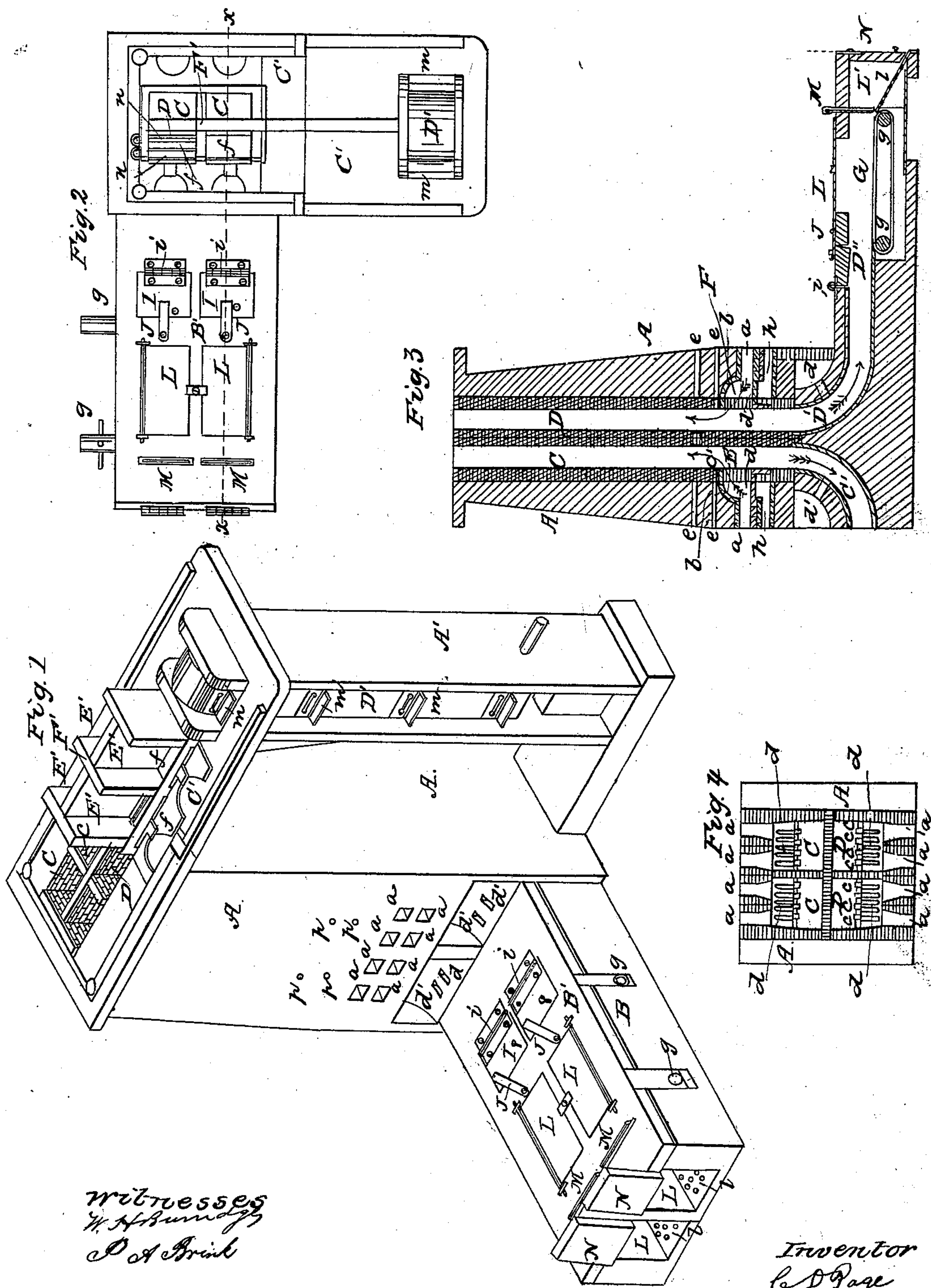


C. D. PAGE.
Brick Kiln.

No. 42,106.

