3 Sheets--Sheet 1.

A. CRUMBIE.

Baker's Oven.

No. 125,546. Patented April 9, 1872.

Fig. 2.

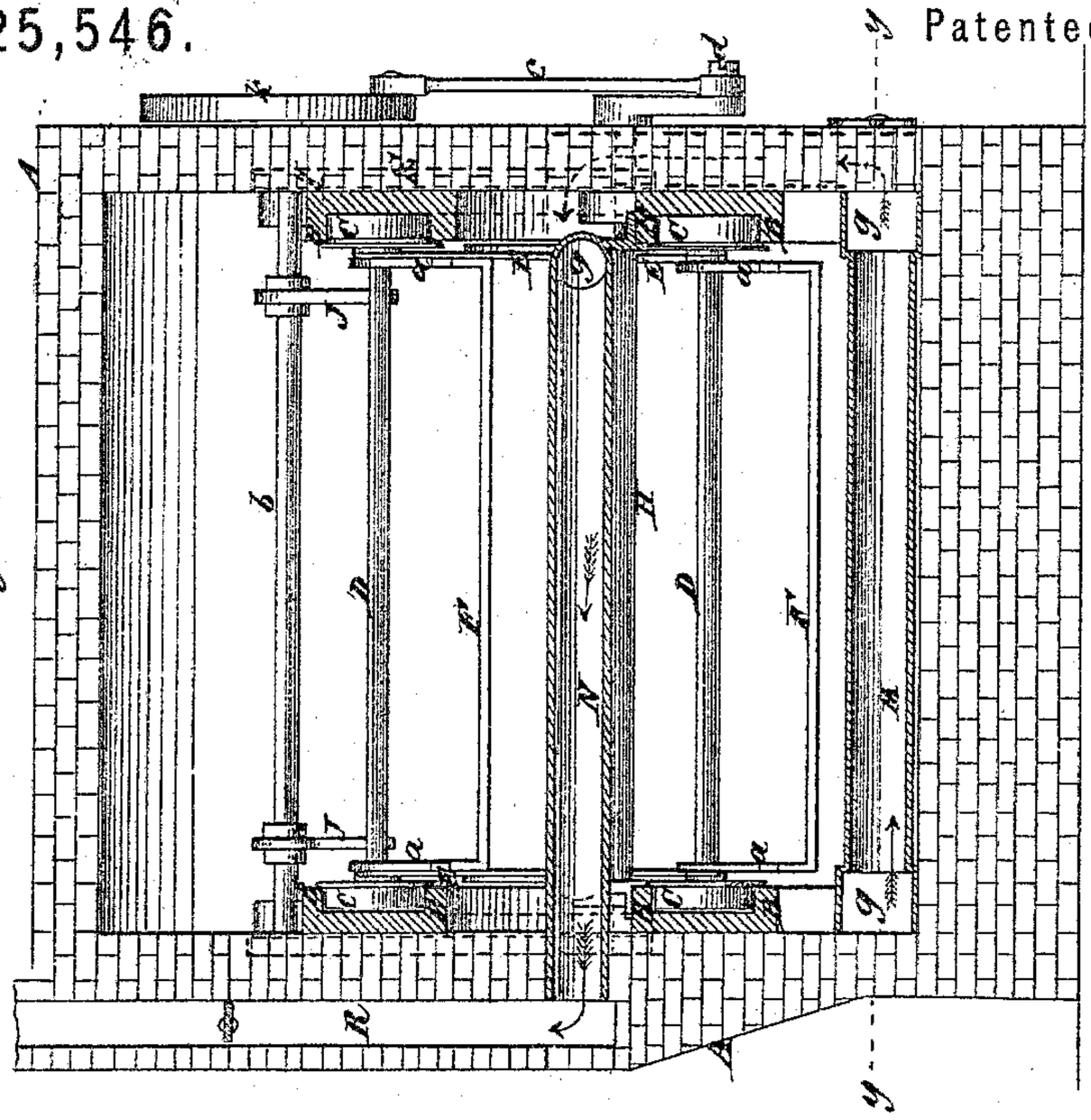
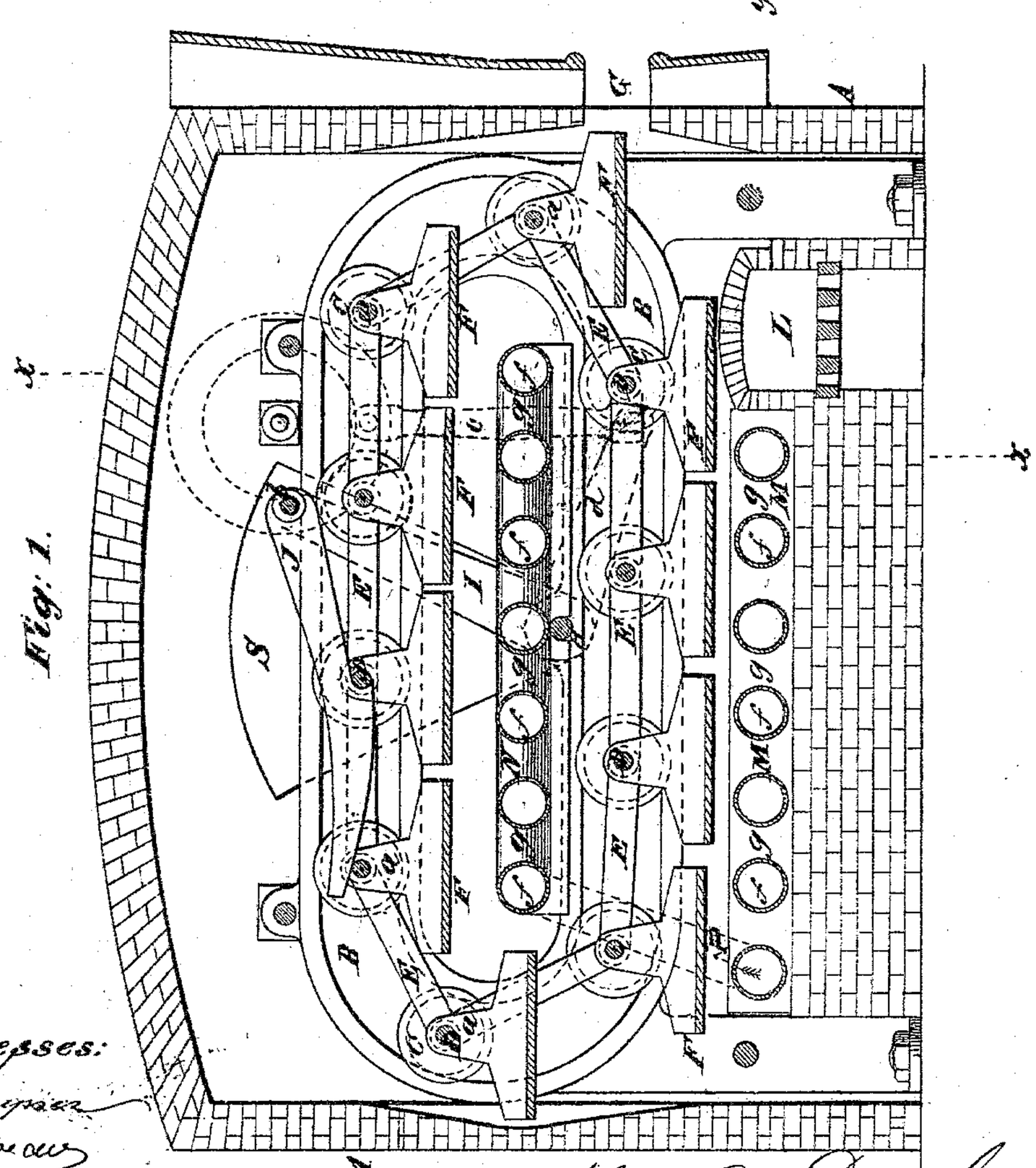


Fig. 1.



