H. HILLEBRAND.

ANNEALING FURNACE.

APPLICATION FILED JUNE 6, 1914.

1,166,684. Patented Jan. 4, 1916.

FIG. 1.

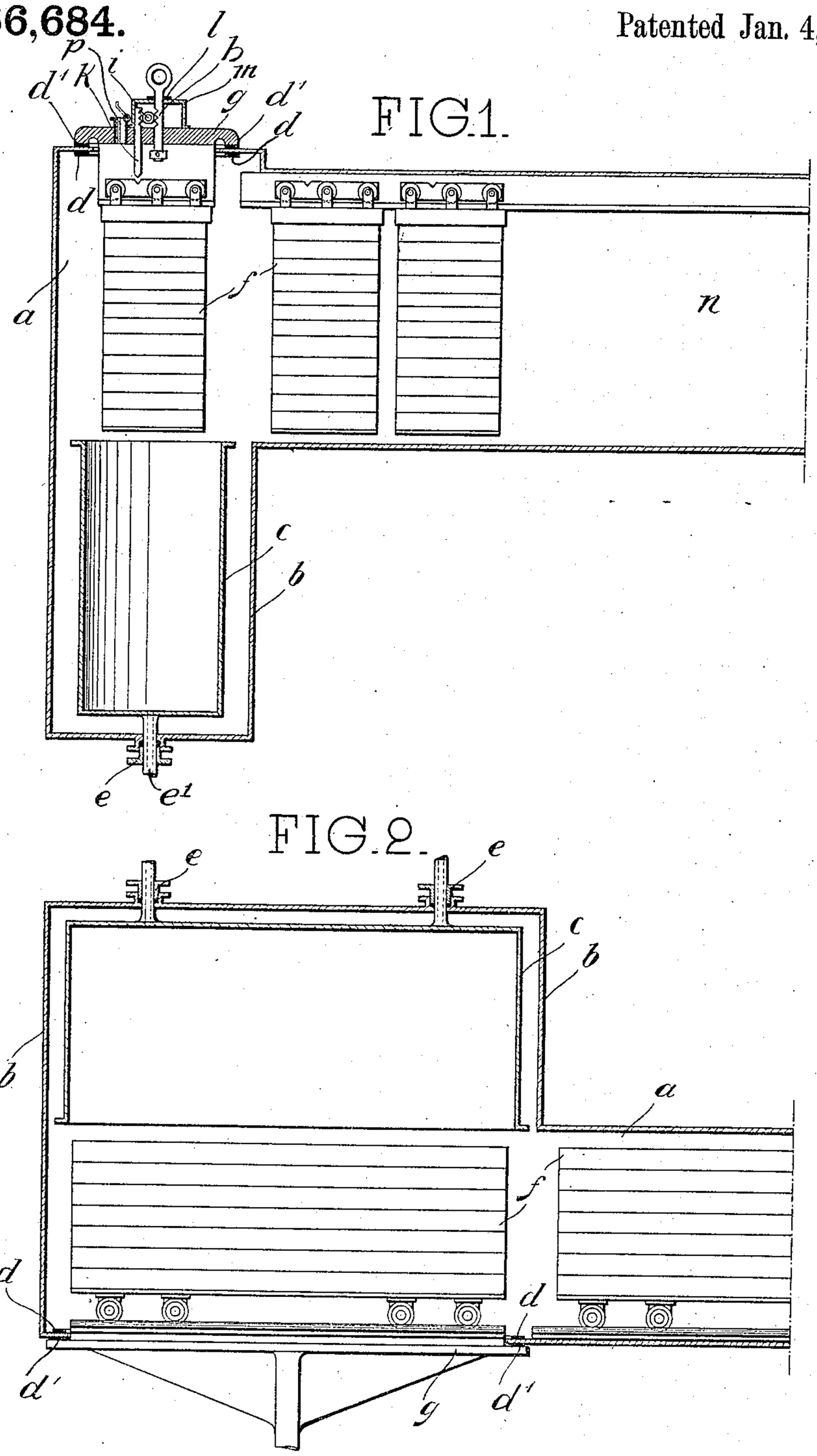

FIG. 2.

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UNITED STATES PATENT OFFICE.

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ANNEALING-FURNACE.

1,166,684. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed June 6, 1914. Serial No. 843,376.

To all whom it may concern:

Be it known that I, HERMANN HILLEBRAND, a subject of the German Emperor, residing at Werdohl, Westphalia, Germany, have invented an Improved Annealing-Furnace, of which the following is a specification.

This invention relates to an annealing furnace of novel construction in which the annealing retort and annexed antechamber are cut off from the atmosphere during charging or discharging by an inclosed interior bell and an exposed exterior lid from which the charge-carrier is adapted to be suspended.

