

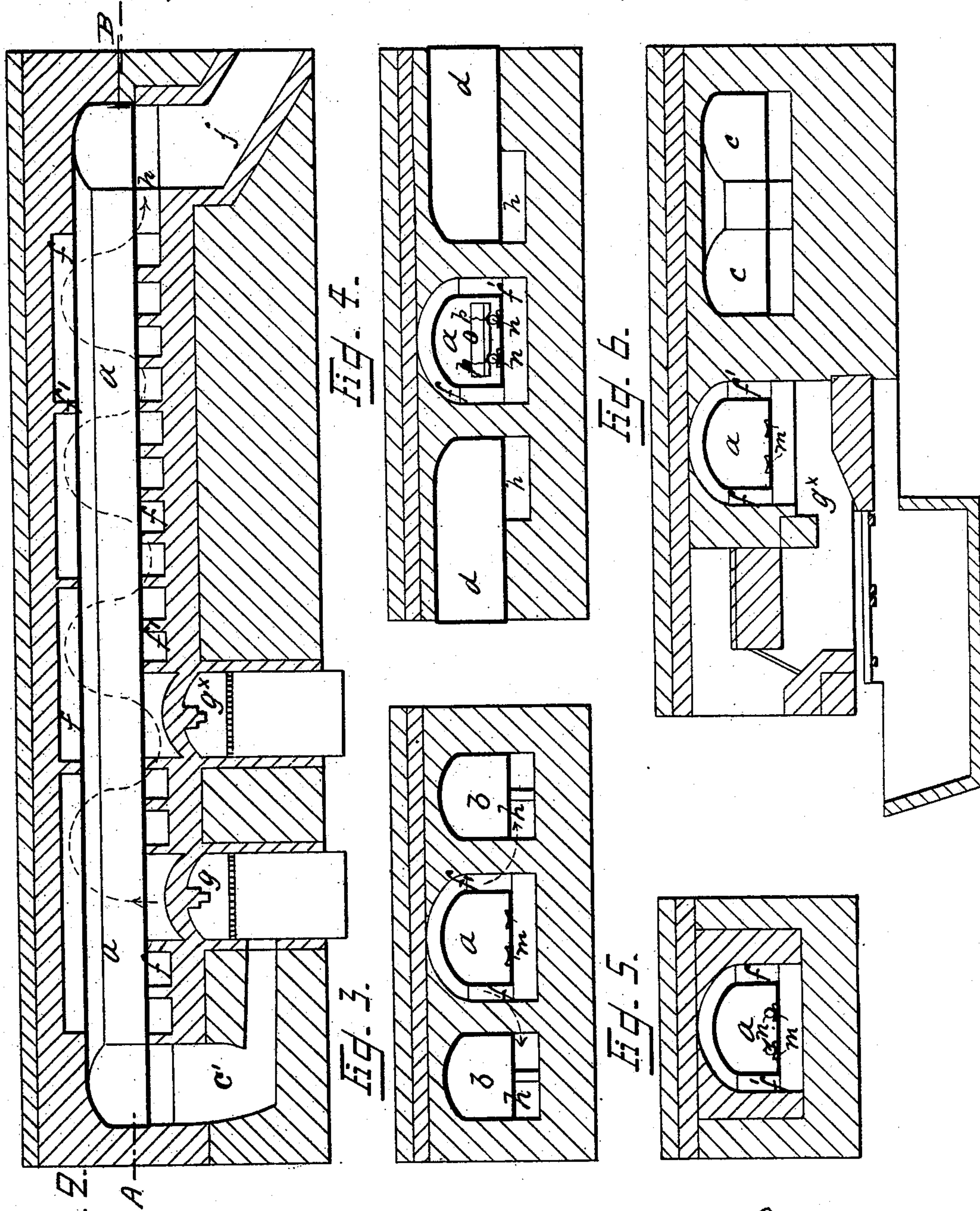
(No Model.)

2 Sheets—Sheet 2.

F. HANCOCK & C. B. WINZER.
POTTERY MUFFLE OR KILN.

No. 588,987.

Patented Aug. 31, 1897.



Witnesses:

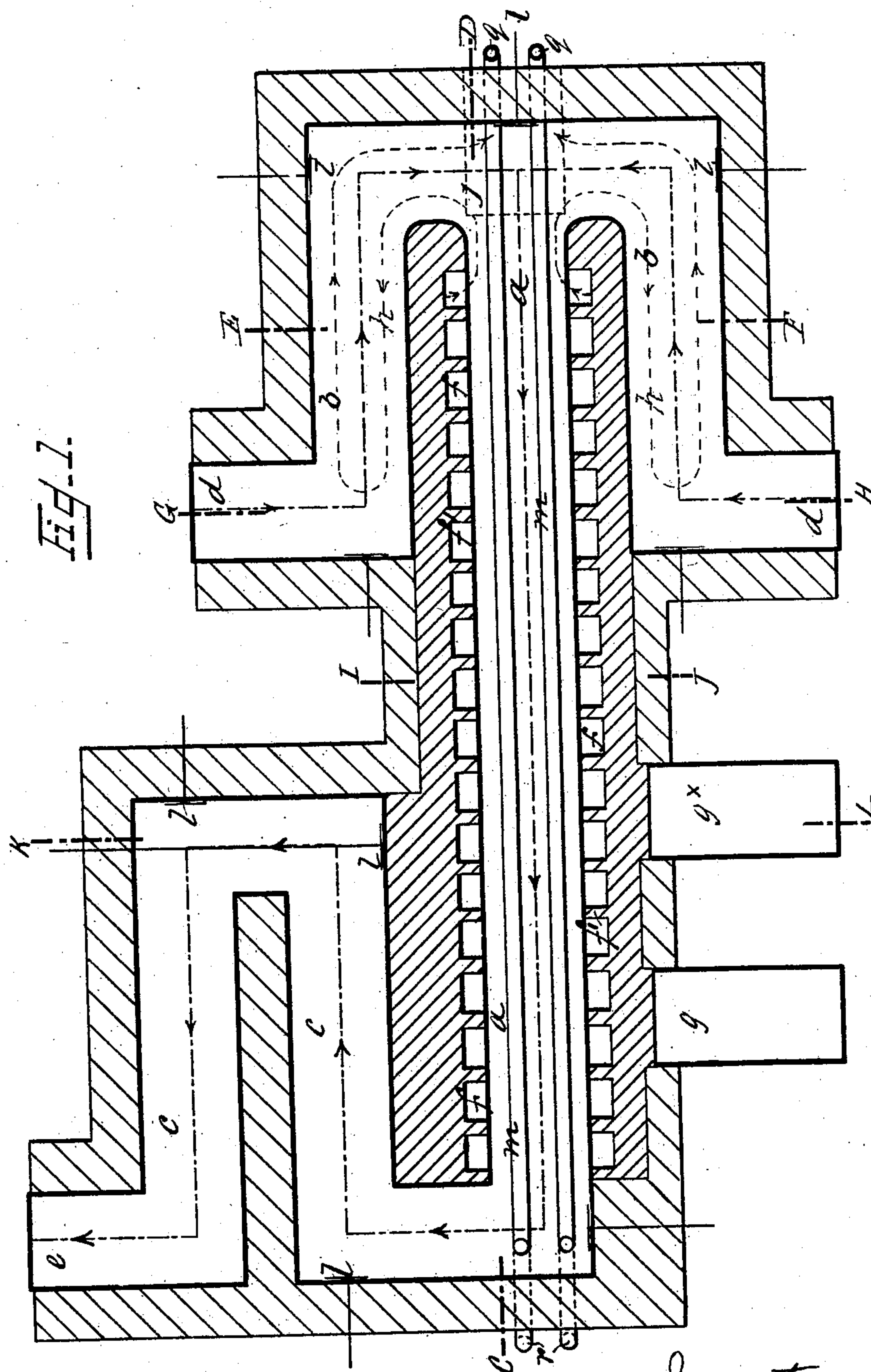
W. C. Pruckney
C. Halloway

Inventor:
Frederick Hancock,
Charles Burton Winzer,
By J. M. Dornen
att'y

2 Sheets—Sheet 1.

No. 588,987.

Patented Aug. 31, 1897.



Witnesses:

W. C. Pruckney
C. Halloway

Inventors:

Frederick K Hancock,
Charles Burton Winger

By John D. Bower atty.

UNITED STATES PATENT OFFICE.

FREDERICK HANCOCK, OF BURSLEM, AND CHARLES BURTON WINZER, OF
SHELTON, ENGLAND.

POTTERY MUFFLE OR KILN.

SPECIFICATION forming part of Letters Patent No. 588,987, dated August 31, 1897.

Application filed February 9, 1897. Serial No. 622,616. (No model.)

To all whom it may concern:

Be it known that we, FREDERICK HANCOCK, a subject of the Queen of Great Britain and Ireland, a resident of Burslem, and CHARLES BURTON WINZER, a subject of the Emperor of Germany, and a resident of Shelton, county of Stafford, England, have invented certain new and useful Improvements in Pottery Muffles or Kilns, of which the following is a specification.

This invention relates to improvements in muffles or kilns used for pottery and analogous purposes, the objects of the invention being to enable such kilns to be made of a much longer range than is practicable with existing arrangements thereof and to avoid the liability of the ware being cracked or damaged by sudden differences of temperature within the kiln by insuring a more gradual heating and a more gradual cooling of the ware in treatment, due in part to the increased range of the kiln and of its warming and cooling adjuncts, and in part to the improved arrangement of such adjuncts relatively to the main or hot chamber, and also to render the kiln utilizable for gloss-firing, hardening-on, enameling, and gold-firing in the manufacture of ceramic ware.