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A. CRUMBIE.

Baker's Oven.

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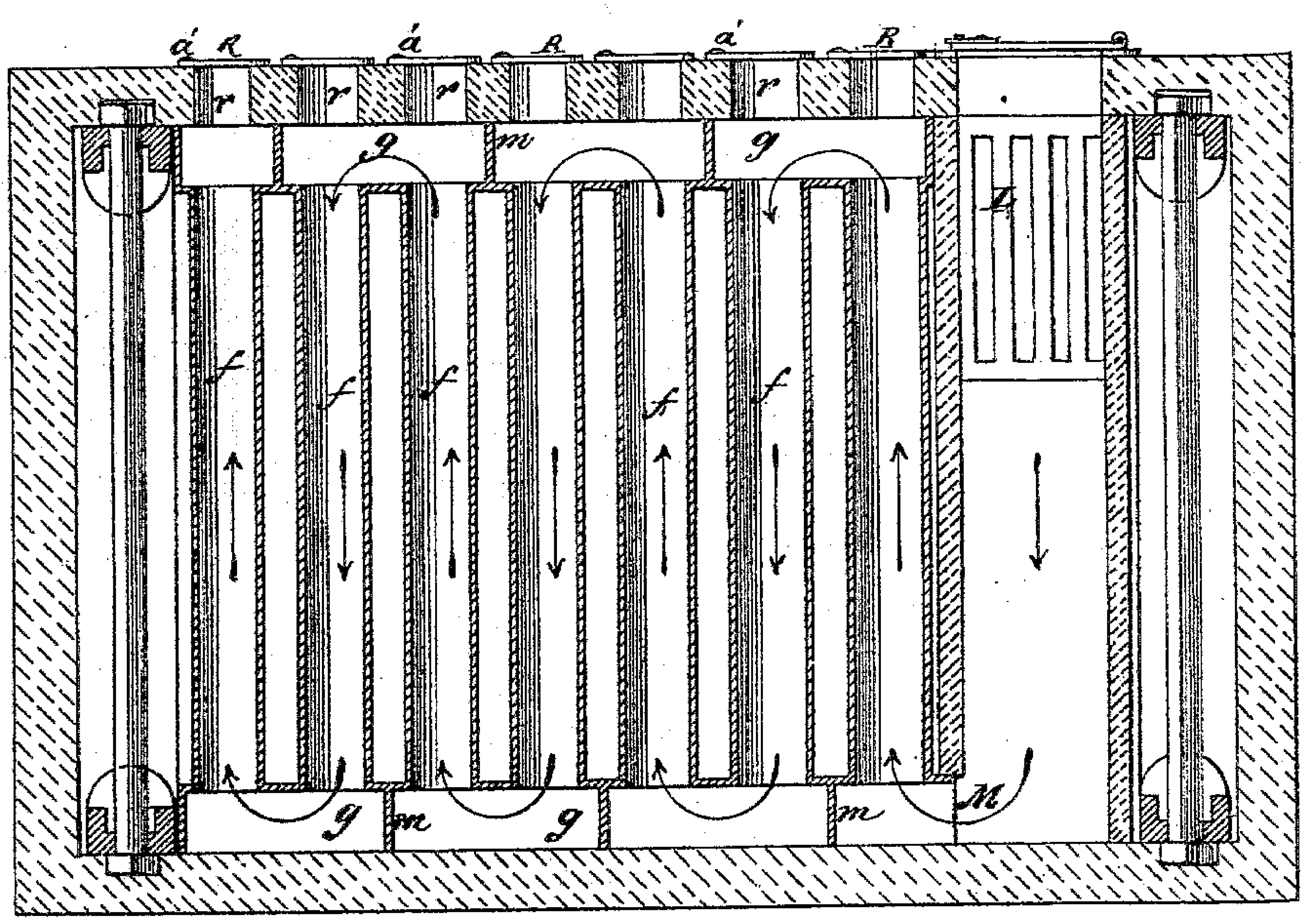
Fig: 3.



