

C. B. COREY.

Lime-Kilns.

No. 133,925.

Patented Dec. 17, 1872.

Fig. 1.

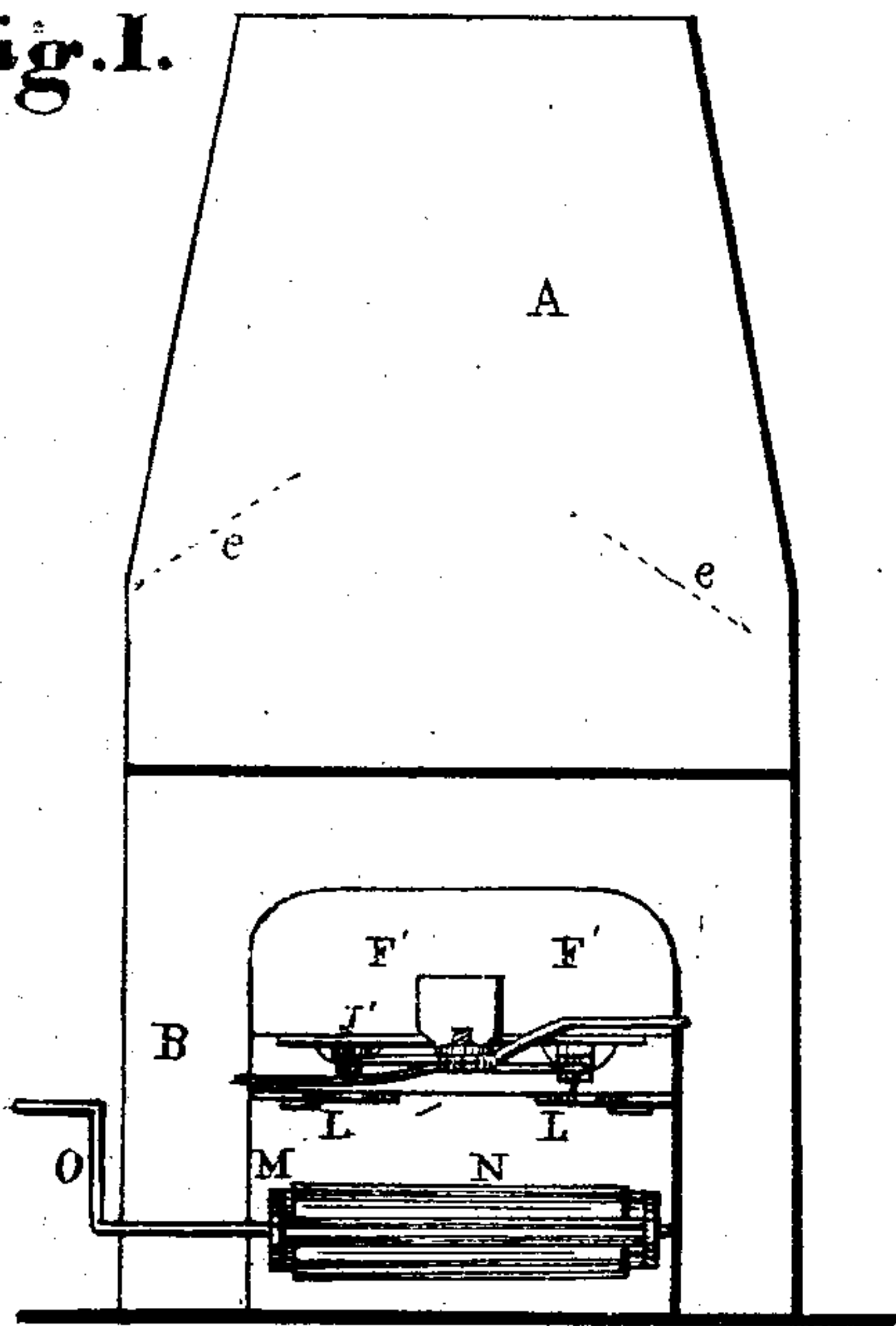


Fig. 3.

