

W. B. HUGHES.

KILN FOR BURNING BRICKS, TILES, OR POTTERY.

APPLICATION FILED OCT. 28, 1901.

NO MODEL.

2 SHEETS—SHEET 1.

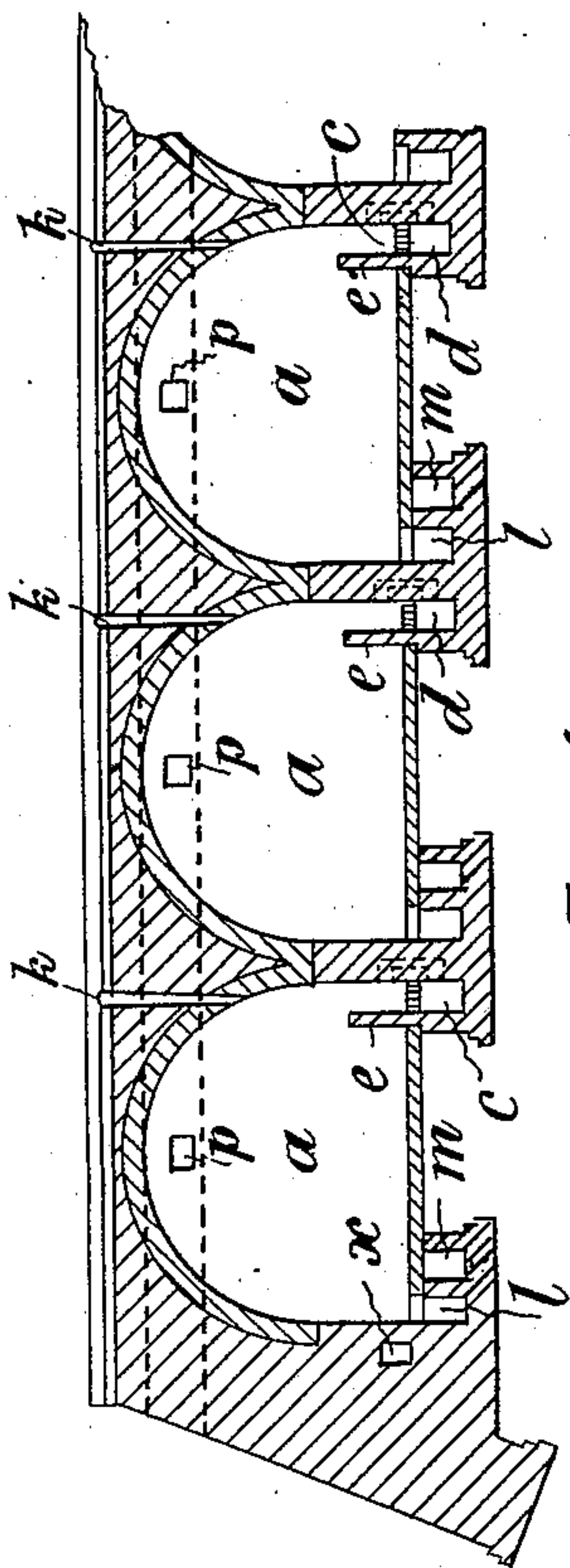


FIG. 2.

