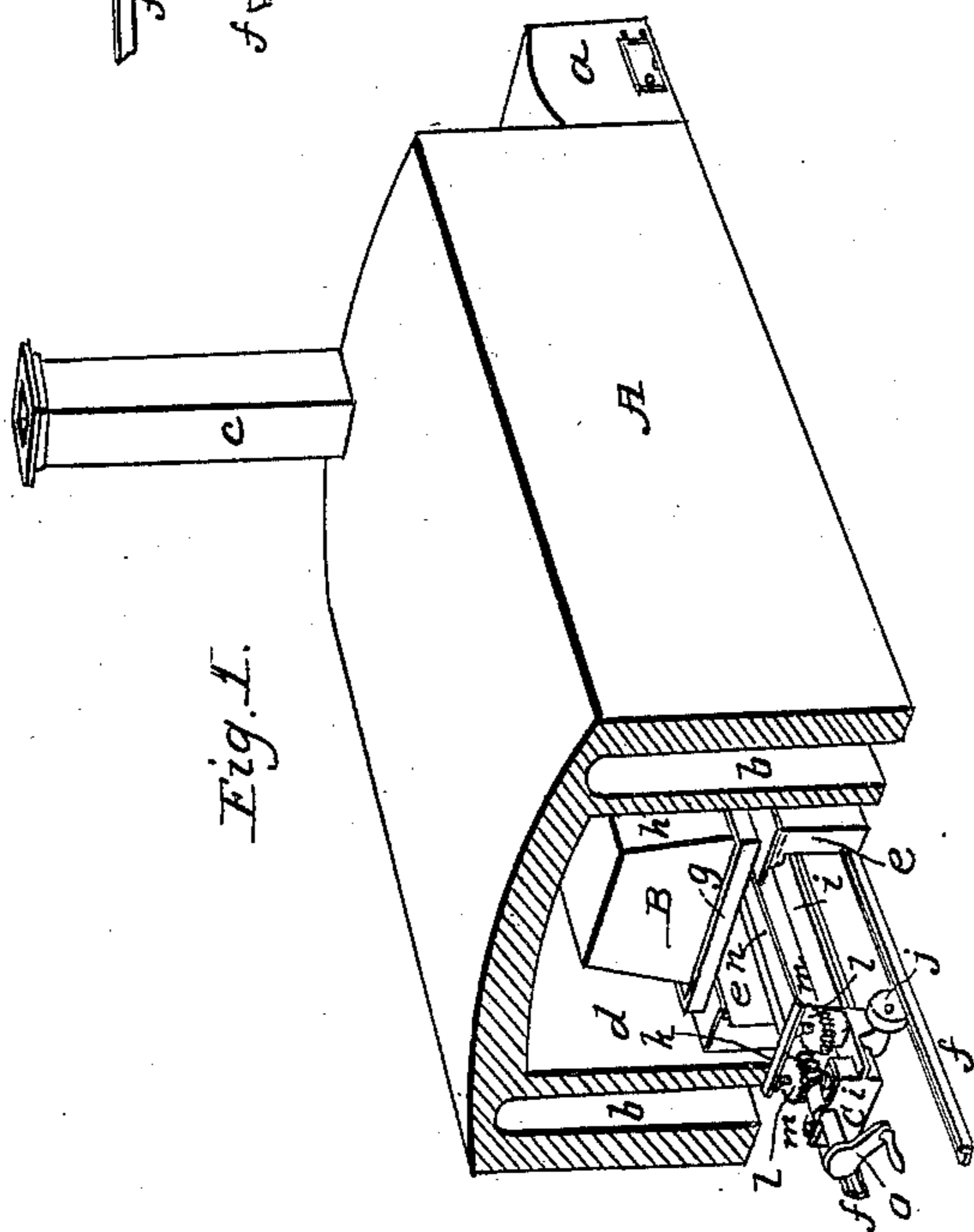