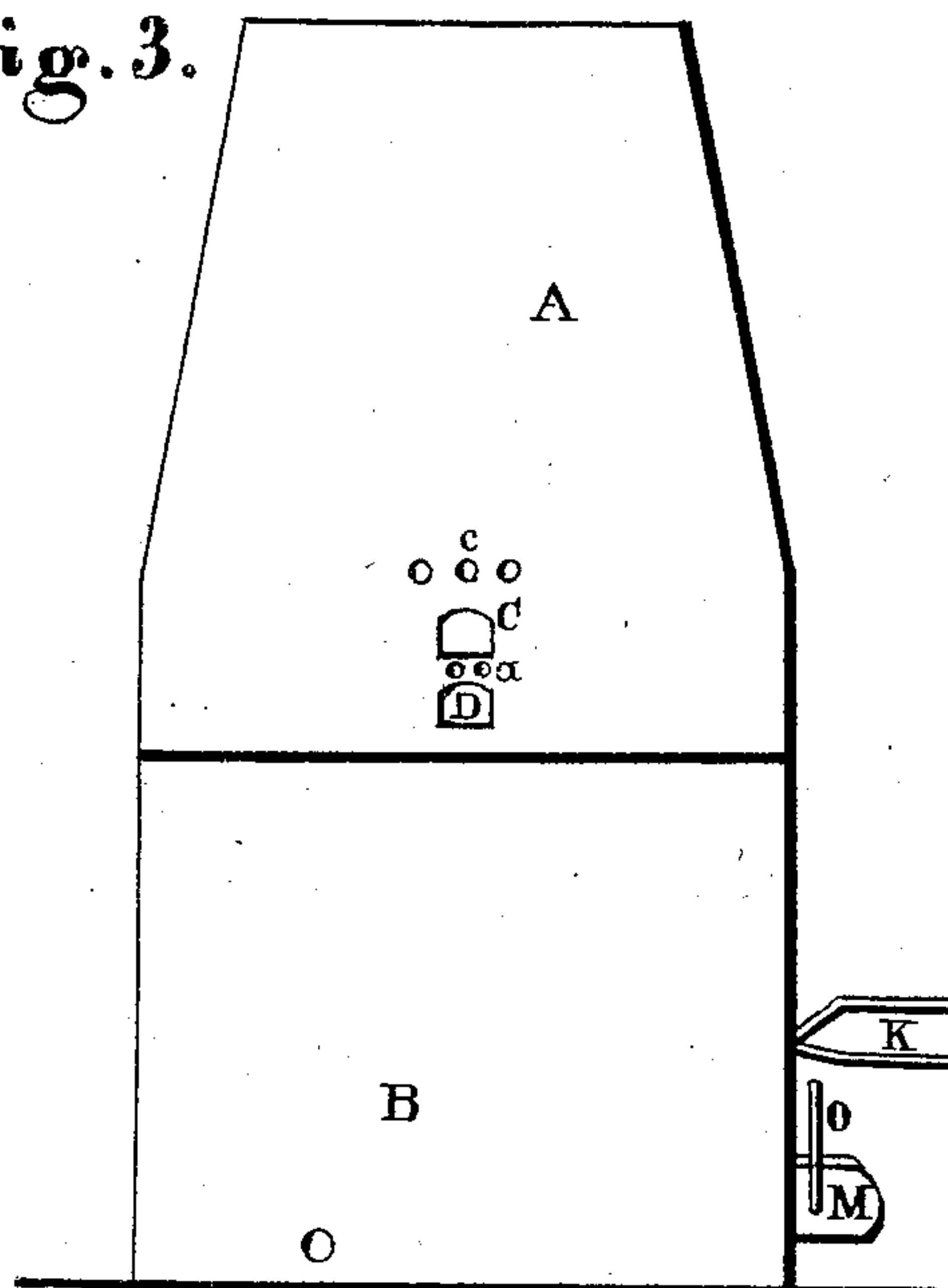


Fig. 2.