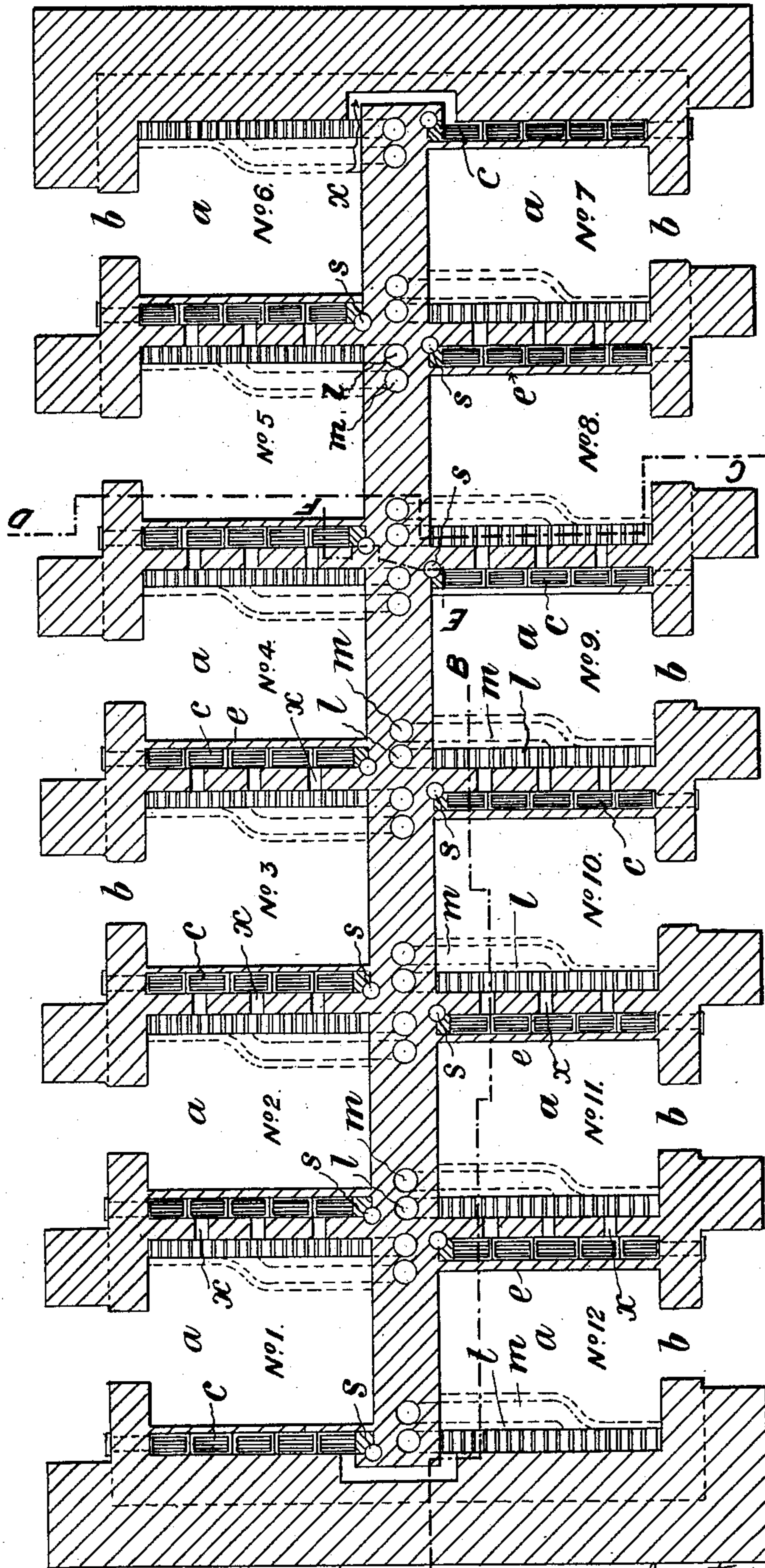


FIG. 1.

Witnesses:
Attest
Chas. Summers

Inventor
William Barnaby Hughes.

By *[Signature]*
Att'y

No. 744,200.

PATENTED NOV. 17, 1903.

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2 SHEETS—SHEET 2.

FIG. 4.

