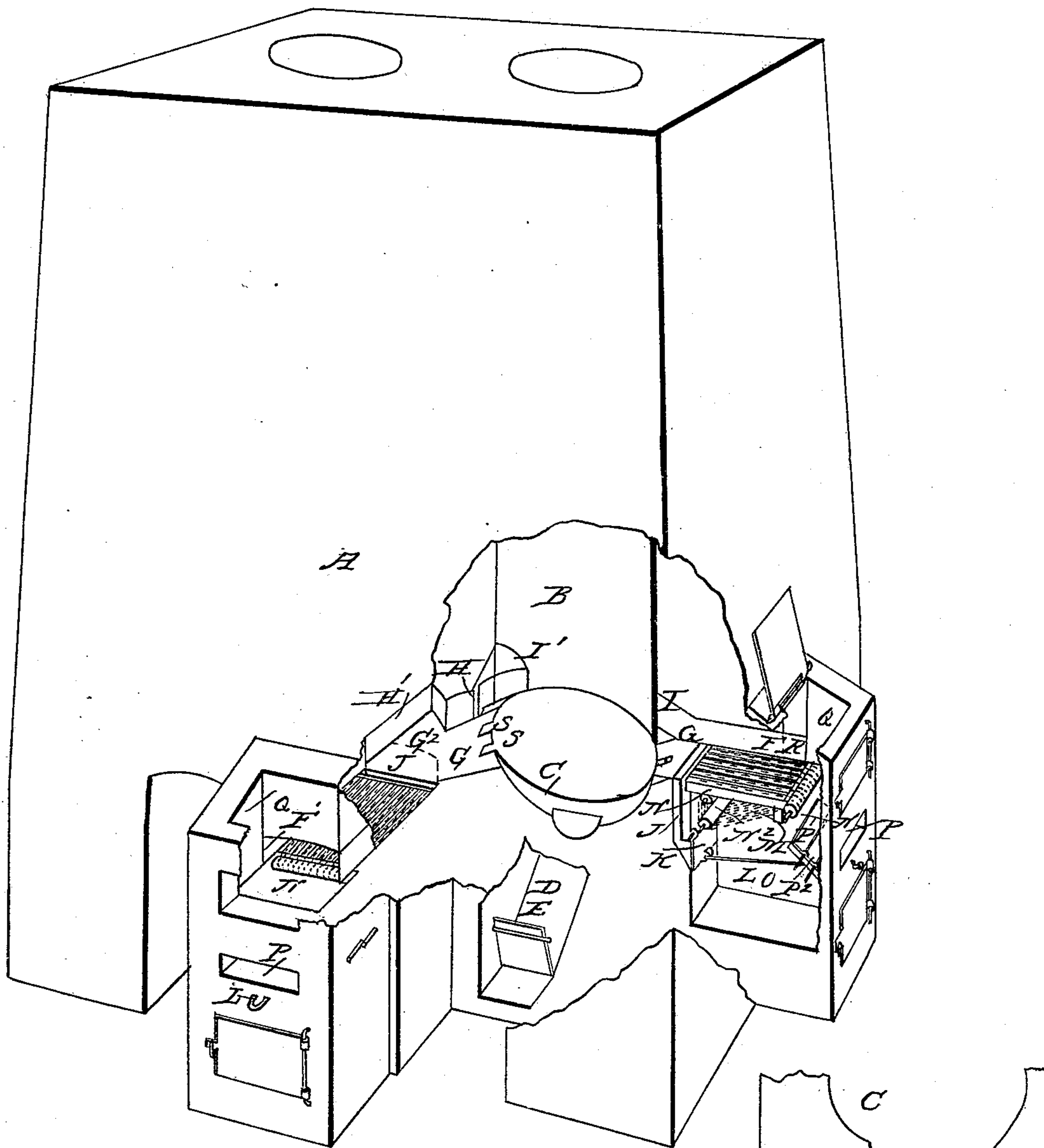
