No. 885,702. PATENTED APR. 21, 1908.

S. STEWART.

PORTABLE REVOLVING BAKER'S GAS OVEN.

APPLICATION FILED JAN. 17, 1907.

4 SHEETS—SHEET 1.

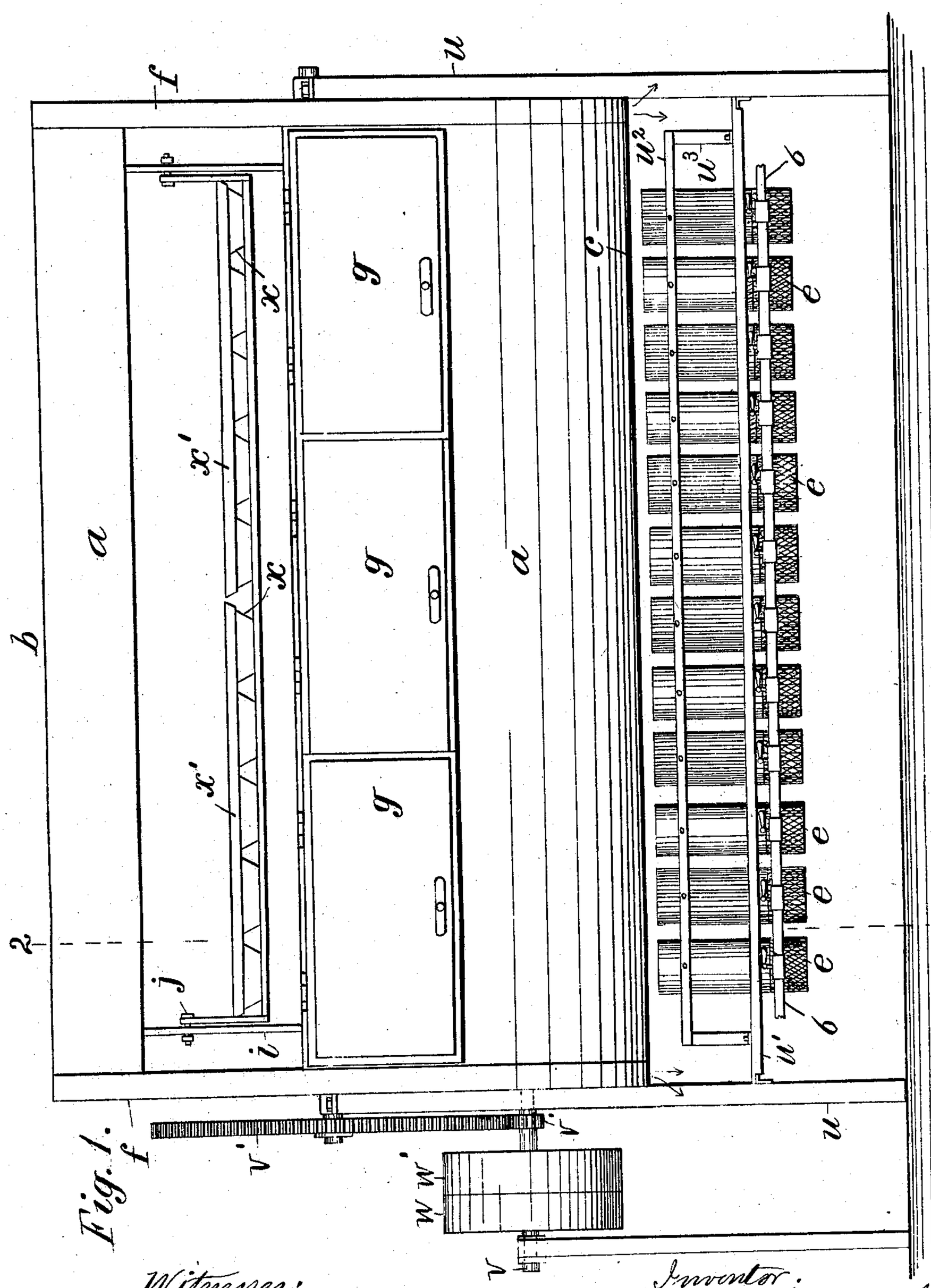

Fig. 1.