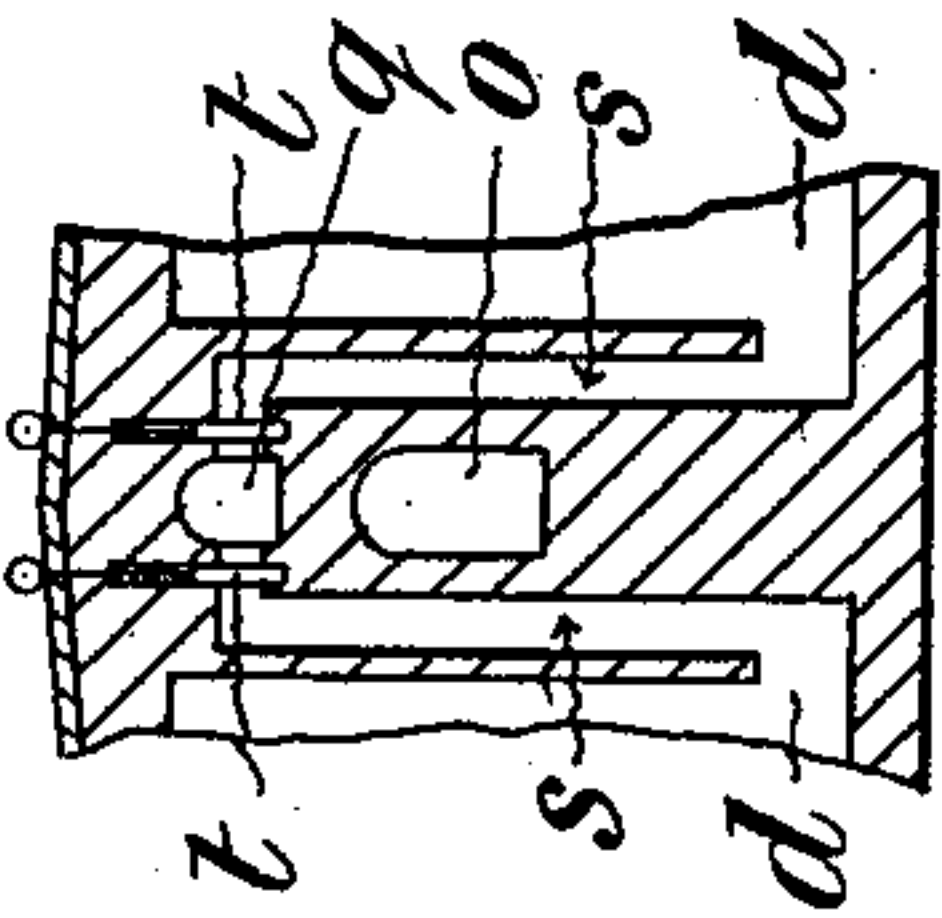


FIG. 6.