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3 Sheets--Sheet 3.

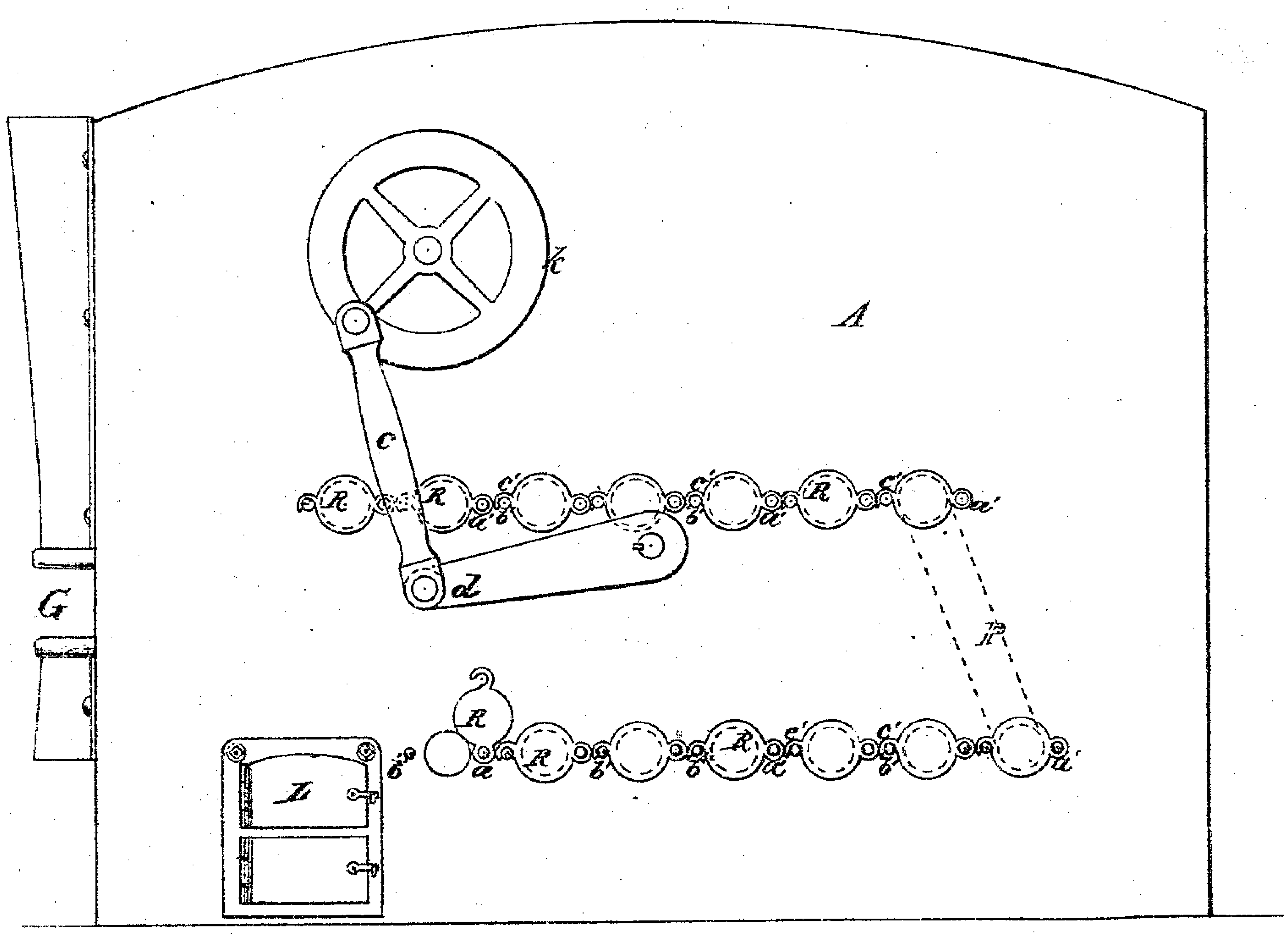
A. CRUMBIE.