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J. Walter Greenbaum

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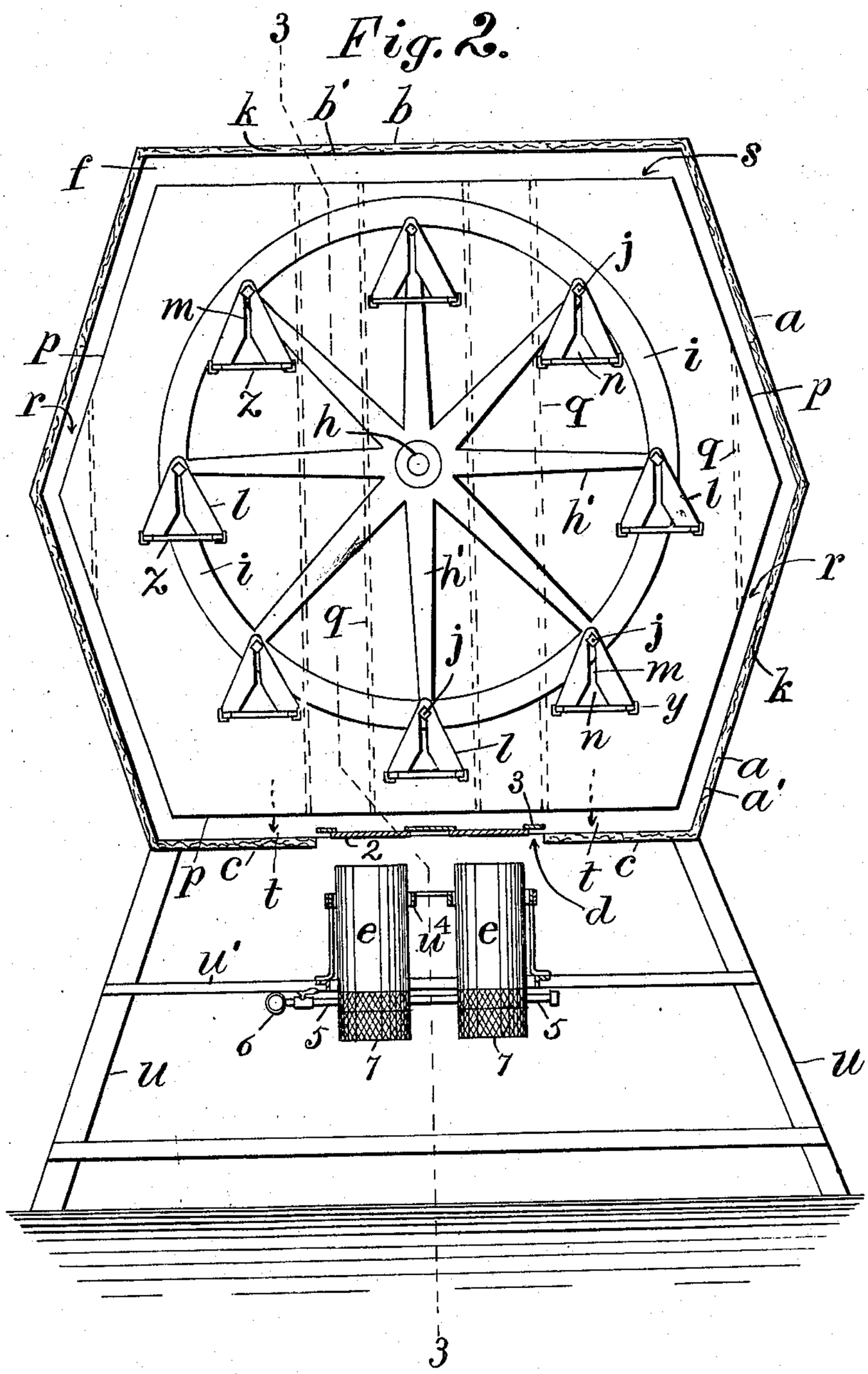
4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

