

(No Model.)

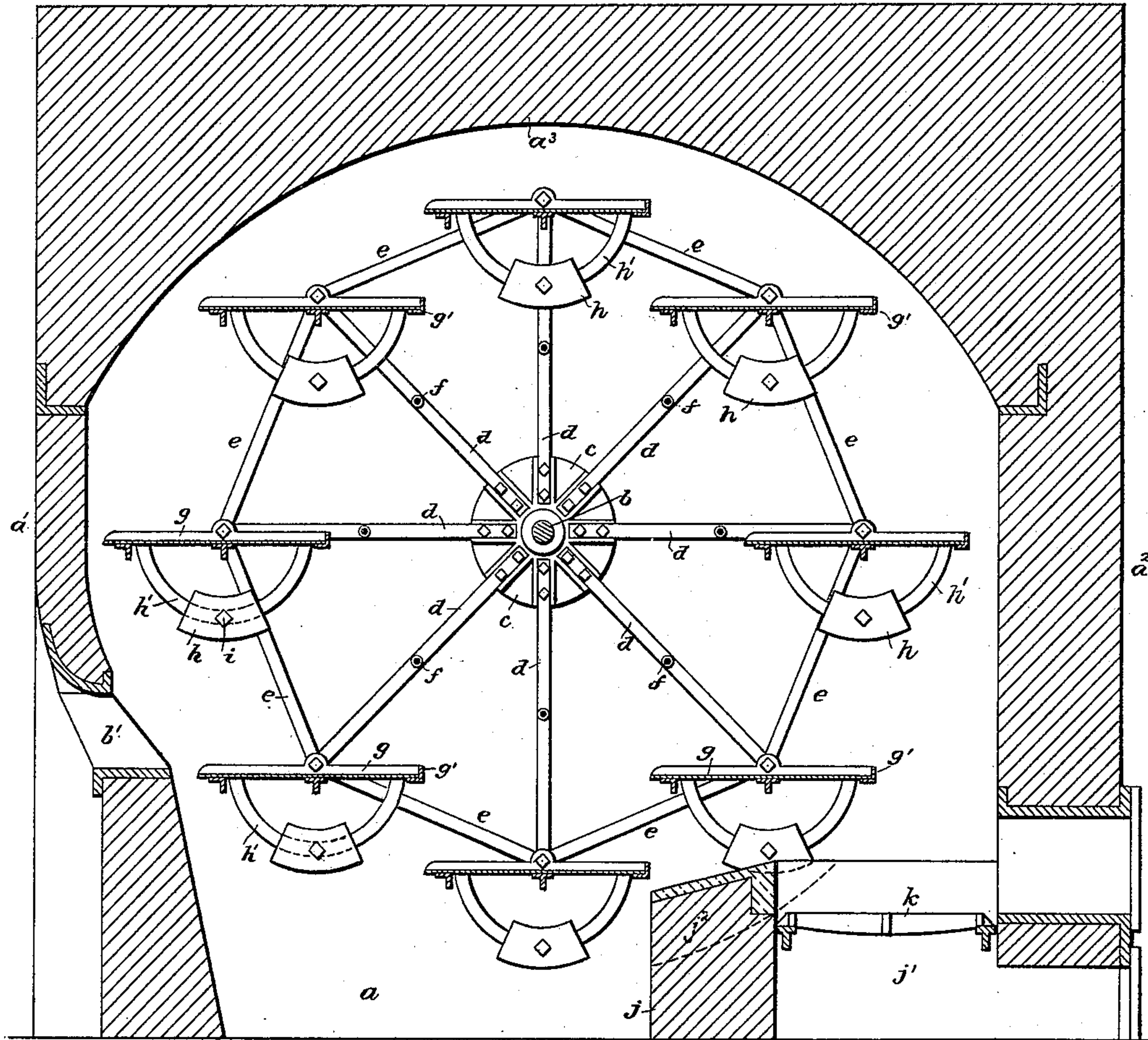
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A. CRUMBIE.
BAKING OVEN.

No. 405,304.

Patented June 18, 1889.