The invention permits the furnace to be readily controlled and to be continuously worked without ever causing the retort and annexed antechamber to come into communication with the outside air.

The invention also comprises the various other features of construction more fully pointed out in the specification and appended claims.

In the accompanying drawing: Figure 1 is a vertical longitudinal section of part of an annealing furnace embodying my invention, and Fig. 2 a similar section of a modification.

One end of the usual annealing retort *n* of the furnace communicates with a charging ante-chamber adapted for the reception and removal of the articles to be annealed. This ante-chamber is prolonged vertically to form a pocket *b*, in which is accommodated a vertically movable bell *c* which may be operated by a tubular shaft *e* that passes through a stuffing box *e*. In the upper side of the ante-chamber there is formed a charging opening, which is surrounded by an interior packing *d*, which is adapted to form an air tight joint, with the upper flanged end of bell *c*. The charging opening may be closed by an outer, exteriorly accessible lid *g* which bears against an exterior packing *d'*, surrounding the charging opening so as to here likewise form an air tight closure. From lid *g* there depends a rail, upon which the carrier *f* for the charge is adapted to travel, such rail, being, in the closed position of the lid alined with a corresponding rail in retort *n*, so that the carrier may be readily shifted from the lid through the ante-chamber over and then into the retort and vice versa.

Means are provided for locking the carrier to the lid, while the latter is being manipulated, and for automatically releasing it therefrom, after the lid has become sealed. As shown, the lid is provided with a bail *m* apertured for the passage of a vertically movable shank *h* which is packed as at *l* and terminates at its upper end in an eye from which the lid is adapted to be suspended. At its lower end the shank is furnished with a nut or stop that limits the play of the shank, and likewise serves to weight the same. Shank *h* is provided with a number of teeth to here constitute a rack which is intergeared with a toothed bolt *k* by means of a pinion *i*. This bolt projects through lid *g*, and is adapted to engage a notch in carrier *f*, so as to lock the latter to the lid.

When the lid is suspended above the furnace by means of the eyed shank, bolt *k* is forced downward by pinion *i*, so as to lock the carrier to the lid. As soon as the lid has become seated, and the pull on shank *h* has been accordingly relaxed, the shank, owing to its weight, will descend, and thus raise the bolt, so that in this way the carrier becomes automatically unlocked.

In use, bell *c* is raised against packing *d*, the lid *g* carrying the charge is closed upon packing d^1, the bell is filled by tubular shaft e^1 with a neutral gas to drive out the air, that escapes through vent *p* and then the bell is lowered, and the carrier is pushed forward through the ante-chamber over and into retort *n*. The removal of the charge is accomplished in a similar manner by pushing the carrier out of the retort into the ante-chamber, so as to become resuspended from the lid, closing the ante-chamber by raising the bell, and then lifting the lid together with the carrier.

In the embodiment of the invention shown in Fig. 2, the retort and pocket *b* extend not below, but above the ante-chamber. In this case the charge carrier rests upon the bottom of the ante-chamber, which is furnished with the interior packing *d* for the bell *c* and with the exterior packing d^1 for the lid *g*.

I claim:

1. An annealing furnace comprising a retort, a chamber communicating therewith and having one end provided with a charging opening, a bell movable within the chamber and adapted to close against the inner face of said end, a lid adapted to close

against the outer face of said end, and a carrier adapted to be suspended from the lid and to be moved through the ante-chamber into the retort.

2. An annealing furnace comprising a retort, a communicating chamber having one end provided with a charging opening, said chamber being extended vertically beyond said opening, a vertically movable bell inclosed within the chamber, a lid, a carrier adapted to be suspended from the lid, and to be moved through the ante-chamber into the retort, an interior packing on the chamber-end adapted to be engaged by the bell, and an exterior packing on said end adapted to be engaged by the lid.

3. An annealing furnace comprising a retort, a chamber communicating therewith and having one end provided with a charging opening, a bell movable within the chamber, and adapted to close against the inner face of said end, a lid adapted to close against the outer face of said end, a carrier, a vertically movable suspending shank carried by the lid, and a bolt operably connected to said shank and adapted to engage the carrier.

4. An annealing furnace comprising a retort, a chamber communicating therewith and prolonged vertically beyond the retort, a charging opening in one end of the chamber, a bell movable within the chamber and adapted to close against the inner face of said end, a lid adapted to close against the outer face of said end, and a carrier adapted to engage the lid and to be moved from the chamber into the retort.

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

HERMANN HILLEBRAND. [L. S.]

Witnesses:
HELEN NUFER,
ALBERT NUFER.