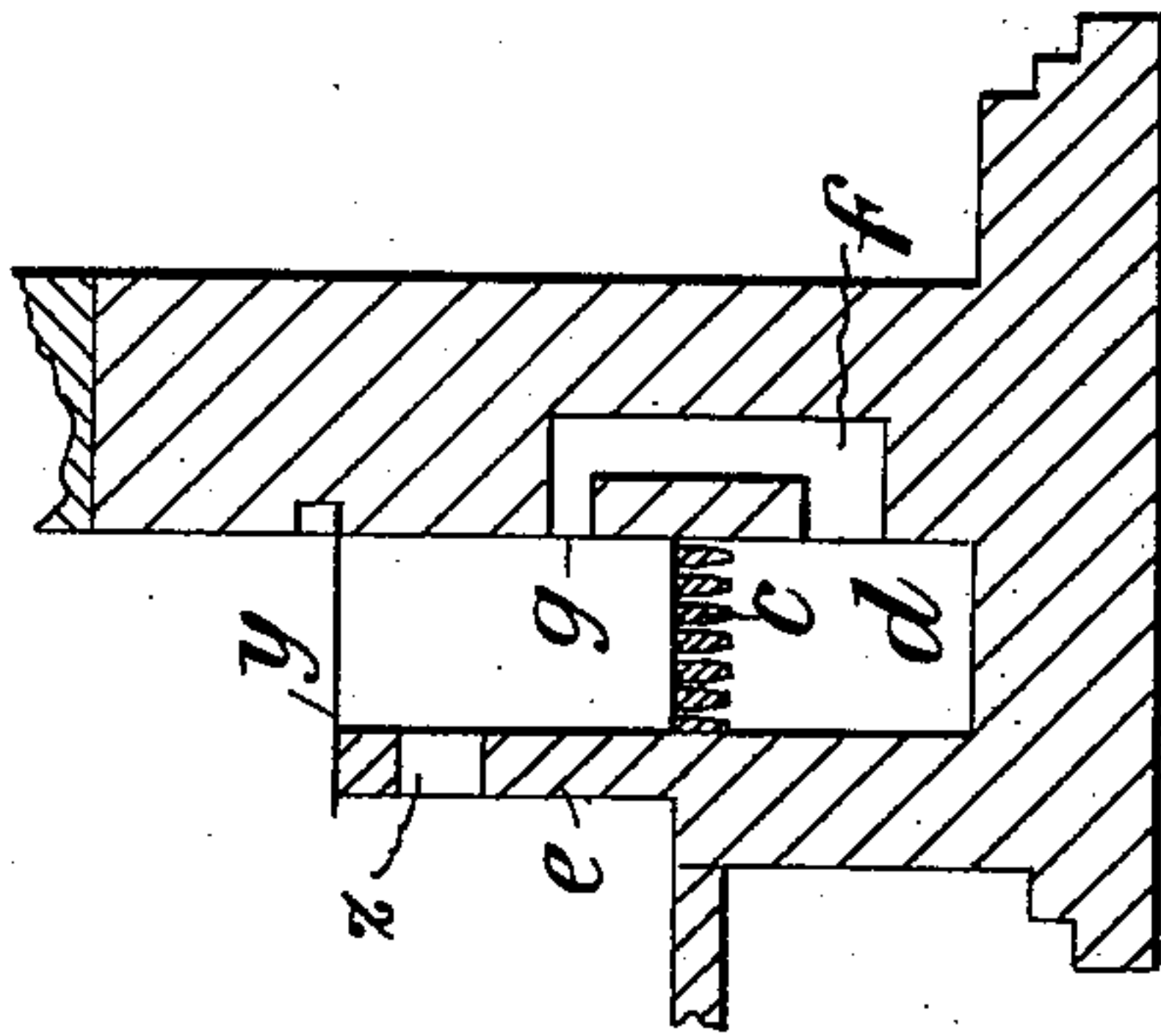


FIG. 3.