Fig. 1.



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2,

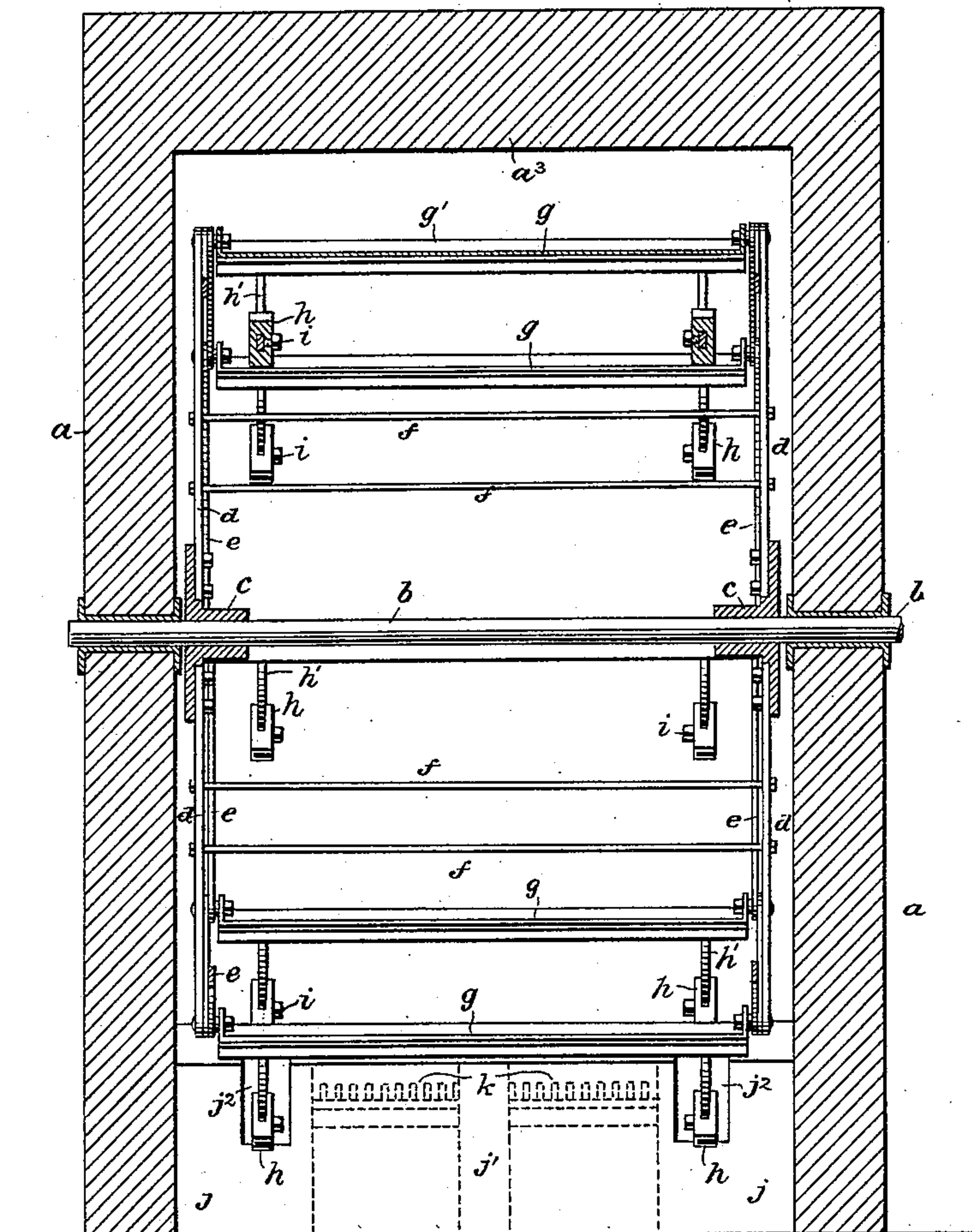
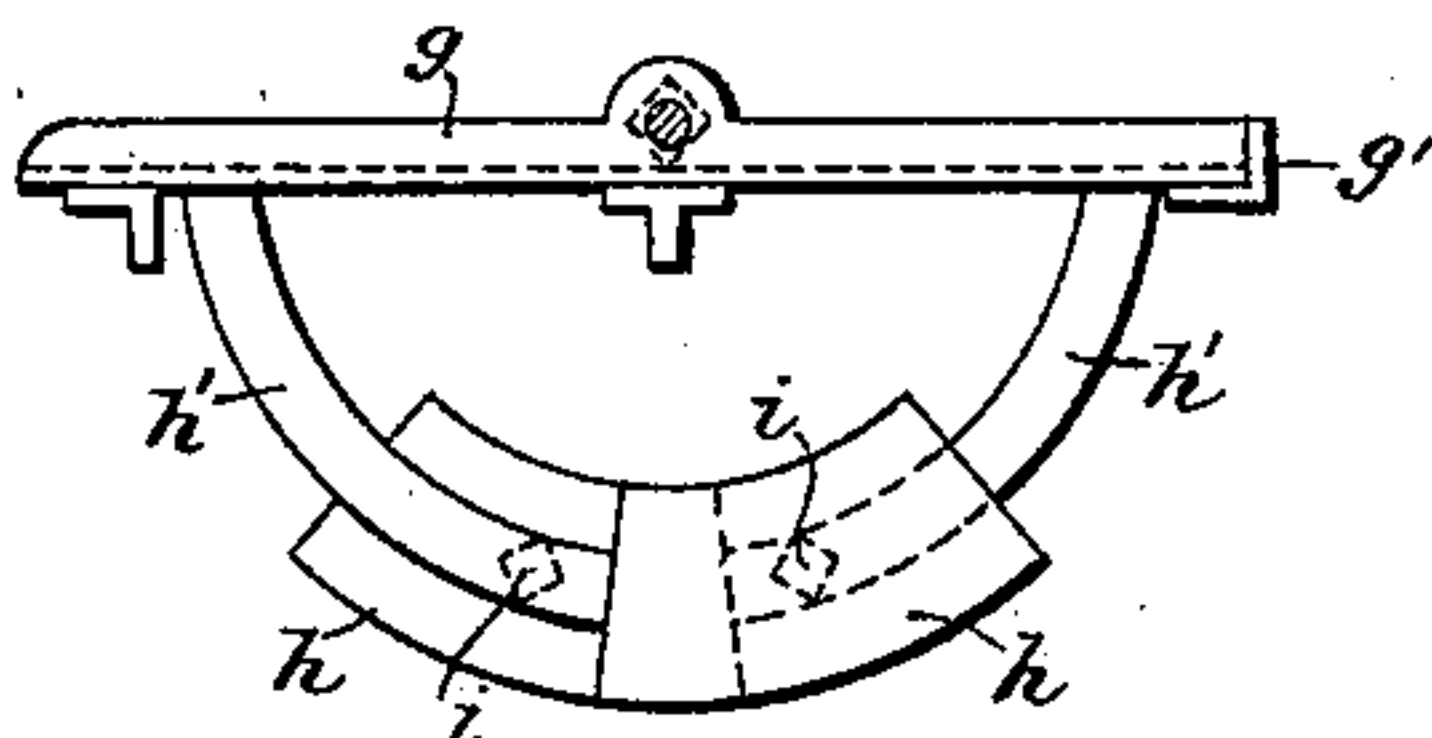


