

G. F. HUMPHREY.
BAKER'S OVEN AND THE LIKE.
APPLICATION FILED JAN. 2, 1913.

1,060,841.

Patented May 6, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

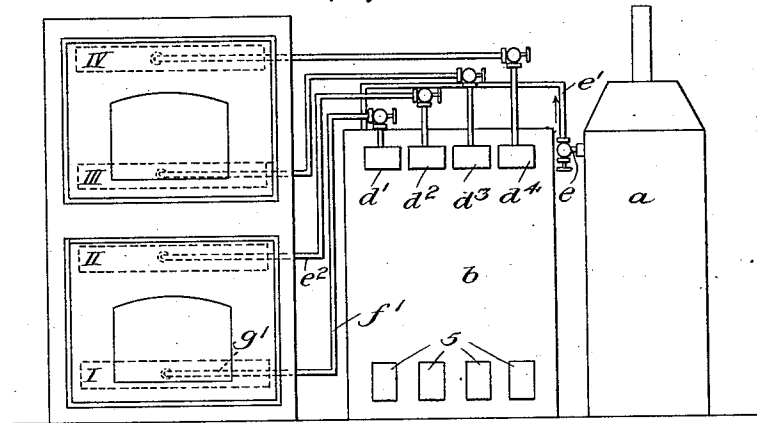
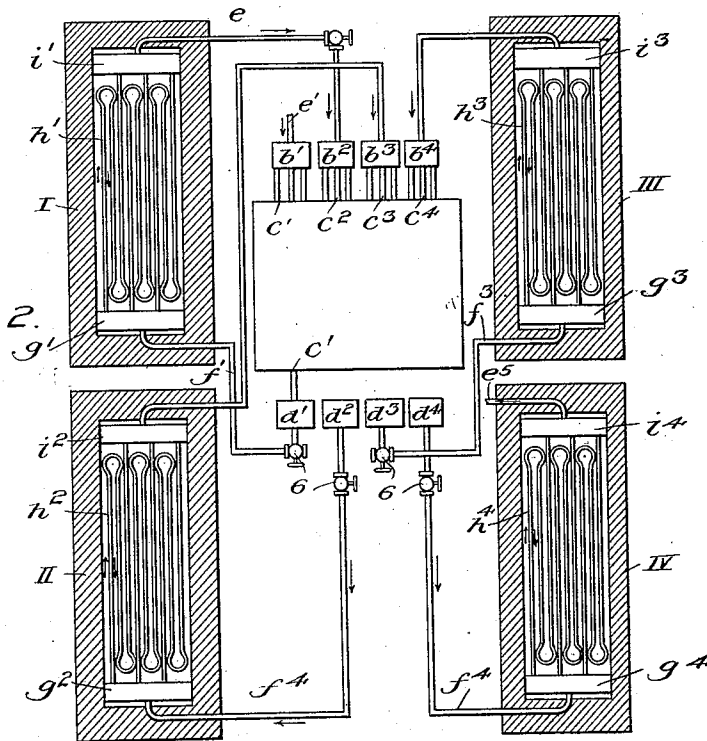


Fig. 2.



WITNESSES:

S. M. Brown
Robert Craig Greene

INVENTOR

George Frederick Humphrey
BY Wallace Greene,

Attorney

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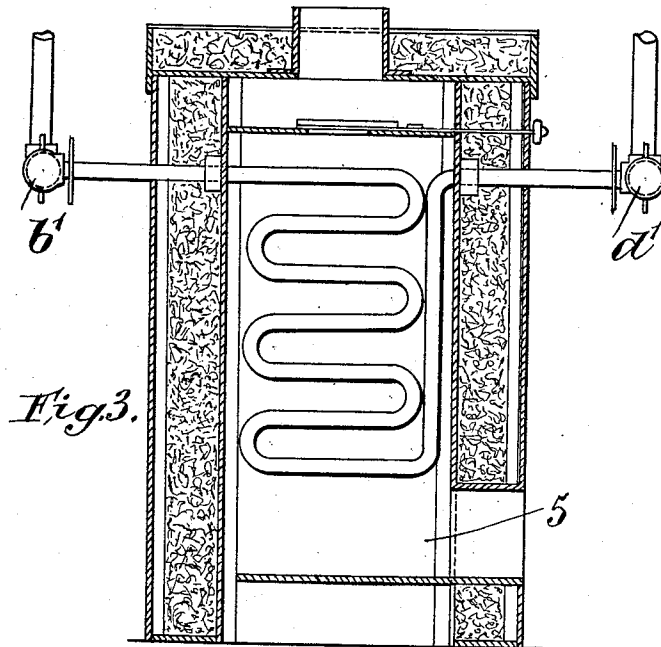


Fig. 3.

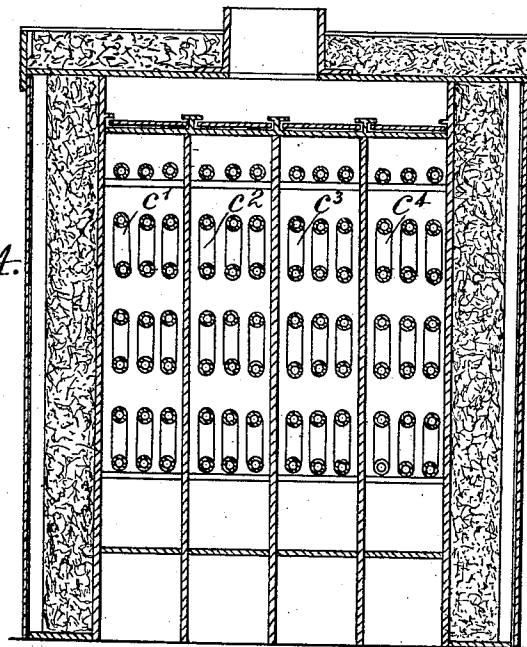


Fig. 4.