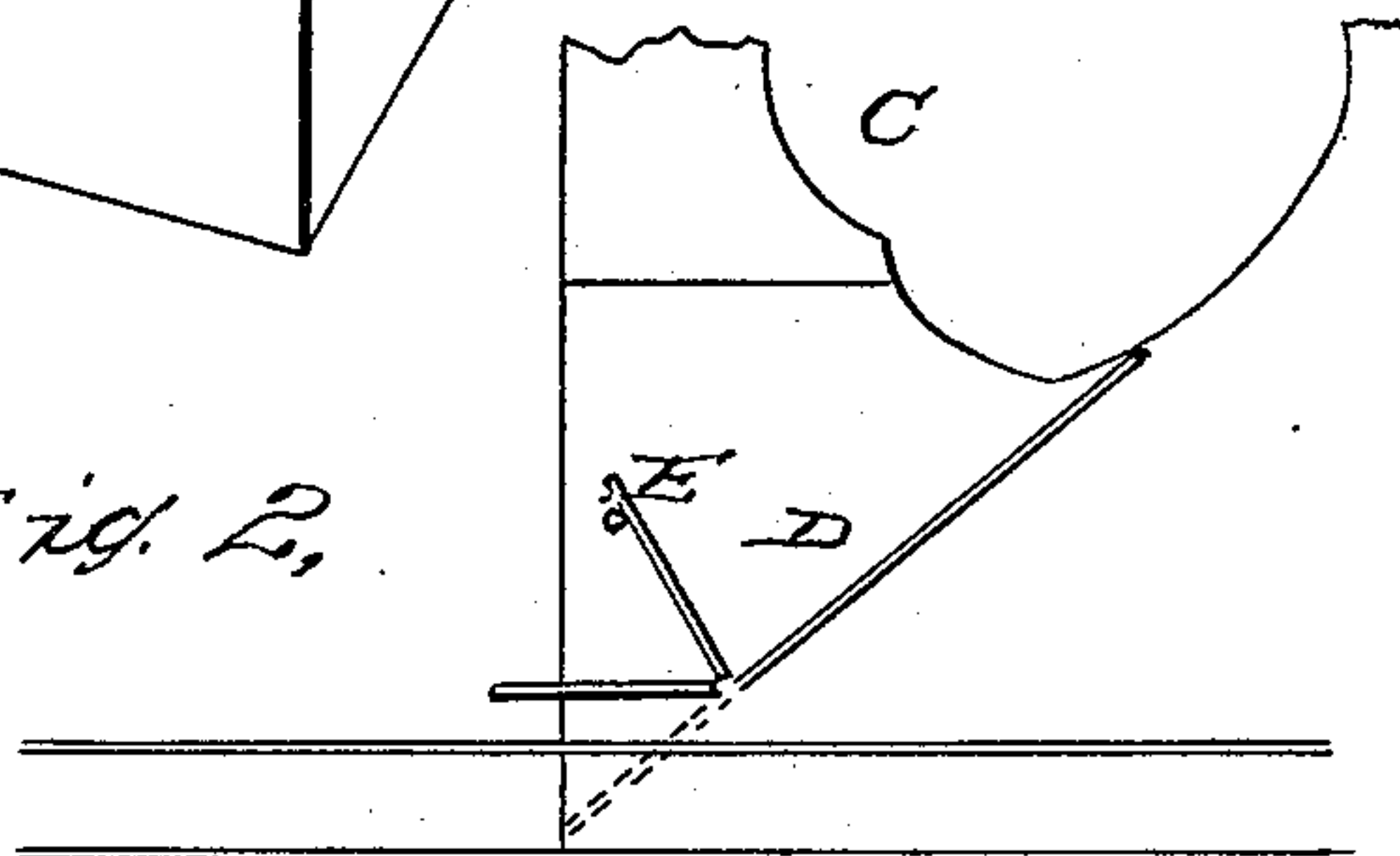