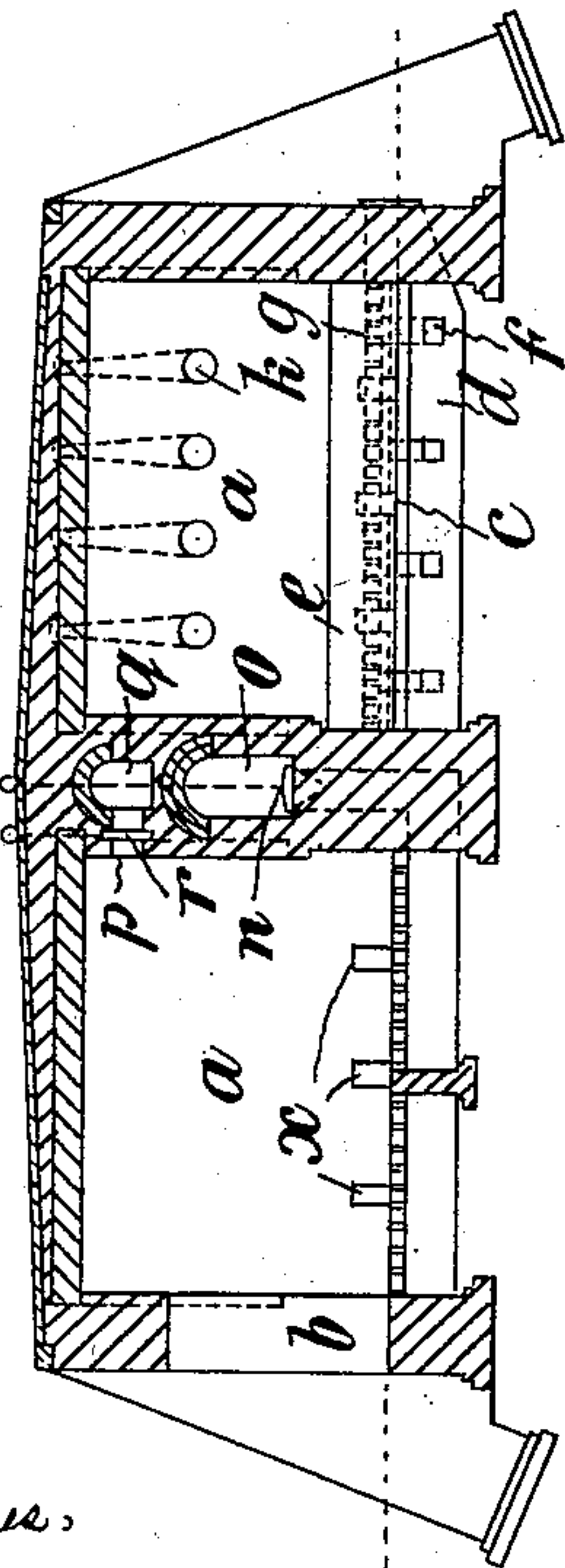
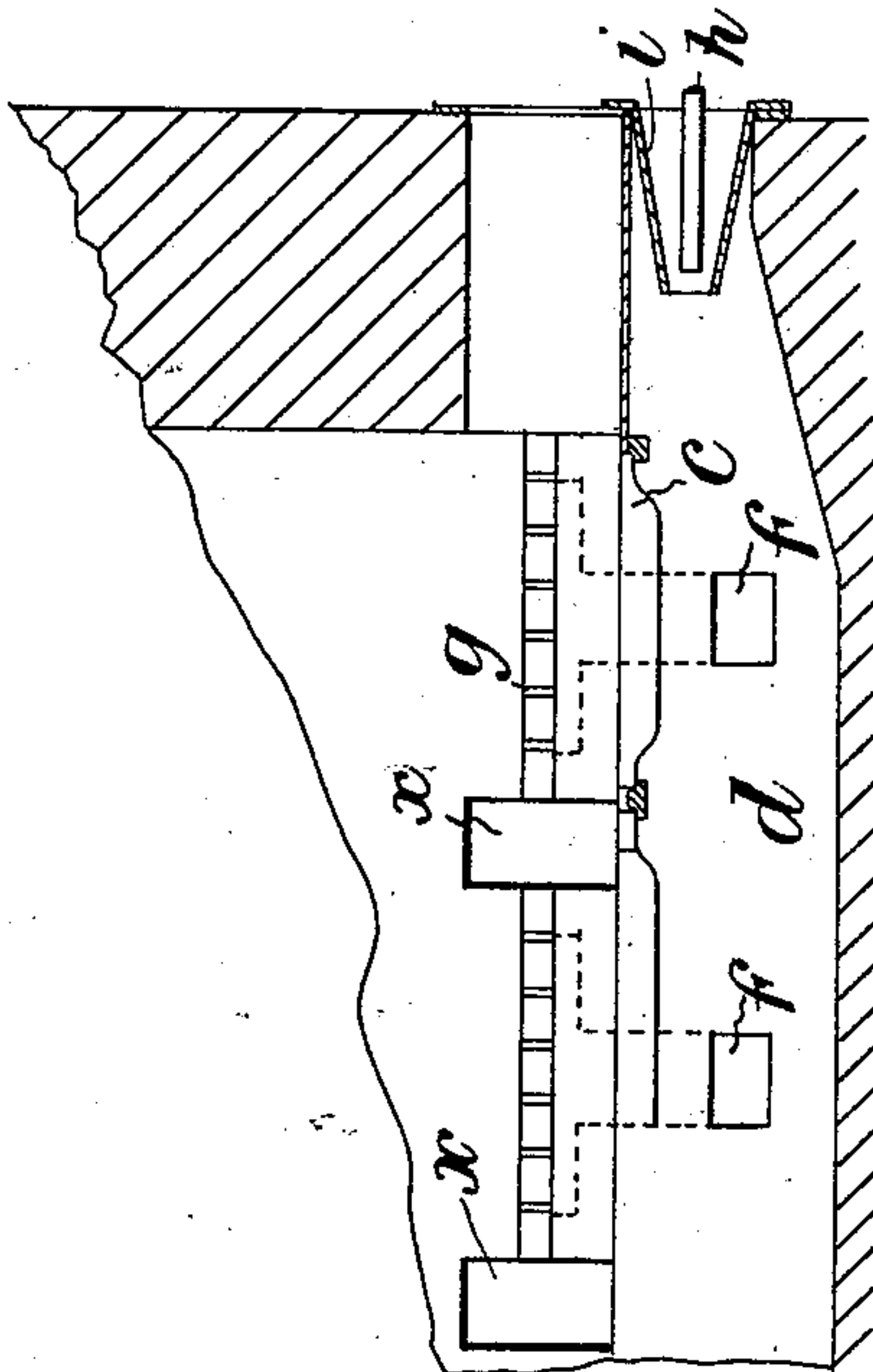


FIG. 5.