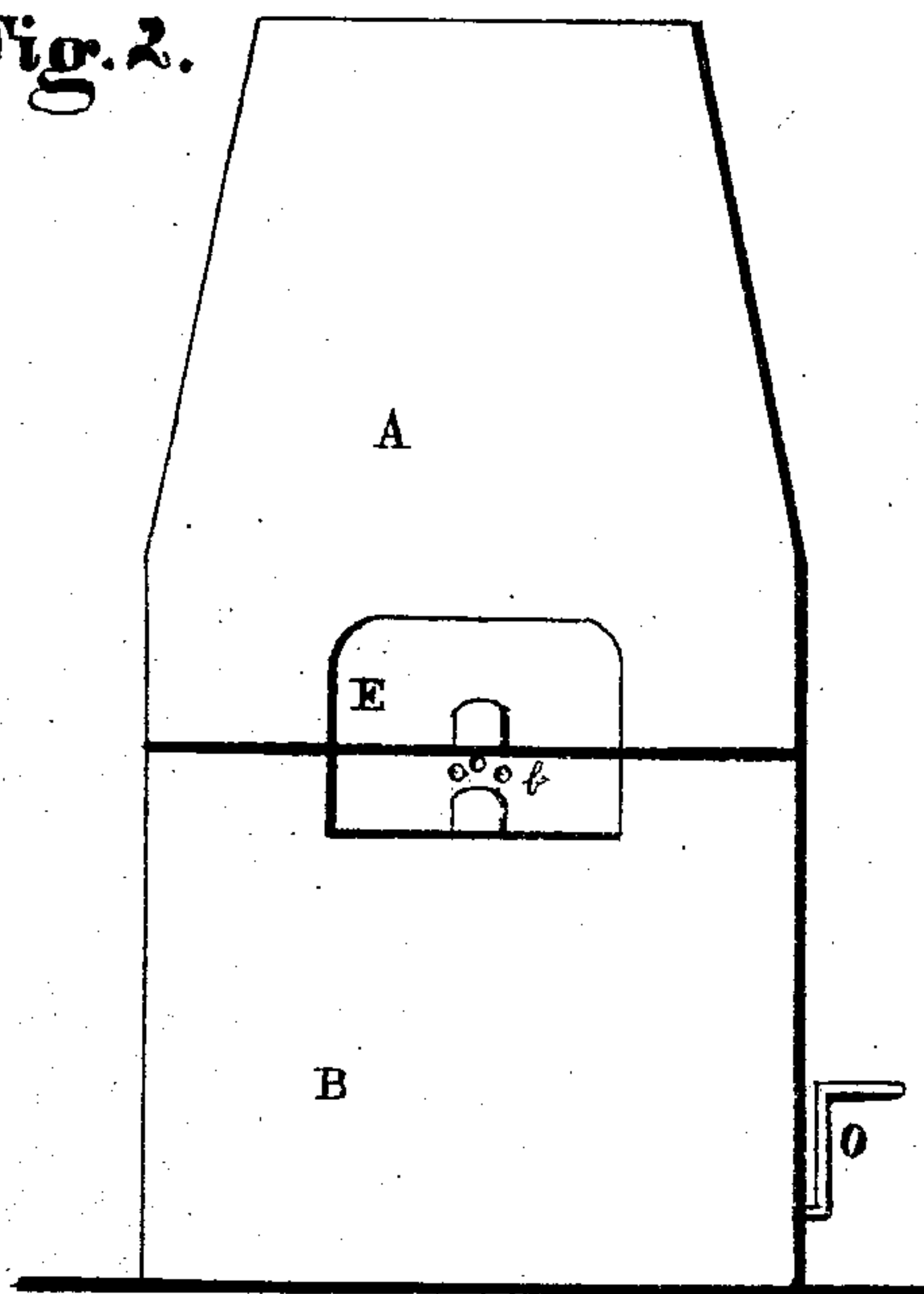