Fig. 2,



Witnesses:
 Charles H. Salmon
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 Henry White

UNITED STATES PATENT OFFICE.

G. W. CALKINS AND H. WHITE, OF CLEVELAND, OHIO.

LIMEKILN.

Specification of Letters Patent No. 20,549, dated June 15, 1858.

To all whom it may concern:

Be it known that we, GEORGE W. CALKINS and HENRY WHITE, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Limekilns; and we hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification.

The nature of our improvement consists in the arrangement of the several parts of a lime kiln in the manner hereinafter described.

Figure 1 is a perspective view; and Fig. 2 a section of the hopper and a chute draw.

A is the stack with parts removed to show the internal arrangements, B the cupola, C the hopper, D the chute draw, the bottom of which must be lined with a cast iron plate to have a flap about two and a half feet long hinged to the lower end and made to turn up and form a check to stop the lime on the chute when the draw is closed; the flap may be arranged to set level when down to shovel on, or arranged to fall to the same line of the chute when the height of the kiln will admit of it: the arch of the draw is to be horizontal, cutting through the hopper wall and forming a check to throw the lime on each side of the chute; F the end furnaces, F' the central furnace, the side walls to which will be one foot high and covered with a segmental arch of not over two and a half inches rise. P the cold air duct which will enter the ash-pit directly under the grate and have two or more dampers so adjusted as to discharge the blast at the front end of grate and also under it in such quantity as may be required, the duct to extend out from the kiln to such distance and to be of such a size as may be required to obtain a natural draft, or adjusted for a blower as may be found necessary. O the ash-pit which must be not less than four and a half feet deep, the door to which must have a cold air draft in it, provided with a suitable cover; J an ash and cinder flue which discharges into the ash-pit about two feet above the floor thereof with a damper K over the mouth to which the rod L is connected and by which it is to be opened and closed. The rod will extend through and to the outside of ash pit with suitable checks thereon for the purpose required. G G' and

G² the mouths of the furnaces, which are to be constructed diagonally so as to throw the flames to one side of the cupola, and also with an upward inclination as at I and I' to give it an upward course so that in circulating around the cupola the flames will pass over the furnace on the opposite side and not check the draft thereof, and also for the purpose of distributing the fire uniformly through the cupola, the angles to be set so as to divide the kiln equally from the center.

H and H' are dampers of the central furnace for the purpose of cutting off the fire from either cupola when the lime is to be drawn or when one cupola is to be withdrawn from use. The dampers are to be made of fire stone, fire clay, or any other fire material to be properly constructed and clamped with iron and made to slide in the wall back of the furnace chamber into an opening made for that purpose; they will slide on the hearth, and the top into a rabbet formed by starting the arch of the mouth of furnace about one inch higher than the arch of the furnace. The dampers are to be worked by an iron rod attached to the back end, which will extend through to the back-side of kiln from where they are to be worked. Q the hoppers by which the coal is fed to the furnace. They are to be of any convenient height and covered with a lid properly adjusted and made to fit close. There will be a feed chute R at the bottom of hopper geared to regulate the feed to the grate; S pillars to support the arches of the mouth of the furnace when heated, also to prevent the lime and stone from falling therein.

All the openings into the kiln must have close fitting iron doors in iron frames to be well secured. Peep holes are to be made at such points and in such number as may be required for a proper observation of the charge when burning and for cutting it down when drawing the lime.

In operating the furnaces, the coals being fed to and kindled at the front end of the grate, as they become coked, are from time to time to be shoved forward so as to cover the whole length of grate. The combustion of the coal when moved forward is to be kept up by the cold blast by which and by giving a low arch to the furnace we expect to consume the smudge arising from the

freshly ignited bituminous coal as the flames are forced to pass over the burning coke in its passage to the cupola and for this purpose the furnace and grate, are made of a length that otherwise would be unnecessary for the purpose intended. The cinders and ashes that may be carried over the grate will fall into the ash-pit through the flue J, which flue is also intended for conducting the heat from the burning cinders in the ash pit up to the main current of flame in its passage to the cupola. The combustion of the cinders is to be kept up by means of a cold air draft let in through the ash pit door. When the lime is to be drawn from either cupola the damper of the central furnace upon that side is shoved forward over the mouth of the furnace by which the fire is turned into the opposite cupola, and when the lime is drawn and the charge brought down, the damper is drawn back and the fire again admitted, when the oppo-

site cupola may be drawn in the same manner.

We do not claim any of the parts separately but

What we do claim and desire to secure by Letters Patent, is—

The arrangement of a lime kiln, or parts of a lime kiln as herein described; that is to say, the arrangement of the furnaces F' and F' provided with diagonal mouths G, G', G² in combination with the dampers H, H' and K, the ash-pits O, the cold blast aperture P, the flue J, and a hinged chute draw D, when the several parts are constructed, and arranged with relation to each other, as described, and operating in the manner and for the purpose set forth.

GEORGE W. CALKINS.
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Witnesses:

C. W. PALMER,
JAMES B. PARISH.