Witnesses:

Frederick Kunz
H. M. Bailes

Inventor
George Frederick Humphrey
by W. J. Bissinger attorney

UNITED STATES PATENT OFFICE.

GEORGE FREDERICK HUMPHREY, OF LONDON, ENGLAND.

BAKER'S OVEN AND THE LIKE.

1,060,841.

Specification of Letters Patent.

Patented May 6, 1913.

Application filed January 2, 1913. Serial No. 739,725.

To all whom it may concern:

Be it known that I, GEORGE FREDERICK HUMPHREY, a subject of the King of Great Britain, residing at London, England, have
5 invented certain new and useful Improvements in Bakers' Ovens and the Like, of which the following is a specification.

It has heretofore been set forth in patents that flowing steam or other gaseous fluids,
10 hereinafter designated steam, for convenience, may be superheated without material increase in pressure but with increased velocity of motion or by allowing suitable increase in volume, or both, and this broad
15 idea has been utilized in ovens, rapidly moving low pressure steam being superheated, to increase its velocity, then reduced in velocity in a radiator, of larger cross-sectional area, where it gives up heat, and then dis-
20 charged.

The present invention involves using a plurality of radiators through which the same heating fluid passes in succession being superheated after passing each radiator, to
25 restore the heat which it has lost. It is found that by properly proportioning the different portions of the conduit no material back pressure is produced by such superheating, and an important saving in fuel results, while by the use of proper adjuncts
30 steadiness of any desired heat and perfection of control are attained.

In the accompanying drawings, Figure 1 is a diagrammatic elevation of a plant having double deck ovens with top and bottom heating elements, or radiators, in each oven.
35 Fig. 2 is a diagrammatic plan of the plant of Fig. 1, the radiators, for clearness, being arranged around the superheaters. Figs. 3 and 4 are sectional elevations the sections being in planes perpendicular to each other.

In these figures, *a* represents a boiler or other source of supply for low pressure steam which passes through a pipe *e*, *e'*, a
45 header *b'*, superheater coils *c'* located in a casing *b*, a header *d'* and pipe *f'* to a header *g'*, coils *h'* and header *i'* of a radiator, designated as a whole by I. From the header *i'* a pipe *e²* leads to a second superheater
50 similar to the first and consisting of a header *b²*, coils *c²*, and header *d²*. From this latter header the steam passes by a pipe *f²* to a second radiator II, like the first, and then to the header *b³* of a third superheater, and so
55 on, four radiators, I, II, III, IV, being

shown, although more or less may be used. From the last radiator the steam is discharged through a pipe *e⁵*. The superheater coils *c'*, *c²*, etc., are separately heated from
a space 5 by gaseous or other heating agent. 60 The delivery pipes from the superheaters are provided with valves 6 permitting steam to be blown off while the corresponding superheater is being brought up to working
condition, and by common devices, not 65 shown, any radiator or pair of radiators may be cut out when desired; and the temperature of the ovens may be regulated, within somewhat wide limits, by throttling
the steam passing therefrom. 70

The temperature of the steam in different parts of its path is not the same yet its pressure varies but little and back pressure is practically avoided, a peculiar result essential to the proper operation of the series arrangement and one not ordinarily thought
75 obtainable. In practical use of the apparatus I have secured a great saving of fuel over ordinary oven arrangement and over analogous devices with the radiators in parallel. 80

It is evident that since the steam supplied to all the superheaters after the first is at a higher temperature than when it is delivered to the first superheater by the boiler, 85 less heat is required for these heaters than for the first. It has been found that in order to secure the proper velocities and temperatures at all points the proportions of the cross-sectional areas may be 1 for the
90 pipe *e*, 9 for the headers and coils *b'*, *d'*, *h'*, $3\frac{1}{2}$ for the coils *c'*, 4 for the pipe *f'*, and $2\frac{1}{2}$ for the pipe *e²*.

What I claim is:

1. The combination with an oven provided with a plurality of fluid heated radiators arranged in series of independent means for superheating the fluid between
95 successive radiators.

2. In oven construction, the combination with two radiators located in the baking space and adapted to be heated by fluid flowing through them, of two fluid superheaters without said space and having their cross-sectional fluid-passage areas materially less than those of said radiators, a conduit from the first superheater to the first radiator, a conduit leading from the first radiator to the second superheater, a conduit leading from the second superheater
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to the second radiator, and a conduit leading from the second radiator out of said space.

3. The combination with a plurality of
5 ovens provided with internal radiators, of conduits connecting all the radiators in series with a source of low pressure steam, and superheaters interposed in said conduits between successive ovens and having fluid pas-

sages of less cross-sectional area than the 10 passages of the radiators.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE FREDERICK HUMPHREY.

Witnesses:

SAMUEL JOHN CLARKE,

EDWARD ALLBRIGHT ROBINSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