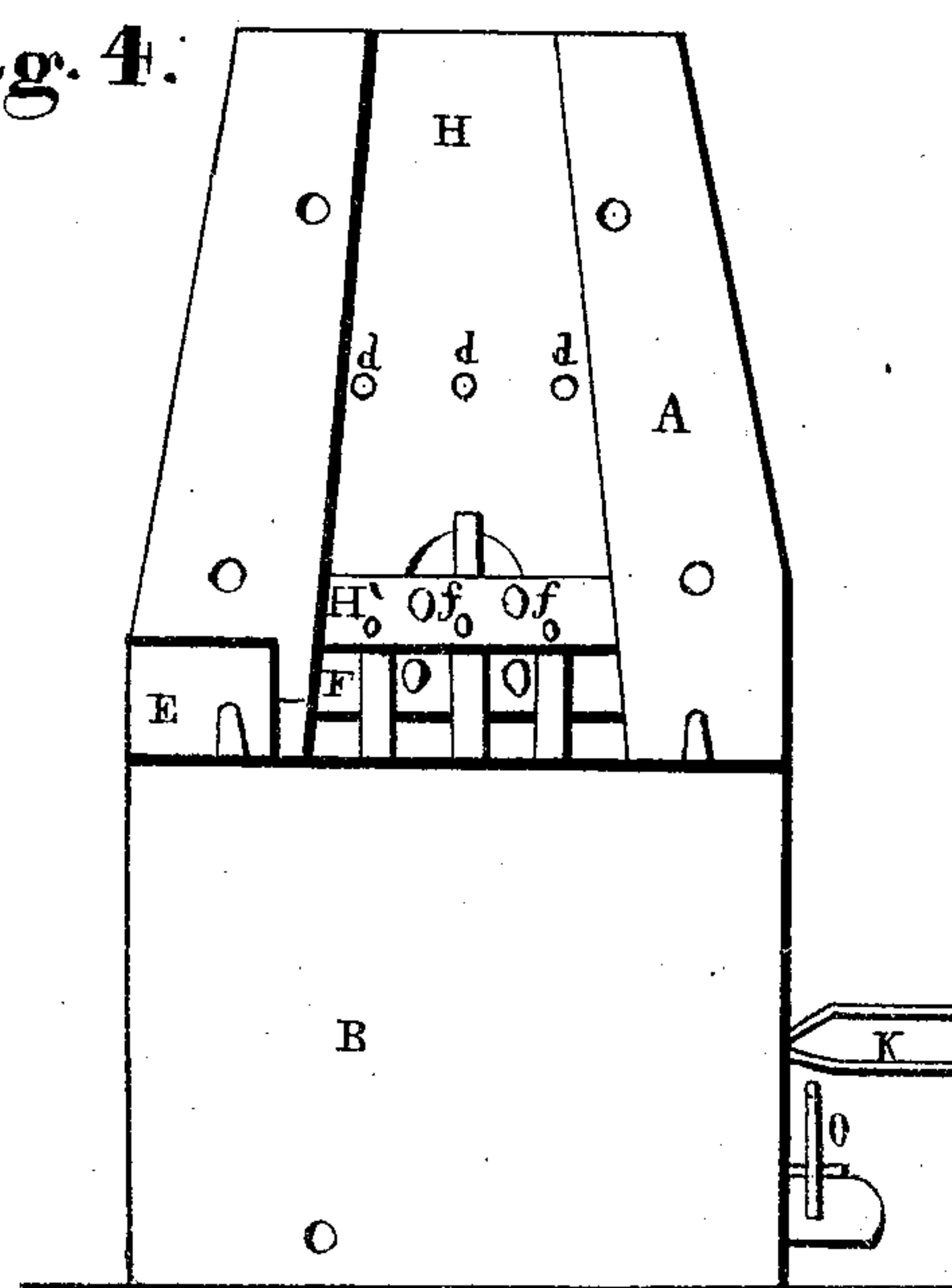