Baker's Oven.

No. 125,546.

Patented April 9, 1872.

Fig: 4.



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AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

125,546

UNITED STATES PATENT OFFICE.

ALEXANDER CRUMBIE, OF JERSEY CITY, NEW JERSEY.

IMPROVEMENT IN BAKERS' OVENS.

Specification forming part of Letters Patent No. 125,546, dated April 9, 1872.

To all whom it may concern:

Be it known that I, ALEXANDER CRUMBIE, of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Mechanical Ovens for Bakers' Use; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing making a portion of this specification, in which—

Figure 1 is a vertical longitudinal section of a baker's oven constructed according to my invention. Fig. 2 is a vertical transverse section of the same taken through line *x x* of Fig. 1. Fig. 3 is a horizontal section of the same taken in the line *y y* of Fig. 2. Fig. 4 is a side elevation of the same.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to that class of bakers' ovens in which the loaves, crackers, or other material to be baked, is caused to pass in a circuit through the oven in such manner as to be successively exposed to the heat in all parts thereof, from which it follows that all the loaves or the equivalents thereof are subjected to the same degrees of temperature, and a uniform quality, as far as the baking is concerned, is secured in the whole of the baked product. Its object is to provide an apparatus which shall be more compact in form and convenient in operation than those hitherto in use, as well as capable of affording a more economical and efficient application of the heat of the furnace during the operation of baking. To these ends the invention comprises a system of shelves suspended from traveling-axles held at suitable distances apart by connecting-bars, in combination with traveling rollers and guides, for determining the course of the shelves when made to travel through the oven. Also, a novel arrangement of parts for giving the requisite intermittent movement to the system of shelves when in active use. Also, in a novel arrangement of the heating-flues with reference to certain other parts of the apparatus, whereby an efficient and economical diffusion of heat within the oven is secured. Also, in a novel means of cooling the oven when required, whereby is effectually avoided the temporary rise in temperature incident to an increased inflow of air to the furnace when the doors are opened to cool the oven in the ordinary way.

To enable others to understand the nature of my invention, I will proceed to describe it with reference to the drawing.

The oven may be of brick-work A, of any suitable configuration, and has, at each side, metallic guides or tracks B, straight at top and bottom, but of semicircular form at the ends, and extending nearly or quite the entire length of the oven. In these guides run rollers C, each connected with the one immediately opposite, and in the other guide by a transverse axle, D. These axles are connected by bars E, which keep them at the requisite distance apart, and yet permit the turning of the axles within or through the ends of the bars. Upon each axle is freely suspended a shelf, F, the ends of each shelf being turned at right angles to its length to constitute arms *a*, through holes in which the suspending axle is passed. The system of axles, connected by the bars and journaled axially in the rollers, receive a revolving movement corresponding to the path indicated by the guides in which the rollers run. During such movement the shelves, being freely suspended, of course maintain throughout their movement, and by gravity alone, their horizontal position, as required, for holding whatever may be placed upon them, and are brought, in succession, opposite the opening G in the front of the oven. Extending through the oven from side to side, and through the space between the upper and lower part of the system of traveling mechanism just described, and with its ends working in suitable bearings in the walls of the oven, is a rock-shaft, H. From this rock-shaft extend upward the arms I shown in dotted outline in Fig. 2, and working in recesses S formed in the sides of the oven, connected at their upper extremities by a cross-rod, *b*, which serves as the pivot of two pawls, J, which, during the operations hereinafter presently set forth, catch or act upon the transverse axles D to give an intermittent movement to the same; or, in other words, to bring the shelves in succession, away from and back to the opening G by a traveling but intermittent motion given to the system of which said shelves constitute a part, as herein previously explained. The pawls J are operated by a crank on a ro-