Fig. 3.



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UNITED STATES PATENT OFFICE.

ALEXANDER CRUMBIE, OF ARLINGTON, NEW JERSEY.

BAKING-OVEN.

SPECIFICATION forming part of Letters Patent No. 405,304, dated June 18, 1889.

Application filed January 29, 1889. Serial No. 297,930. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER CRUMBIE, a citizen of the United States, residing at Arlington, county of Hudson, State of New Jersey, have invented certain new and useful Improvements in Baking-Ovens, of which the following is a specification, reference being had to the accompanying drawings, which form part hereof.

10 This invention relates to that class of baking-ovens denominated "reel ovens," in which a reel mounted in bearings and having suspended therefrom a series of pans for holding the crackers, biscuit, or other material to be
15 baked, is caused to slowly revolve within a heated chamber; and the invention embodies various improvements in the construction of such devices, whereby they are made more simple and compact, and their efficiency is
20 greatly increased.

In the accompanying drawings, to which I will now refer, Figure 1 is a longitudinal vertical section of my improved reel oven, and Fig. 2 is a transverse vertical section of the
25 same. Fig. 3 is a detached elevation of one of the baking-pans.

The body of the oven consists of the side walls a , the end walls a' , and the arched roof a'' , inclosing the chamber containing the
30 reel and furnace. The left-hand end or front wall a' is inclined inward at its lower part, and is provided with the charging and discharging opening or mouth b , and the right-hand end or rear wall a'' is provided with
35 openings for affording access to the fires and ash-pit, as shown. The mouth b is placed but a small distance above the furnace-openings in the opposite wall and in the inwardly-inclined portion of the wall, and thus the inner
40 end of the mouth b is brought close to the baking-pans. The inward inclination of the lower portion of this front wall a' permits forming a recess therein at the mouth b .

The reel consists of a frame mounted on a
45 shaft. This shaft c has bearings in the side walls a of the furnace, and motion is imparted to it by a belt and pulleys or any suitable device usual in this class of furnaces. Two disks c' are secured to the shaft c —one
50 at each end—in juxtaposition to the bearings, and these disks are provided with grooves, in which are bolted the radial supporting-arms

d . The radial arms d of each set are joined together at their outer ends by the struts e , and the corresponding radial arms
55 of the two sets are connected by the tie-rods f , thus forming a light and strong frame or reel.

The baking-pans g are pivoted to the reel at the outer ends of the radial arms d on the
60 bolts which join the radial arms to the struts e by means of lugs on the ends of the pans fitting over these bolts. These baking-pans g are composed of flat plates of sheet metal, having flanges at their ends, from which the
65 suspending-lugs project, and bracing-bars of angle and T iron are secured longitudinally to the pans. One of these angle-irons in each pan is so placed that it forms a back flange
70 g' for the pan. The pans are swung just below their point of suspension, and as in this position their equilibrium would not be sufficiently stable for practical purposes counter-weights are placed below the pans. These
75 counter-weights h are held on the curved arms h' , preferably shaped to an arc of a circle, each arm being secured at both of its ends to the pan, and two arms h' , with counter-weights
80 h , are secured to each pan g , one at each end of the pan.

The counter-weights are fitted to move freely on the arms h' , and can be clamped in any desired positions thereon by means of the set-screws i . It will be observed that the
85 greatest radius of a pan and attached parts, taking the suspension-point as a center, but little exceeds half the width of a pan.

The furnace is placed at the back of the oven. It is of ordinary construction, being inclosed at the sides by masonry walls j . A
90 central partition-wall j' divides it into two compartments, each having a set of grate-bars k and suitable stoking and ash-pit openings. The products of combustion pass directly into the chamber and escape through openings in
95 the roof, as ordinarily. To permit the pans to approach close to the fire, grooves j'' may be provided in the furnace-walls j for the passage of the counter-weights h and arms h' , as shown.

Heretofore in ovens of this class the dimensions of a reel large enough to accommo-
date a sufficient number of pans and allow them to swing clear of each other in all posi-