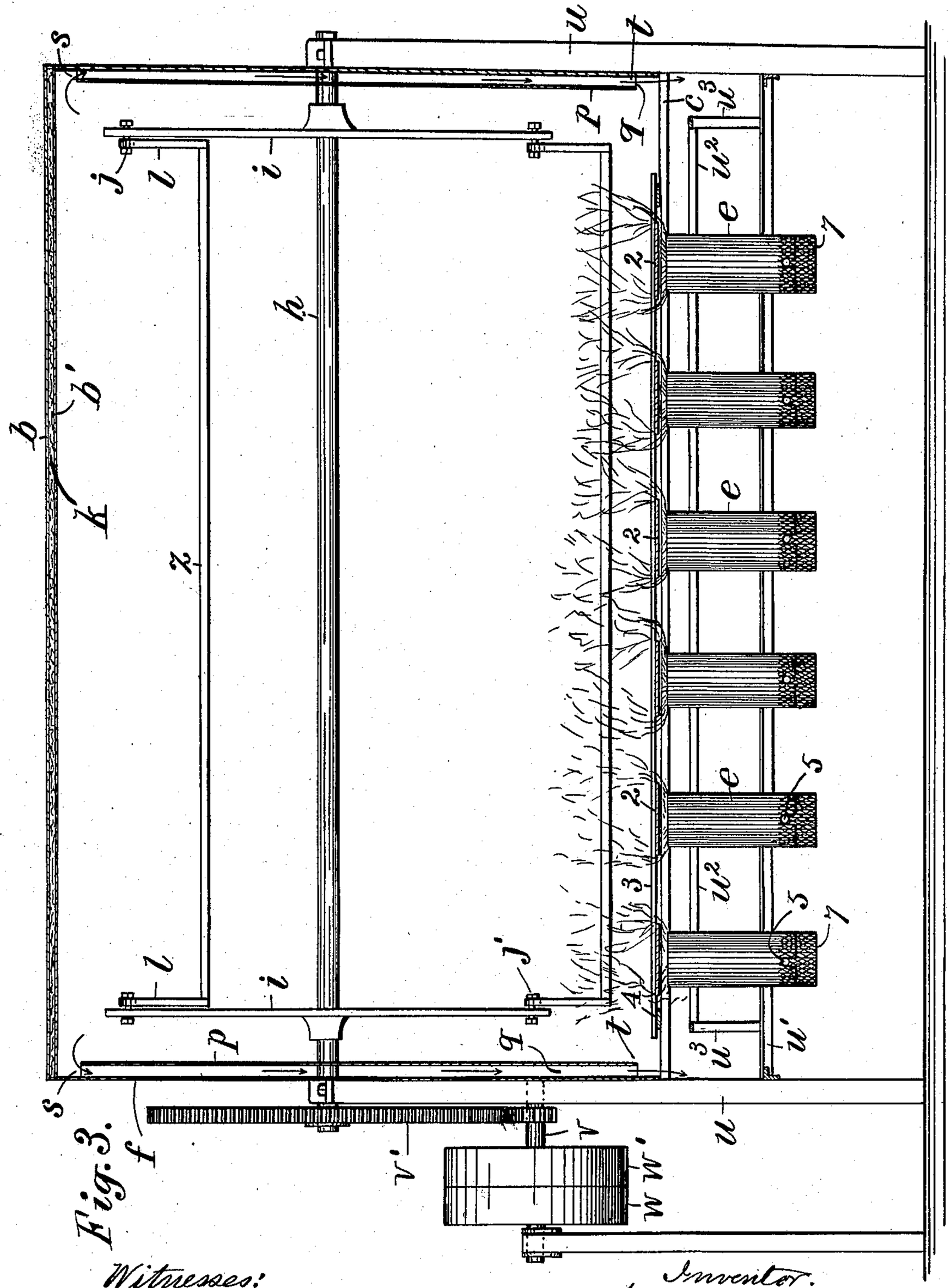

Fig. 3.