Fig. 4.



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Fig. 5.

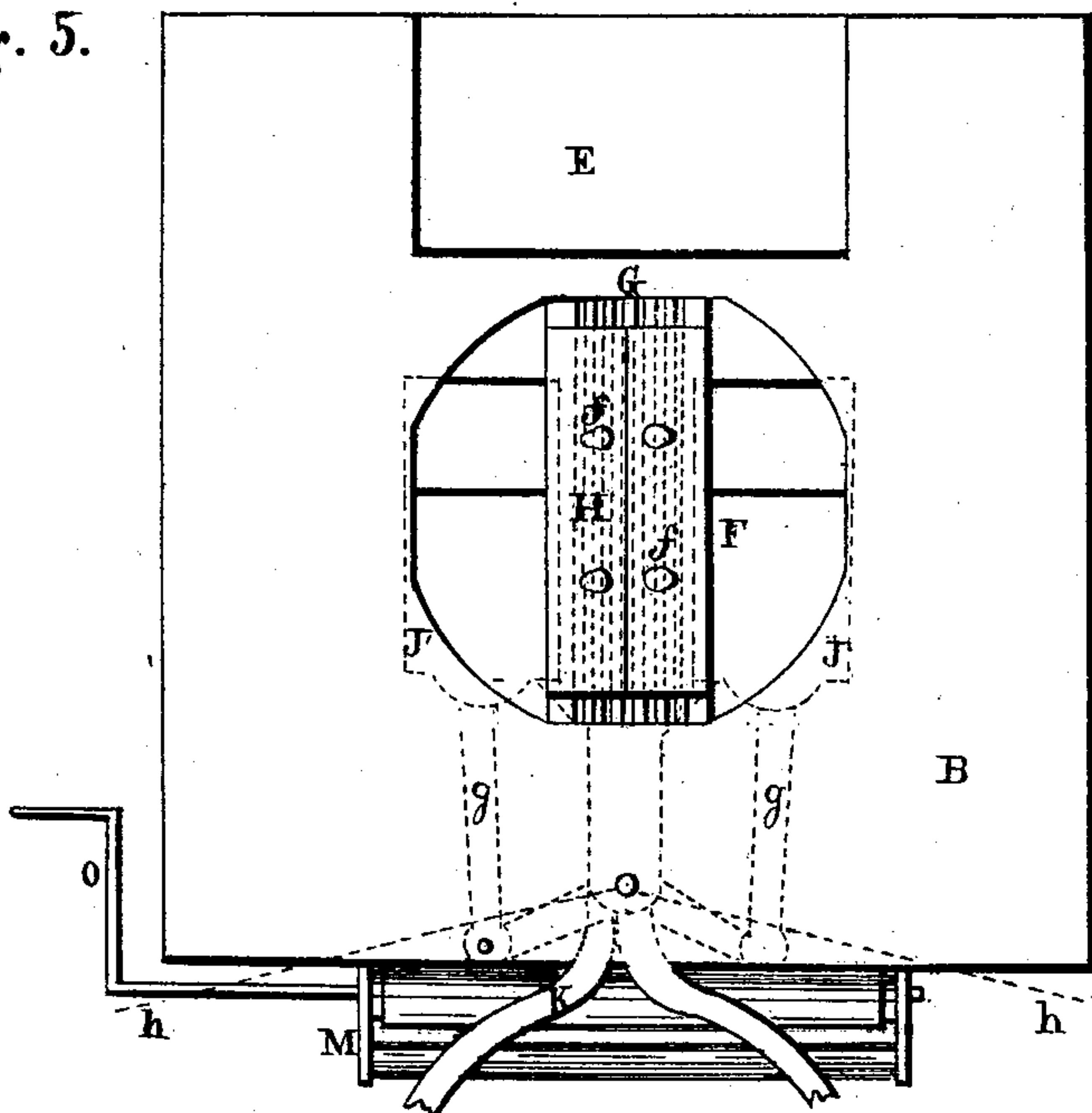


Fig. 6.