tating disk or wheel, K, connected by a pitman, *c*, with a crank-arm, *d*, on one end of the rock-shaft. The furnace L, of any ordinary or suitable construction, communicates, as represented in Fig. 3, with the forward end of the lower serpentine flue, M, which, at its rear end, is made continuous with the upper serpentine flue N by an upright section or flue, shown in dotted lines at P in Fig. 1, the lower flue M being arranged immediately underneath the lowermost series of shelves suspended from the axle, and the upper flue N being arranged in similar relation with the upper series of shelves in the position naturally assumed by the shelves at any portion of their rotation. The upper flue N connects, as shown in Fig. 2, with the chimney or up-take R. The construction of the two serpentine flues is identical, but that form may be varied when desired. That preferred is shown in Fig. 3, each flue being constructed of straight and transverse sections *f*, joined at their ends into longitudinal sections *g*, divided by partitions *m* to insure the requisite passage of the gaseous products of combustion, in succession, from one of the transverse sections to another.

In the operation of the apparatus the rotation of the wheel K, acting through the devices hereinbefore specified, gives the required intermittent movement to the shelves, bringing them, successively, opposite the opening G. This movement of the shelves is so adjusted that the time occupied by any one shelf in passing downward and back from the opening, and thence upward and forward thereto—in other words, one revolution of the same—will be sufficient for the baking of the dough or material placed thereon. As the shelves are brought opposite the opening the baked loaves or their equivalents are removed during the interval previous to the succeeding intermittent movement, and are replaced by unbaked loaves, or equivalents thereof, so that, in this manner, the baking goes on continuously and each loaf or batch of loaves upon any one of the shelves is made to pass through the same portions of the oven and be subjected to the same variations of heat as all the others.

By this means a uniformity in the baking is insured which would be unattainable under other conditions; at the same time, from the construction and arrangement of the parts, the greatest facility is secured in the operation of the apparatus, and the utmost convenience in attending it while in use. Furthermore, the arrangement of the parts insures compactness and avoidance of any waste of room. The more uniform, efficient, and, consequently, economical diffusion of heat throughout the oven is secured by the arrangement of the upper and lower serpentine flues with reference to the upper and lower portions of the system of suspended shelves.

In one of the side walls of the brick-work shell A of the oven, coincident with the ends of the transverse sections *f*, as shown in Fig. 3, and extending through the outer side of the adjacent longitudinal section *g*, are openings *r;* in other words, these openings communicate directly with the interior of the flues. They are closed at their outer ends by covers R, attached to the wall by pivots *a'*, and furnished with stops *b'*, which, when shut down, as shown more fully in Fig. 4, rest upon studs *c* projecting from the wall. When these covers are closed down over the openings *r* the action of the flues is as previously herein described, and as required during the baking process. But when it is desired to cool the ovens, by simply lifting the covers R cold air is permitted to enter the flues and to circulate through the same, thereby gradually reducing the temperature within the oven without any sudden or preliminary increase, such as necessarily follows when, as is the custom with ordinary ovens for bakers' use, the door of the fire-box is opened to diminish the draught, but which at first produces increased combustion from the sudden inlet of a large quantity of air.

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

1. The shelves F suspended from the axles D connected by the bars E, in combination with the rollers C, traveling in the guides B, substantially as and for the purpose specified.

2. The arrangement of the rock-shaft H, furnished with the arms I and crank-arm *d*, and operated by the pitman *c* of the wheel K, with reference to the pawls J and the axles D of the traveling system of suspended shelves F, substantially as and for the purpose specified.

3. The serpentine flues M N, connected with each other by the flue-section P, and arranged in relation with the upper and lower portions of the system of traveling shelves F, the furnace L, and the up-take R, substantially as and for the purpose specified.

4. The arrangement of the openings *r* and covers R in relation to each other and the serpentine flues M N, substantially as and for the purpose specified.

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