Patented March 29, 1864.



UNITED STATES PATENT OFFICE.

C. D. PAGE, OF GRAND RAPIDS, MICHIGAN.

IMPROVEMENT IN BRICK-KILNS.

Specification forming part of Letters Patent No. 42,106, dated March 29, 1864.

To all whom it may concern:

Be it known that I, C. D. PAGE, of Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Brick-Kilns; and I do hereby declare that the following is a full and complete description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is an isometrical view. Fig. 2 is a top view. Fig. 3 is a vertical section in the direction of the line *xx* in Fig. 2. Fig. 4 is a transverse section across the furnaces.

Similar letters of reference indicate the same parts in the several views.

In Fig. 1, A represents the stack, and B an extended end of the kiln, the internal structure of which is shown in Fig. 3, C and D representing the cupolas, of which there may be one or more. In this design there are four in two separate rows, which in practical operation would require another extended end similar to B on the opposite side from B; but as they are alike in construction and operation the representation of one end is sufficient to illustrate it.

E and F are the furnaces, on opposite sides of the stack above the extended end B, communicating with the cupolas C and D, the heat passing through the openings or flues *c*, as shown in Fig. 4, up into the cupolas, as indicated by the arrows *c'*.

b b are the arches of the furnaces; *a*, the feed-flues; and *d*, the grates into the ash-pits *h*, a transverse section of which is shown in Fig. 4. The cupolas extend down from the top vertically till about three feet (more or less) below the furnaces, and curve round into the extended ends, forming chutes C' D'. The cupolas D, curving round in one direction into the end B, and the cupolas C in the opposite direction, to enter an extended end at that side. The chute D' of the cupola D passes over an endless metallic apron, G, arranged on the shafts *g g*. These shafts extend through the end B, on which can be placed one or more endless belts, according to the number of cupolas, all being operated by turning one shaft, which is the controlling power for drawing any quantity of bricks required.

I J are spring-breaks, hinged at *i* to the top B' of the end B, J being the metallic

springs. These breaks diminish the size of the openings of the chutes D', as shown at D'', to retard the motion of the bricks as they come down from the cupolas.

L L are lids on the top to gain access to the inside.

M M are dampers that can be raised or lowered, opening or closing the ends of the chutes, and that open into the air or cooling chambers L', the lower sides, *l*, of which are inclined downward and are perforated, or have flues for the admission of cold air.

N N are doors opening into the cooling-chambers, from which the bricks are taken from the kiln.

A', Figs. 1 and 2, is the elevator, extending up above the platform C', as represented, constructed with an endless apron, D', passing over pulleys above and below, with shelves *m* secured to the apron, on which the bricks are placed that are to be elevated. The platform C' extends over the top of the stack, and on this platform can be placed and moved along the charger F', which must be constructed in proportion to the size and number of the cupolas in the stack.

In each division E' of the charger, corresponding to the cupola, is a slide, *f*, and above this slide are two pins, *n*, on which the bricks are placed as the charger is being filled, but are removed when the bricks are let down into the cupolas. The green bricks are carried up on the elevator to the platform, and the charger can be brought up near the elevator, as shown in Fig. 1, until it is filled with bricks. It is then moved or run along on the platform until the divisions E' of the charger are directly over the top of the cupolas, which are filled with bricks in the process of burning. The slides *f* are then withdrawn, and the pins *n* afterward, so as to let the bricks down into the cupolas gradually, that they may not be misplaced. The pins also keep the bricks in place while the slides are being removed. At the same time that the bricks are passing in at the top of the cupolas the dampers M must be elevated and the same quantity of bricks drawn from the kiln. When the bricks are ready to draw, which the fireman can readily tell by looking in at the peep-holes, elevate the dampers M, put the drawing belts or aprons G in motion, so as to draw the same quantity of brick from the end of the kiln that there is