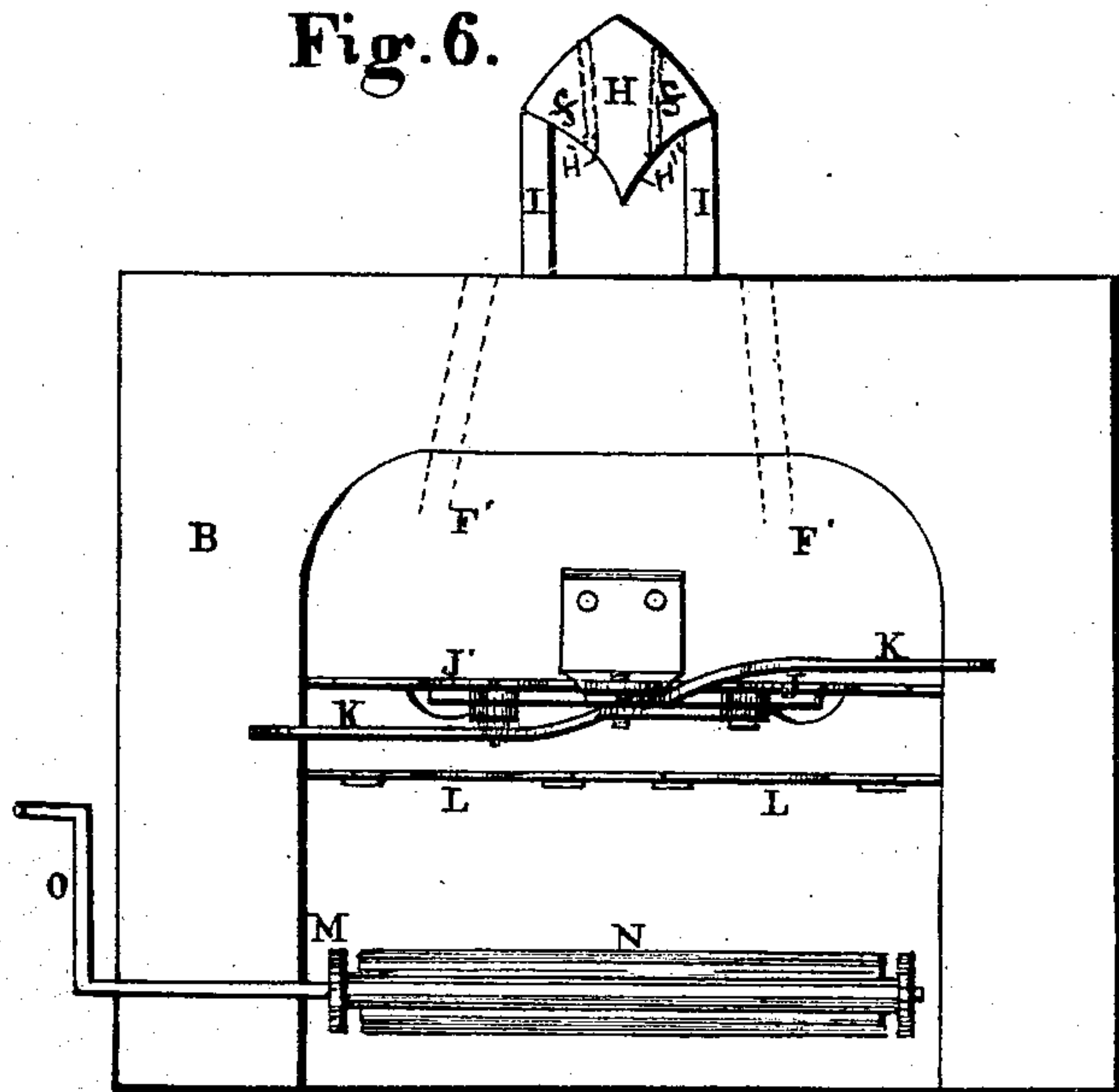
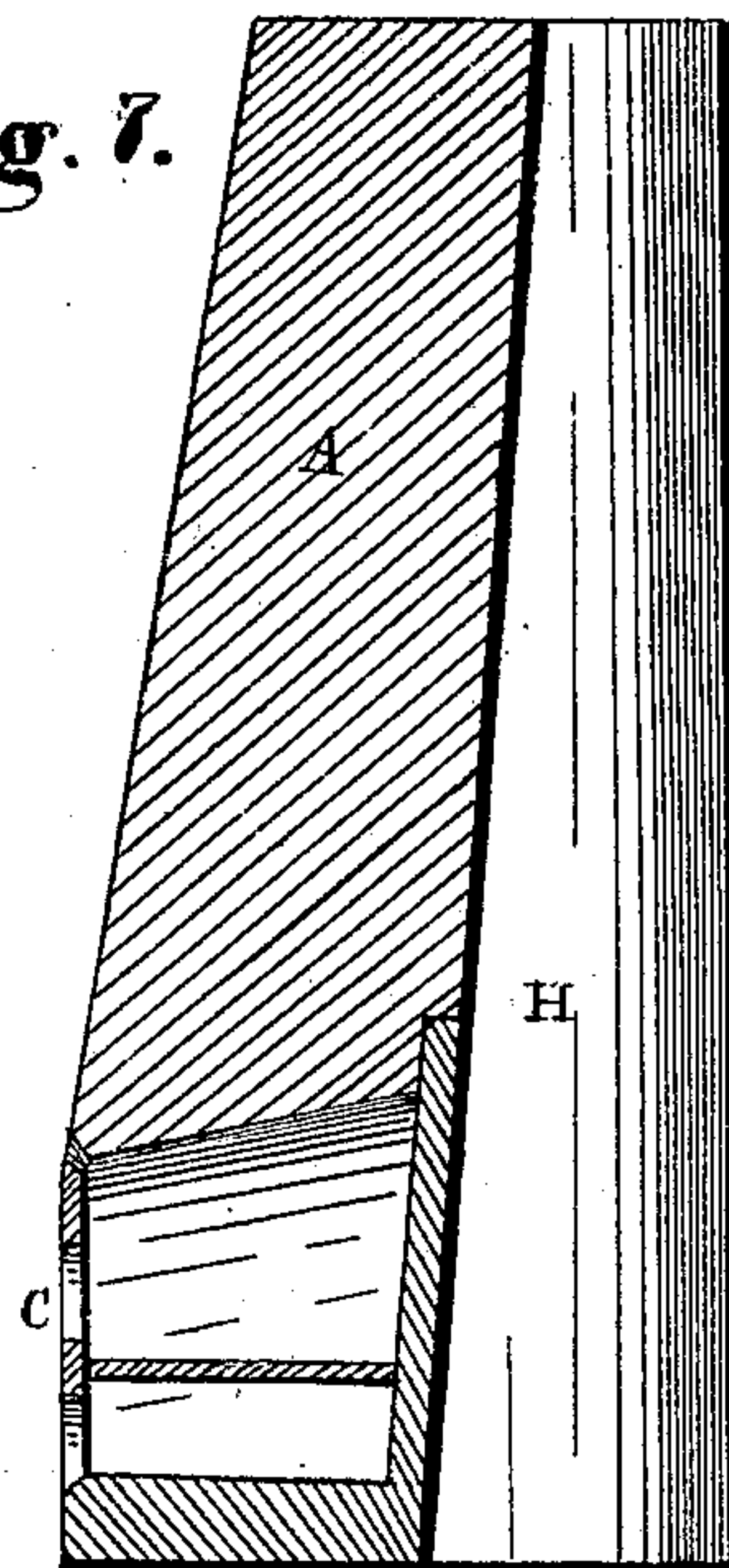