Witnesses,
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C. H. Summers

Inventor,
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UNITED STATES PATENT OFFICE.

WILLIAM BARNESLEY HUGHES, OF TUNBRIDGE WELLS, ENGLAND.

KILN FOR BURNING BRICKS, TILES, OR POTTERY.

SPECIFICATION forming part of Letters Patent No. 744,200, dated November 17, 1903.

Application filed October 28, 1901. Serial No. 80,313. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BARNESLEY HUGHES, surveyor, a subject of the King of Great Britain and Ireland, residing at Prospect Lodge, London road, Tunbridge Wells, in the county of Kent, England, have invented new and useful Improvements in and Connected with Kilns for Burning Bricks, Tiles, or Pottery, of which the following is a specification.

My invention relates to the construction and arrangements of continuous kilns and furnaces for drying and burning bricks, tiles, and pottery whereby I am enabled to employ in an economical manner the heat from one chamber in a kiln when not further required in that chamber to raise the temperature in another chamber, and my invention also relates to the employment of a heated air-blast.

Figure 1 of the accompanying drawings represents in plan section a kiln constructed according to my invention. Fig. 2 is a longitudinal section on the line A B, Fig. 1. Fig. 3 is a transverse section on the line C D, Fig. 1. Fig. 4 is a transverse section on the line E F, Fig. 1. Fig. 5 is a transverse section of the fire-chamber, and Fig. 6 is a longitudinal section thereof.

According to my invention I construct a kiln consisting of a number of, say, rectangular chambers *a*, which run transversely to the length of the kiln, or radially if the kiln be circular, each of which chambers is provided with a doorway *b* and a door (not shown) for introducing the goods to be burned, a furnace with a grate *c*, extending, say, the whole of one of the longest sides of the chamber, and beneath the grate-bars is an ash-pit *d*. The furnace is provided with a low screen wall or partition *e*, parallel with the side of the chamber, to keep the fuel in place on the fire-bars and to prevent it from coming into contact with the goods to be burned. Below the level of the bars I construct in the side wall of the ash-pit four or more flues *f*, as shown more clearly in the detail views, Figs. 5 and 6, which flues are carried up vertically and then horizontally parallel to the fire-bars, with narrow apertures, such as outlets *g*, to allow a current of heated air generated, for

example, by a blast passing through a pipe *h* and causing air to pass through a nozzle *i* into the ash-pit, up the flues *f*, and to pass over the fires in each fire-chamber to assist the combustion of gases as they arise from the fuel in process of burning. The furnace and ash-pit are both provided with a door, if desired, and the wall opposite the furnace above the fire-bars is provided with lateral apertures *x*, so that the chambers may communicate with each other; but a current is not produced into an adjoining chamber while the dampers are closed in the latter. The chambers are preferably built in the form of arches and are provided with a number of holes *k* above the furnaces for the purpose of feeding the fuel onto the grates, or the fuel may be fed in by opening the furnace-doors. On one side under the bottom of each chamber there are built, say, two flues *l* and *m* for carrying away the products of combustion and vapor. As shown in Fig. 1, the flue *l* communicates with approximately one-half of the openings in the floor of the chamber, while the flue *m* communicates with the remainder. By closing the damper of one flue all the "pull" of the chimney-shaft may be put upon the other flue, or the dampers may be regulated to produce any desired amount of pull upon either flue, and in this way the products of combustion can be caused to pass in various directions across the kiln. Each flue is continued vertically and is at the top provided with a damper *n* or valve for regulating the exit of the products of combustion and the like, and at the top all the said flues from each chamber communicate with the main flue *o*, whence the products of combustion may pass away to the shaft or chimney in any convenient manner. Each chamber is provided near the top with a passage *p*, leading to a main or common horizontal flue *q*, closed at both ends and situated, preferably, above the main flue. Each passage has a damper or shutter *r*, so that the heat from a chamber may be allowed to escape into the main hot-air flue *q* or not, as required, and in order that the heat from the main hot-air flue may be utilized in the best manner each chamber is also in communication near the ground and preferably under the fire-bars

with said main hot-air flue by means of a vertical passage *s*, Fig. 4, each passage being of course provided with a door or damper *t* in order to allow of the regulation of the inlet
5 of hot air.