On the accompanying drawings, Figure 1 represents a sectional plan on the line A B, Fig. 2. Fig. 2 represents a sectional elevation on line C D, Fig. 1. Fig. 3 represents a like view on line E F; Fig. 4, a like view on line G H; Fig. 5, a like view on line I J, and Fig. 6 a like view on line K L.

a is the main firing-chamber, which may be of any desired length.

b b are duplicate warming-chambers which are built at one end of and respectively on opposite sides of the chamber *a*, with the adjacent end of which they communicate and from which communication they return alongside of and are built adjacent to the outer sides of the chamber *a* to their inlets *d*.

c is a cooling-chamber which is built at the other end of and on one side of the chamber *a*, with the adjacent end of which it communicates and from which communication it returns alongside of and is built adjacent to the outer side of the chamber *a* and is doubled back upon itself to its outlet *e*. It has an

under passage *c'*, through which air for gradually cooling the ware circulates and discharges under the furnace *g*.

For the whole length of the chamber *a*, except where it connects with the chambers *b c*, its walls are made as flue-passages *f*, which are formed by top, bottom, and side baffles or partitions *f'*, which serve to conduct the furnace-gases from the furnace or furnaces *g* (which is or are situated at or nearest adjacent to the ware-outlet end of the chamber *a*) upward and downward and well around the outer side of the chamber *a* repeatedly (*vide* the dotted lines, Fig. 2) until, on arriving at the ware-inlet end of the chamber *a*, they pass into wing-channels *h*, Fig. 1, constructed under the warming-chambers, and along which they return and are led through a channel *j* to a chimney.

By such relative arrangements of the chambers *a b* we effect a better graduation and a more regular dispersion of the heat, and consequently obtain a more gradual warming of the ware in the chambers *b* before it enters the firing-chamber *a*, and we consequently obtain a more economical working of the kiln and obviate many difficulties which have hitherto been practically experienced with continuous-working muffles, in which, as hitherto constructed and fired, the thicker and larger goods are very liable to collapse through being too suddenly subjected to the heat of the firing-chamber.

When firing for hardening or enameling purposes, one furnace *g* will suffice; but if it is required to obtain a sufficient heat to fire-gloss ware, then a further furnace or furnaces *g'* would be necessary and should be constructed close adjacent to the furnace *g* on the side thereof toward the ware-inlet end of the chamber *a*. (*Vide* Fig. 1.)

By the aforesaid relative arrangement of the chambers *a c* is insured a more gradual cooling of the ware before it emerges from the kiln and is subject to the atmospheric temperature, and consequently the ware is rendered much less liable to crack or to become damaged in its passage from the firing-chamber to the atmosphere.

The gradual treatment of the ware in the improved kiln is, as aforesaid, due in part to

the increased range of the firing-chamber, which permits of the warming and cooling chambers being returned and built alongside of the firing-chamber, as distinguished from
 5 being built at right angles thereto, as is customary, and this is further operative in insuring a considerable economy in the quantity of fuel required. Such long range of firing-chamber has not been practicable on
 10 account of the great weight of the carriers of ware under treatment and of the difficulty of pushing a series thereof along the chamber with the usual appliances without great liability of damaging the ware.

15 We render the increased range of kiln practicable by forming along the floor of the firing-chamber (and, if required, also along the floor of the warming and cooling chambers) parallel grooves *m*, adapted to support a series of balls *n* of fire-clay or other suitable refractory material, which serve to support the ware-carriers *o*. The bottoms of the carriers may also be formed with grooves *p*, adapted to rest on the balls *n*. By such
 20 means we reduce the friction and facilitate the propulsion of the ware-carriers by the usual appliances *l* to such an extent as to enable us to construct the firing-chamber of a much greater range than is customary.

30 The balls *n* may be supplied to the grooves *m* through a tubular channel *q* and may escape therefrom through other channels *r*.

We claim as our invention in muffles or kilns for pottery and analogous purposes—

35 1. In combination, a firing-chamber *a*, surrounded with flues for its entire length, and

having duplicate warming-chambers *b*, built at one end and on opposite sides of and doubled back alongside the chamber *a*, to their inlets *d*, and a cooling-chamber *c*, at the other
 40 end and on one side of and alongside the chamber *a*, and doubled back on itself to its outlet *e*, as set forth.

2. In combination, a firing-chamber *a* surrounded with flues for its entire length, and
 45 having duplicate warming-chambers *b* built at one end and on opposite sides of the chamber *a*, a cooling-chamber *c* at the other end and on one side of the chamber *a*, the chamber *a* having longitudinal parallel grooves *m*
 50 adapted to receive series of balls for supporting the ware-carriers, as set forth.

3. In combination, a firing-chamber *a*, surrounded with flues for its entire length, and
 55 having duplicate warming-chambers *b*, built at one end and on opposite sides of and doubled back alongside the chamber *a*, to their inlets *d*, and a cooling-chamber *c*, at the other end and on one side of and alongside of the chamber *a*, the chamber *a*, and the cham-
 60 bers *b*, *c*, having parallel grooves *m*, adapted to receive series of balls of fire-clay or other refractory material for supporting the ware-carriers, as set forth.

Signed at Burslem, Staffordshire, England, 65 this 10th day of December, 1896.

FREDERICK HANCOCK.
 CHARLES BURTON WINZER.

Witnesses:

WENDELL C. WARNER,
 JOHN HENRY COPESTAKE.