Fig. 7.



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UNITED STATES PATENT OFFICE.

CHARLES B. COREY, OF CLEVELAND, OHIO.

IMPROVEMENT IN LIME-KILNS.

Specification forming part of Letters Patent No. 133,925, dated December 17, 1872.

To all whom it may concern:

Be it known that I, CHARLES B. COREY, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and Improved Lime-Kiln, of which the following is a description:

Figures 1, 2, and 3, are side elevations of the lime-kiln. Fig. 4 is a view of the inside of the shaft or cupola of the kiln. Fig. 5 is a plan view of the base or lower section. Fig. 6 is a side view of the lower section. Fig. 7 is a detached section.

Like letters of reference refer to like parts in the several views.

The nature of this invention relates to a lime-kiln; and the object of the same is to cause an equal diffusion of heat through the cupola, so that the lime or stone can be uniformly burned, and in devices for more readily removing the burned lime.

In the drawing, A represents the cupola or shaft of the kiln, and B the base, in which is the furnace and pit from which the lime is removed. In the lower part of the cupola, and immediately above the base, is a furnace, C, Fig. 3, of which D is the ash-pit. Immediately under the grate are air-holes *a* for the admission of cold air to the grates when the door of the ash-pit is closed. A furnace, corresponding to the above in construction, is in the opposite side of the cupola, and for a similar purpose. It will be observed, on examination of Fig. 7, that the roof of the above said furnaces is arching and slants upward inwardly, as shown. Directly above the mouth of the furnace are air-flues *c* penetrating the wall of the cupola to the arch of the fire-place. Said flues are also made to communicate with the flues *d*, Fig. 4, opening into the flue or shaft H of the stack. Said flues are indicated by the dotted lines *e*, Fig. 1. E, Figs. 2 and 5, is the mouth of the large central furnace F, of which G, Fig. 5, are the grates, immediately beneath which are air-holes *b* for the admission of cool air to the under side of the grate when the furnace-door is closed, and also to furnish a small draft to the furnace. F' are flues for the admission of air to the central furnace. Arranged lengthwise above the grates is a deflection, H, an end view of which is shown in Fig. 6. The under sides H' H' of said deflection are concave, as shown in said

Fig. 6, and which is also supported on standards I arranged on each side of the grates. Vertically through the deflection are flues *f*. The purpose of said deflection will presently be shown. J J', Fig. 6, are a pair of sliding draws. Said draws are attached to one arm of the lever K by means of a link, indicated by the dotted lines *g*, Fig. 5, and which also indicate the draws. Said draws are worked backward and forward by the levers, for a purpose presently shown. Immediately below the draws are a pair of slides, L, Fig. 6. The relative position of the slides to the draws is such that, when the draws are drawn out for opening the bottom of the kiln, the slides will close the opening, for a purpose hereinafter shown. M, Fig. 5, is a frame, in which are journaled rollers, over which is run a metallic endless apron, N. Said apron and rollers are operated by a crank, O.