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4 SHEETS—SHEET 4.

Fig. 4.

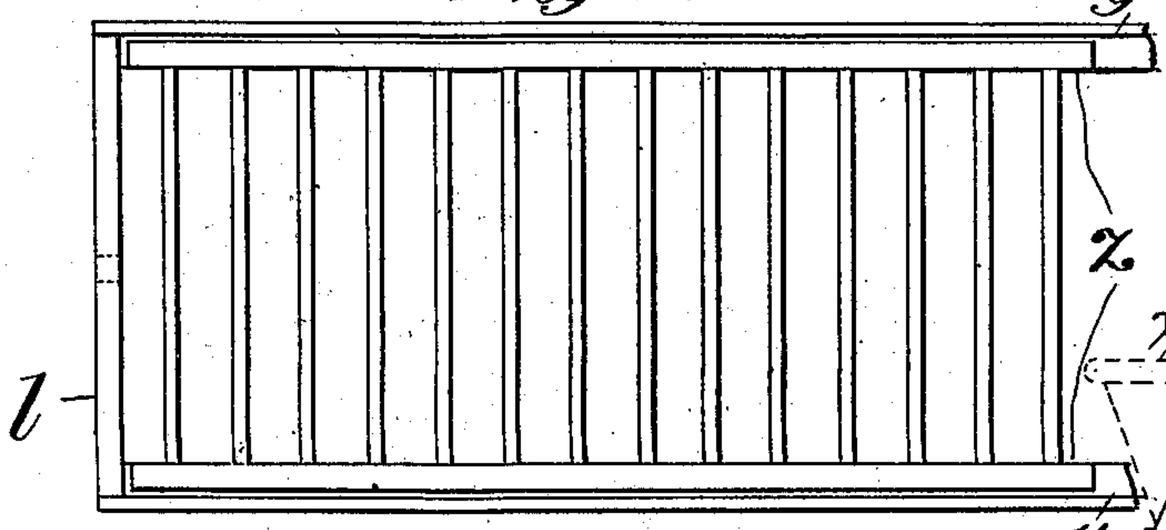


Fig. 7.

Fig. 5.