in the charger at the top. The charger being emptied, it is run back to the elevator, filled and run back again to its place over the cupolas, when the slides *f* are withdrawn, and then the pins *n*, as before described, the brick passing down into the cupolas when the process of burning goes on. It is intended to have two chargers, so that when one is emptied the one that is filled is ready to take its place, so as to lose but little time in burning. The bricks are set up in the chargers for entering the cupolas in the same manner as they are arranged in the ordinary brick-kiln, which allows the heat from the furnaces to pass up through the cupolas, coming in contact with all sides of the bricks and allowing sufficient draft for the furnaces. It is designed to have the chargers with the bricks stand over the cupolas about two hours, and, as one side of each division of the charger is open to the wind, and the heat coming up through the cupolas carries off the "water smoke" from the bricks before they enter the cupolas, when they are prepared to be subjected to a greater heat. Each movement carries the bricks down to a greater degree of heat, until they pass below the furnaces, which are forty-five feet, (more or less,) below the chargers, that require eight movements of two hours each, being about sixteen hours before they pass the furnaces, and as many hours before they are drawn and delivered into the cooling-chambers *L'*, the bricks going through the same gradual process of cooling as of heating. The bricks move down through the cupolas, round the curves, by their own gravity, aided by the aprons *G*, the spring-breaks *I J* retarding the motion of the bricks to prevent them from moving too rapidly and descending from the cupolas faster than is desired or than they are withdrawn, and by means of the drawing-aprons *G* they can be moved along at will. The dampers *M* are raised when the bricks are being taken from the kiln and closed when the charge of bricks are withdrawn, shutting off the draft from the cupolas.

p, Fig. 1, represents peep holes in the stack to look into the cupolas, to know when the bricks are sufficiently burned.

d' are openings to gain access to the chutes *D'* of the cupolas should the bricks become stopped in any way in moving round the curves.

My improvement has many advantages over kilns in ordinary use. The bricks being all alike subject to the same degree of heat, every brick comes from the kiln perfectly burned, which cannot be done by any other method now known or used, and only one-fourth the usual amount of fuel is required. Another great advantage is that the bricks

may be set up in the chargers after being dried only one day, as each charger is only two by four feet wide and six feet high, holding seven hundred and fifty-six bricks, while in other kilns many thousands are required to be set up before the fires are introduced; consequently the bricks must be thoroughly dried on the yard for several weeks, being constantly turned over, and then set up in separate piles to season sufficiently hard, so as to sustain a great weight, requiring a large drying-yard and much labor, in the process of which the bricks are sometimes entirely destroyed by frequent showers of rain, whereas with my arrangement the bricks can be set up in the charger as soon as they are dry enough to handle. The fires in the furnaces can be extinguished and started again at pleasure without drawing out the bricks from the cupolas, and the furnaces are so arranged that the entire heat produced by burning the wood or coal is directly applied to the bricks without in any way coming in contact with them, and from the peculiar construction and arrangement of the cupolas and furnaces the heat cannot escape either while replenishing with fuel or drawing the bricks. The bricks are all alike gradually subjected to a greater degree of heat in passing through the cupolas until they are thoroughly and perfectly burned, and then they pass through a similar process of cooling before they are withdrawn.

In using one or more cupolas the number of chutes and the other operating parts connected therewith will be in accordance to the number of cupolas, more or less, than are herein set forth.

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

1. The charger *F'*, with one or more compartments or divisions, provided with slides *f* and rods *n*, in combination with the cupolas, in the manner and for the purpose set forth.

2. One or more vertical cupolas, *C D*, and metallic chutes *C' D'*, in combination with the furnaces, arranged in the manner and for the purpose set forth.

3. The spring-breaks *I J*, in combination with the chutes, in the manner and for the purpose described.

4. The endless apron *G*, in combination with the chutes and dampers *M*, in the manner and for the purpose set forth.

5. The air-chamber *L'*, in combination with the chute and damper *M* and apron *G*, as and for the purpose specified.

C. D. PAGE.

Witnesses:

W. H. BURRIDGE,
P. A. BRINK.