Thus far having described the construction and general arrangement of the kiln, the practical operation of the same is as follows: In kilns, as ordinarily constructed, the stone is not evenly burned; hence results an unevenness in the lime—some being wholly burned, while some is but partially so, and, therefore, of poor quality. This difference is due to the want of a uniformity in the heat of the kiln, it not being evenly diffused through the mass of stone with which it is charged, in consequence of a defective construction. To avoid this defect and cause a more evenly diffused heat throughout the burning mass is the object of my invention, and this I accomplish, in part, by the deflector H, which, as above described, is raised above the fire and directly over it. In consequence of the curved under surfaces of the deflector, the heat, instead of passing directly upward through the stone, is deflected sidewise into it, thereby causing as much heat at the sides of the charge as there is above, the result of which is a more uniform burning of the charge, and, consequently, a more even and better quality of lime. Although much of the heat is thrown to the sides of the furnace, yet it is not excluded from the charge immediately over the deflector, that part of the charge being supplied with a proportionate amount of heat by the flues *f*, through which the heat directly ascends into the central portion of the charge, while a certain

amount thereof is deflected to the sides, as and for the purpose aforesaid. To aid in the reduction of the charge by increasing and sustaining the heat above the deflector the flues *c*, Fig. 3, are introduced for conducting air from the outside to the interior of the cupola, which, as it passes through the thick and heated walls thereof, becomes hot thereby, not only supplying additional heat to the charge, but also heated air to support and cause a more complete combustion of the unconsumed gases which arise in the furnace and pass up through the charged cupola, thus utilizing the waste gases in generating of heat, while the flues *b* admit cool air to the grates, thereby preventing them from being rapidly burned out, as aforesaid. The side furnaces *C*, referred to, in consequence of their arching and slanting construction, as above described, throw the heat in direction of and toward the arch or deflector *H*; thus the fire is directed from the furnace *C* toward the opposite side of the cupola, at or about the flues *d*, whereas the corresponding furnace on the opposite side of the kiln throws its heat in the opposite direction, thus producing a cross-fire, thereby intensifying the heat and causing a rapid and complete burning of the charge, which settles down about the central furnace and lodges upon the draws *J J'*, by which the lime is removed as follows: On pushing the handles or levers *K*, Fig. 5, to one side, as indicated by the dotted lines *h*, the draws are drawn out, (the slides *L*, immediately below them, first having been pulled forward,) the lime will then fall through the bottom of the kiln upon the apron *N*, which, on being made to revolve, carries the lime forward and out from the pit, from whence it

falls into a wagon stationed under the outer end of the revolving apron to receive it. By this means much time and labor are saved in handling the lime, and, furthermore, it prevents it from being broken up, which it is liable to be when much handled. The slides *L*, referred to, are for the purpose of shutting off the cold air in the event that any stone or piece of lime should be caught between the end of the draws and the back of the kiln, against which they slide into place and preventing the draws from being closed tight. In such case the slides *L* are used to close the opening caused by such clogging up of the draws, thereby preventing cold air from passing up into the cupola. In this position the slides remain until the next discharge of lime, which would remove the obstruction along with the discharging lime.

Claims.

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

1. The draws *J J'* and levers *K*, arranged in the bottom of the kiln, in combination with the slides *L L*, all constructed and arranged substantially as and for the purpose set forth.
2. The draws *J J'* arranged in the bottom of the kiln and the endless metallic apron *N*, all constructed and arranged for operation, as and for the purpose specified.
3. The furnaces *C* and *F*, arranged as described, and provided with the air-inducts, thus: In *E* at *b*, and in *C* at *a* and *c*, all as and for the purpose described.

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Witnesses:

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