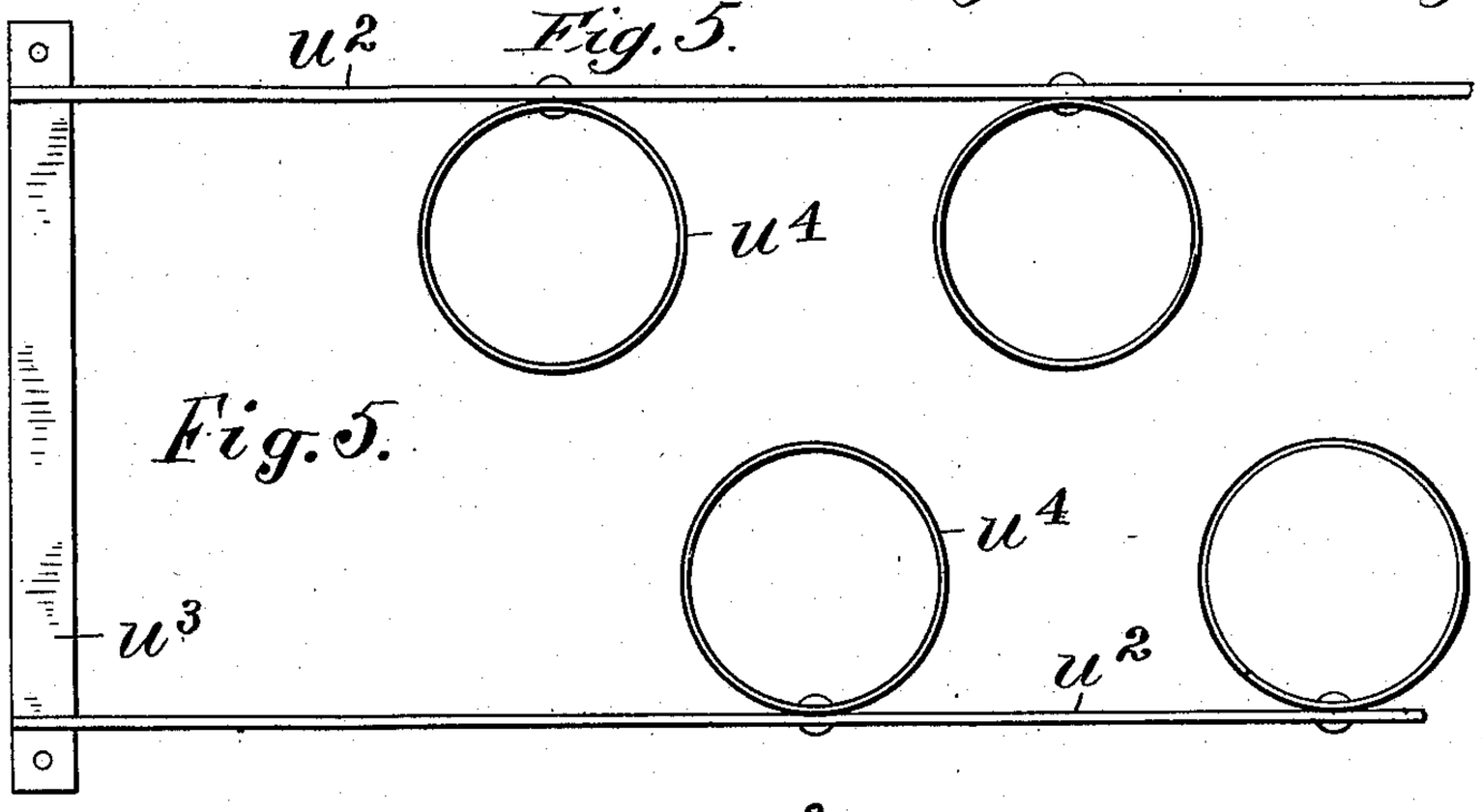
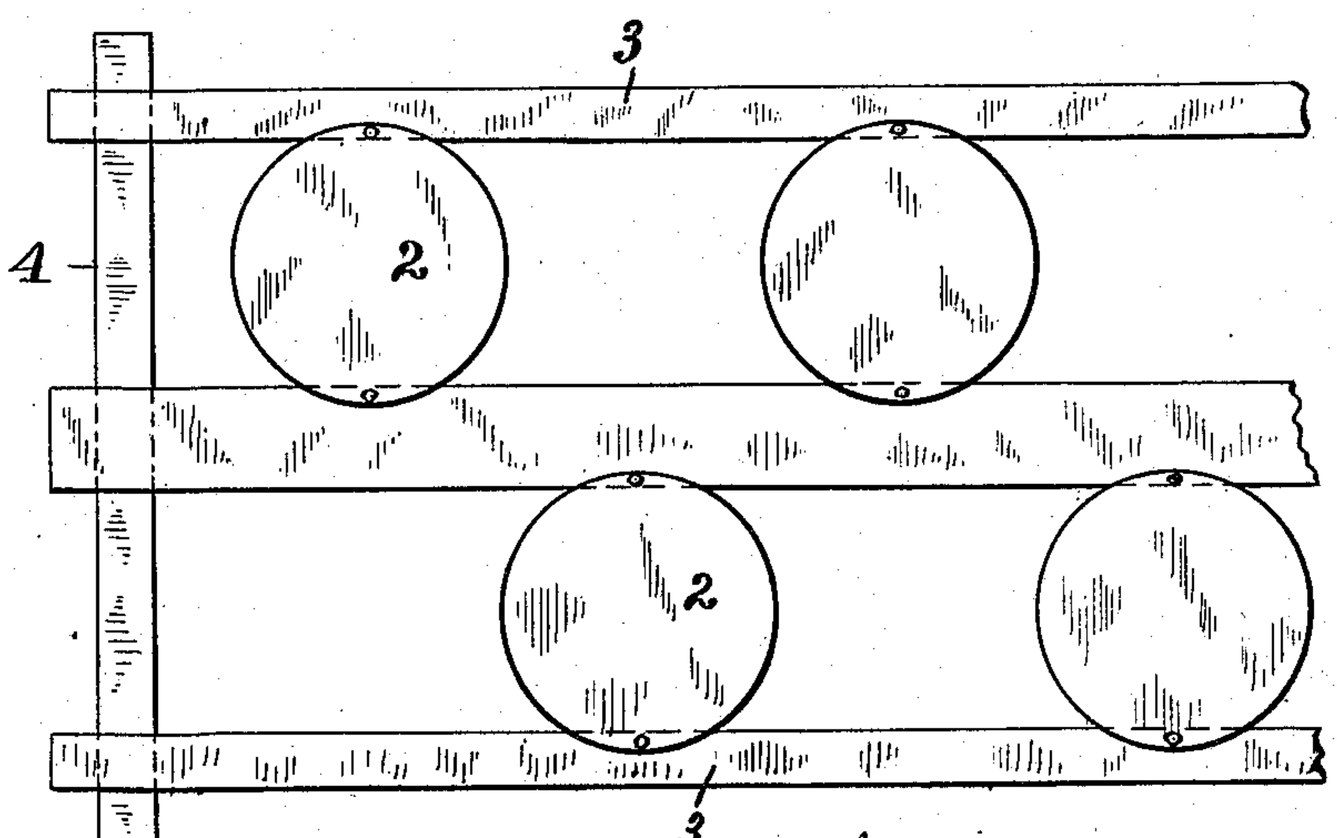