tions have been such as to make the oven an inconveniently-large structure, occupying in height two floors of a building. In my construction, as above set forth, the pans and
 5 attached counter-weights are included within a radius not larger than that resulting from the actual dimensions of the pans. This enables the pans to be placed much closer together than in any other construction heretofore used, and thus permits the use of a reel
 10 of smaller circumference without reducing the number or dimensions of the pans. The reduction in the size of the reel permits a corresponding reduction in the dimensions of the inclosing-chamber, and thus a considerable
 15 saving of space is had—so much that the device can be fitted up in and occupy but one floor of a building. There is also a large saving in the materials of construction and in the fuel consumed resulting from this reduction
 20 in the dimensions of the reel and chamber. It has heretofore been necessary to place the mouth for the insertion and removal of the material to be baked in the upper part of the oven and on the floor above that at which the
 25 lower part of the oven and the furnace-openings therein have been located, and the furnace-openings have heretofore been made in the front wall. In my construction this
 30 mouth *b* is placed but little higher than the furnace-openings and the furnace is placed at the back of the oven, so that the mouth and the furnace-openings can be used from the same horizontal level or floor, and the recess
 35 formed in the oven-walls at this mouth effects considerable economy in working-space. Another advantage resulting from placing the mouth *b* in the lower part of the furnace is, that the heated gases and vapors that fill the
 40 chamber, resulting from the combustion of the furnace and the evaporation of the moisture in the dough, do not to any appreciable extent escape through this mouth. The mouth *b* and the furnace-openings in my construction are placed in opposite walls of the
 45 oven, and the pans *g*, therefore, always have the back flange *g'* toward the fire. This back flange *g'* protects the material on the pans from the direct radiation of the fire, and thus
 50 permits the pans to approach closely thereto without danger of burning or scorching the material to be baked.

It is evident that placing the furnace close to the pans on the reel also permits a considerable reduction in the height of the oven.
 55 The counter-weights *h*, being placed one at each end of a pan, do not interfere with this feature, as grooves *j*² are cut in the furnace-walls to afford them clearance.

60 The use of two independent adjustable weights *h* for each pan *g*—one at each end of the pan—and the fact that each arm *h'* is secured at both ends to the pan, afford a simple and efficient means for correcting any
 65 warping or twisting of the pans without affecting their equilibrium. Whenever any tendency to warping appears in a pan, the

weight at this end of the pan can be pushed up on the curved arm *h'* to a position in which it will exert a sufficient downward pull
 70 to restore the pan to proper shape, and then the weight on the other end of the same pan can be pushed up on its curved arm a like distance in the opposite direction, so as to exactly counterbalance all tendency to tip
 75 the pan. Fig. 3 shows a pan *g* with the counter-weights *h* adjusted in this manner, and the location of a counter-weight at each end of a pan tends to prevent any warping of the pans, while the adjustability of these
 80 weights permits the pans to be nicely balanced.

I do not herein claim, broadly, a counter-weight suspended below the pan of a reel oven, as such device is shown in Letters Patent No. 158,916, granted to myself and D.
 85 Donald on January 19, 1875.

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

1. A baking-pan for reel ovens provided
 90 with arms depending therefrom at each end of the pan, both ends of each arm being secured to the pan, and counter-weights adjustably secured to the arms, substantially as shown and described.

2. A baking-pan for reel ovens provided
 95 with the curved arms *h'*, depending therefrom at each end of the pan, both ends of each arm being secured to the pan, and counter-weights *h*, adapted to be moved along
 100 the arms and adjustably secured to the arms, substantially as shown and described.

3. In a baking-oven, in combination, a revolving reel, the pans *g*, suspended from the reel, each pan being arranged close to its
 105 point of suspension, and the adjustable counter-weights *h* on curved arms *h'*, secured at each end to and depending from the pans *g*, substantially as shown and described.

4. In a baking-oven, in combination, the
 110 oven-walls, the front wall being inclined inward at its lower part, the mouth *b'* in the inclined lower part thereof, the revolving reel pivoted in the oven-walls, the pans *g*, suspended from the reel, each pan being arranged
 115 close to its point of suspension, and the adjustable counter-weights *h* on curved arms *h'*, secured to and depending from the pans *g*, substantially as shown and described.

5. In a baking-oven, in combination, the
 120 oven-walls, the front wall being inclined inward at its lower part, the mouth *b'* in the inclined lower part thereof, the revolving reel pivoted in the side walls, the pans *g*, suspended from the reel, each pan being arranged
 125 close to its point of suspension, the adjustable counter-weights *h* on curved arms depending from the pans, and the furnace *j* *h*, located at the back of the oven, substantially as shown and described.

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Witnesses:

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 EDWIN SEGER.