Further, the invention consists in the application under the dead-plate level and the bars of a blast of heated air generated by either oil or gas with or without mechanical
10 power, which blast is admitted by a funnel-shaped cone, admitting at the same time and with the blast generated with oil, gas, or other combustibles cold air, which becomes heated by amalgamation in its passage through the
15 cone or funnel and is passed into the ash box or chamber under the fire-bars.

Further, the invention consists in the application of a blast of air which is heated in any convenient manner, such blast preferably being passed, as shown in Fig. 5, into the ash pit or chamber under the fire-bars and thence into the fire to assist the combustion. It is necessary that the air should be heated, and the blast of air may suitably, as shown,
25 be supplied through a device somewhat on the principle of the injector, so that a comparatively small volume of hot air may induce a current of cold air and mixing with it warm the same on its way to the fire.

Now by my invention I am enabled to burn to any degree of heat in any one chamber, as desired, and to dry bricks in another or other chambers.

In drying bricks I prefer to proceed as follows: The floor of chamber No. 1 is, for example, set direct from the brick-making machine with, say, six or more courses of bricks. Hot air from the main hot-air flue *q* is allowed to come into the ash-pit *d* of the chamber by
40 the inlet-passage *s*, the top of the furnace being covered with a shutter or shutters *y*, so that the current of hot air is forced to pass through the lateral apertures *z* in the screen-wall *e*. (See Fig. 6.) One or more of the dampers *n* in the main flue *o* are opened, and thus a current of warm air is caused to pass through the bricks aforesaid. These six layers of bricks are dried, say, in a night. The next morning the center part of the chamber will
50 be "crowded" with bricks which have been previously dried more or less, and then the top section of the chamber may be crowded with bricks direct from the machine. By this means it is evident that I am enabled to fill the chamber at least two-thirds full with
55 "green" plastic bricks direct from the machine.

By my invention I am enabled to effect a saving in fuel generally, and fuel of an inferior character may be partially or wholly employed. Further, it is evident that the fires may be "clinkered" without admitting any cold air into a chamber by closing the valves *n* before opening the furnace-door.

Besides this the chambers can be so isolated
65 that no steam can pass from one to the other.

What I claim, and desire to secure by Letters Patent, is—

1. A continuous kiln comprising a plurality of chambers, a furnace in and at one side of
70 each chamber, a screen-wall to prevent the fuel in the furnace from coming into contact with the goods to be burned, an ash-pit below each furnace, flues, each with a plurality of branches leading from an ash-pit of a furnace and opening into the fire-space above
75 said ash-pit, a main flue for receiving the heated air, passages, one in each chamber, for the exit of the heated air from the chambers to the main flue and a plurality of flues
80 communicating with said main flue and each leading to an ash-pit, substantially as and for the purposes set forth.

2. A continuous kiln comprising a plurality of chambers, a plurality of furnaces one in
85 each chamber, a screen-wall to prevent the fuel in the furnace from coming into contact with the goods to be burned, exit-openings for the escape of the products of combustion, a plurality of flues in each chamber each one
90 of said flues communicating with some of said exit-openings, dampers for controlling said flues, an ash-pit below each furnace, flues with a plurality of branches communicating with the ash-pit and fire-space of the
95 furnace, a plurality of flues one in each chamber for the exit of heated air from the chambers, a main flue for receiving the heated air, and a plurality of flues communicating with said main flue and each leading to an ash-pit, substantially as set forth. 100

3. A continuous kiln comprising a plurality of chambers, a plurality of furnaces one in each chamber, a screen-wall to prevent the fuel in the furnace from coming into contact
105 with the goods to be burned, exit-openings for the escape of the products of combustion, a plurality of flues in each chamber, each one of said flues communicating with some of said exit-openings, dampers for controlling
110 the said flues, an ash-pit below each furnace, a hot-air-forcing device at the mouth of each ash-pit, flues with a plurality of branches communicating with the ash-pit and fire-space of the furnace, a plurality of flues one in
115 each chamber for the exit of heated air from the chambers, a main flue for receiving the heated air and a plurality of flues communicating with said main flue and each leading to an ash-pit, substantially as set forth. 120

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

WILLIAM BARNESLEY HUGHES.

Witnesses:

GEORGE ISAAC BRIDGES,
V. JENSEN.