Fig. 6.



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UNITED STATES PATENT OFFICE.

SAMUEL STEWART, OF NEWARK, NEW JERSEY.

PORTABLE REVOLVING BAKER'S GAS-OVEN.

No. 885,702. Specification of Letters Patent. Patented April 21, 1908.

Application filed January 17, 1907. Serial No. 352,673.

To all whom it may concern:

Be it known that I, SAMUEL STEWART, a citizen of the United States, residing at 151 Sherman avenue, Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Portable Revolving Bakers' Gas-Ovens, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of this invention is to furnish a revolving gas oven for bakers' use which can be manufactured, shipped and set up for use without brickwork, foundation, or any attachment except the application of power to rotate the reel. To accomplish these objects, gas is used as fuel, and the oven embraces a casing with a longitudinal opening in the extreme bottom part, a series of burners disposed beneath such opening, a door for access to the shelves, and ventilating passages formed adjacent to the end heads of the casing.

The invention will be understood by reference to the annexed drawing, in which

Figure 1 is a front view of the entire device with the door open; Fig. 2 is a cross section on line 2, 2, in Fig. 1; and Fig. 3 is a vertical section on line 3, 3, in Fig. 2. Fig. 4 shows part of one shelf in plan; and Fig. 5 part of the auxiliary burner-frame. Fig. 6 is a plan of part of one of the baffle-plate frames. Fig. 7 is an elevation of a shelf-hanger with cross section of the angle-bars which connect such hangers.

The casing is shown with sides *a*, with top *b* and with bottom *c* having a central longitudinal opening *d* beneath which two rows of burners *e* are shown, but not extended quite to the ends or heads *f* of the casing. One of the sides *a* has a door *g* in its upper part extending the whole length, for access to the reel. A reel-shaft *h* is extended through the heads and carries reel-heads *i* within the heads, having headed pivot-studs *j* projected from their adjacent faces, with the shelves *z* hung thereon by slotted shelf-hangers *l*. The shelf-hangers are formed with openings *n* below the slots *m*, by which they are introduced over the heads of the pivots, the weight of the shelves then holding the slots in engagement with the pivots.

The reel-heads *i* are shown of spider form with arms *h'*, but may be made of solid plates or with arms alone, as any structure is equivalent which carries the pivots as shown.

The sides and top of the casing are formed of two sheets of metal *a*, *a'*, and *b*, *b'*, with a layer *k* of any non-radiating and incombustible material like asbestos or magnesia between the same; but the heads *f* are not protected from radiation of heat, as each of them is intended to be cooled so that it can be used as part of a downward flue which is intended for the escape of the gases, which gases are chilled and more or less condensed as they rise within the casing from the burners, in contact with the damp bread during the operation of baking. Such flues are formed by the use of flue-plates *p* somewhat smaller than the heads, and secured thereto with intermediate ribs *q* which space them from the heads sufficiently for the downward passage of the gases.

The flue-plates are proportioned to leave inlets *r* and *s* at the edges and top, and an outlet *t* at the bottom of the heads. The gases enter at the inlets when chilled and condensed, because the heads not being protected from radiation are materially colder than the interior of the casing. The rows of burners are not extended to the ends of the opening *d*, to avoid any upward current of gas at the ends, and thus permit the escape of the chilled gases as they pass from the flue-outlet through the ends of the opening *d*.

Iron leg-frames *u* are shown attached to the heads to rest upon the floor, and support the burners by means of frame-bars *u'*. The leg-frames also furnish a bearing for a motor-shaft *v* which is shown connected with the reel-shaft *h* by gears *v'*. The motor-shaft is shown provided with fast and loose driving-pulleys *w*, *w'*, but it is obvious that an electric motor or any other agency may be used to rotate the motor-shaft.

Fig. 1 shows the door open and pans *x* set upon the shelf in front of the door, thus illustrating the facility for loading and unloading the reel.

Eight shelves are shown hung upon the reel, and the length of such shelves may be varied to suit the requirements, so as to make the oven of any desired capacity.

The waste gases are discharged through the downward flues next the heads *f*, and are thus retained in the oven until they are chilled sufficiently to pass downward, whereby great economy of operation is secured, so that in practical operation eighty 2 lb. loaves of bread can be baked in fifty minutes with only 100 feet of gas.

The whole structure is exceedingly light in weight, and is thus readily transported, and may be erected upon any floor of a building, and instead of absorbing and radiating an enormous amount of heat like the casing heated with a coal furnace, it is supplied with no excess of heat, and retains the gases until they are chilled to a very great extent, and it therefore radiates but a very little proportion of the heat which is furnished.

The burners are shown of the tubular form represented in my prior patent No. 407,134 dated July 16, 1889, which burners are very cheap in construction because made wholly of sheet metal and wire cloth, and as separate burners are used with a separate cock to supply each with gas, the heat can be perfectly regulated and proportioned to the quantity and rate of baking to be done.

It has been found advantageous to form the shelves with numerous perforations to permit the direct contact of the rising hot gases with the bottoms of the pans. This is readily effected by connecting the shelf-hangers *l* by angle tie-bars *y* with their horizontal flanges disposed toward one another, and supporting upon such flanges the ends of gratings *z*, made in sections, as shown in Fig. 4, so as to fill the space between the heads.

Fig. 4 shows the grating *z* lying loosely upon the bottom flanges of the angle-bars *y*, and Fig. 7 shows the side flanges of the bars projecting slightly above the tops of the gratings to form stops for the ends of the baking pan. The flanges of the tie-bars thus perform the double function of supporting the gratings detachably, and of holding the pans in place upon the shelves during their movement. This function of the flanges is indicated by the dotted lines *x* in Fig. 7, representing the same pans which are shown in Fig. 1 secured together by straps *x'* in groups or bunches of five to facilitate their removal from the shelves.

It is found in practice that this construction of oven is quite portable, and is so light in weight that it may be placed upon any floor of a building where there is plenty of light, air and sunshine, and coolness compared with the temperature of the cellars in which brick baking ovens are commonly erected. Such lightness of weight in a reel oven is secured partly by the use of gas, which dispenses with a coal furnace, and partly, by the use of a metallic casing having a non-heat-conducting jacket, and secures far more cleanliness and healthfulness in the bread which is baked, by permitting the oven to be erected in a light place where it can be properly inspected and properly cleaned.

The special arrangement of the auxiliary burner-frame shown in Fig. 5, consists of the auxiliary frame-bars u^2 sustained by standards u^3 upon the frames *u*, and each having rings u^4 attached thereto to loosely support the upper ends of the burners so that the burners may be readily removed at pleasure.

Baffle-plates 2 are shown in Figs. 3 and 6, supported over the burners, in the opening *d* in the bottom of the oven, by frame-bars 3 to which they are secured and which are supported at intervals upon the bottom by cross-bars 4. Such construction makes a unit of all the baffle-plates and holds them detachably in place so that they may be lifted or removed at any time for access to the tops of the burners.

The bodies of the burners which in practice are made with the usual wire gauze at the top, are made detachable by support upon transverse branches 5 of the gas supply-pipe 6, the body of each burner being notched at the bottom as shown in Fig. 3, to straddle the branch-pipe 5, and the bottom of the burner being supplied with air by a perforated cup 7 suspended upon the branch-pipe.

The bodies of the burners being held loosely upon the branch-pipes and loosely in the rings u^4 are thus readily removable.

Having thus set forth the nature of the invention what is claimed herein is:

1. The combination, with the casing containing the baking chamber provided with a longitudinal opening in the bottom, of a series of burners situated beneath said chamber and communicating with said opening, means for independently regulating said burners, baffle-plates situated above said burners, and a removable support for said baffle-plates.

2. The combination, with the casing containing a baking chamber provided with a longitudinal opening in the bottom, of a series of burners situated beneath said chamber and communicating with said opening, means for independently regulating said burners, baffle-plates situated above said burners, wheels rotated within the casing adjacent to the heads with pivots thereon and shelf-hangers suspended from the pivots, angle tie-bars connecting the opposite edges of the shelf-hangers, and gratings supported detachably upon the angle-bars to form the shelves, with the vertical flanges of the angle-bars projected above the grating, whereby such flanges perform the double function of holding the gratings detachably upon the bars and of maintaining the baking pans in place when set upon the gratings.

3. A portable revolving baker's gas-oven, comprising a sheet-metal casing having sides and heads with a shaft extended through the heads, wheels secured to the shaft near the heads of the casing with pivots thereon and shelves suspended from the pivots, a door in the side of the casing, a longitudinal opening in the bottom of the casing, a series of gas burners discharging their heated gases into the casing, and flue-plates attached to the heads of the casing forming a downward flue with inlet at the top of each flue for the en-

trance of the condensed gases, and outlet at the bottom for discharging such gases.

4. A portable revolving baker's gas-oven, comprising a sheet-metal casing having sides and heads with a shaft extended through the heads, wheels secured to the shaft near the heads of the casing with pivots thereon and shelves suspended from the pivots, a door in the side of the casing, a longitudinal opening in the floor of the casing, a row of gas burners discharging their heated gases into the opening excepting near the ends, and flue-plates attached to the heads of the casing forming a downward flue with inlet at the top and sides for the entrance of the condensed gases, and outlet at the bottom for discharging such gases through the ends of the opening in the floor of the casing.

5. A portable revolving baker's gas-oven, comprising a casing having the sides formed of double walls of sheet-metal with an intervening layer of incombustible and non-heat conducting material to resist radiation of heat, and heads formed of metal only to permit radiation of heat, a reel having suspended shelves rotated within the casing, a door in the side of the casing for access to the shelves, gas burners discharging their heated gases into the casing, and outlet flues for the condensed gases contiguous to the metallic heads.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

SAMUEL STEWART.

Witnesses:
L. LEE,
THOMAS S. CRANE.