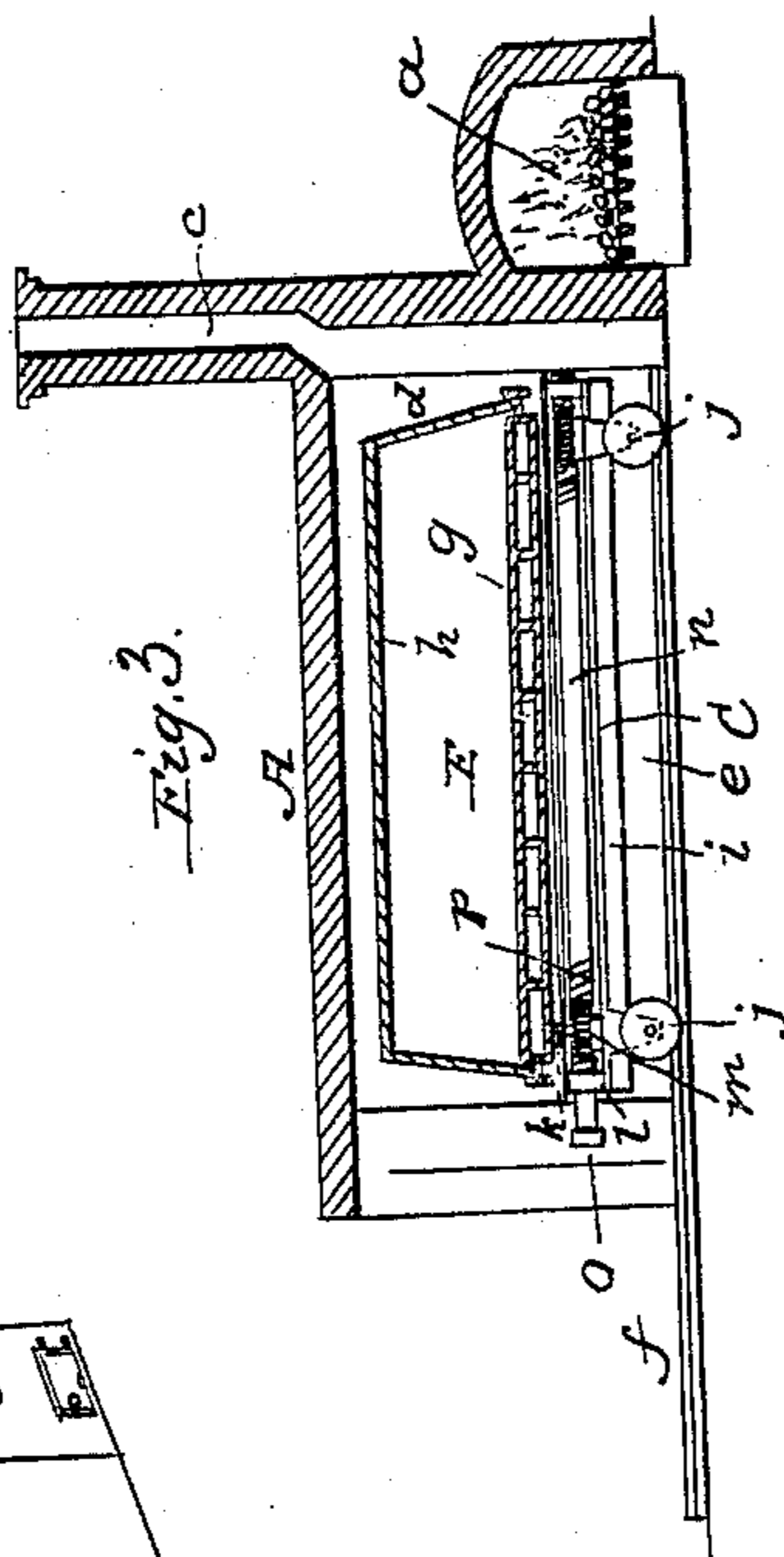
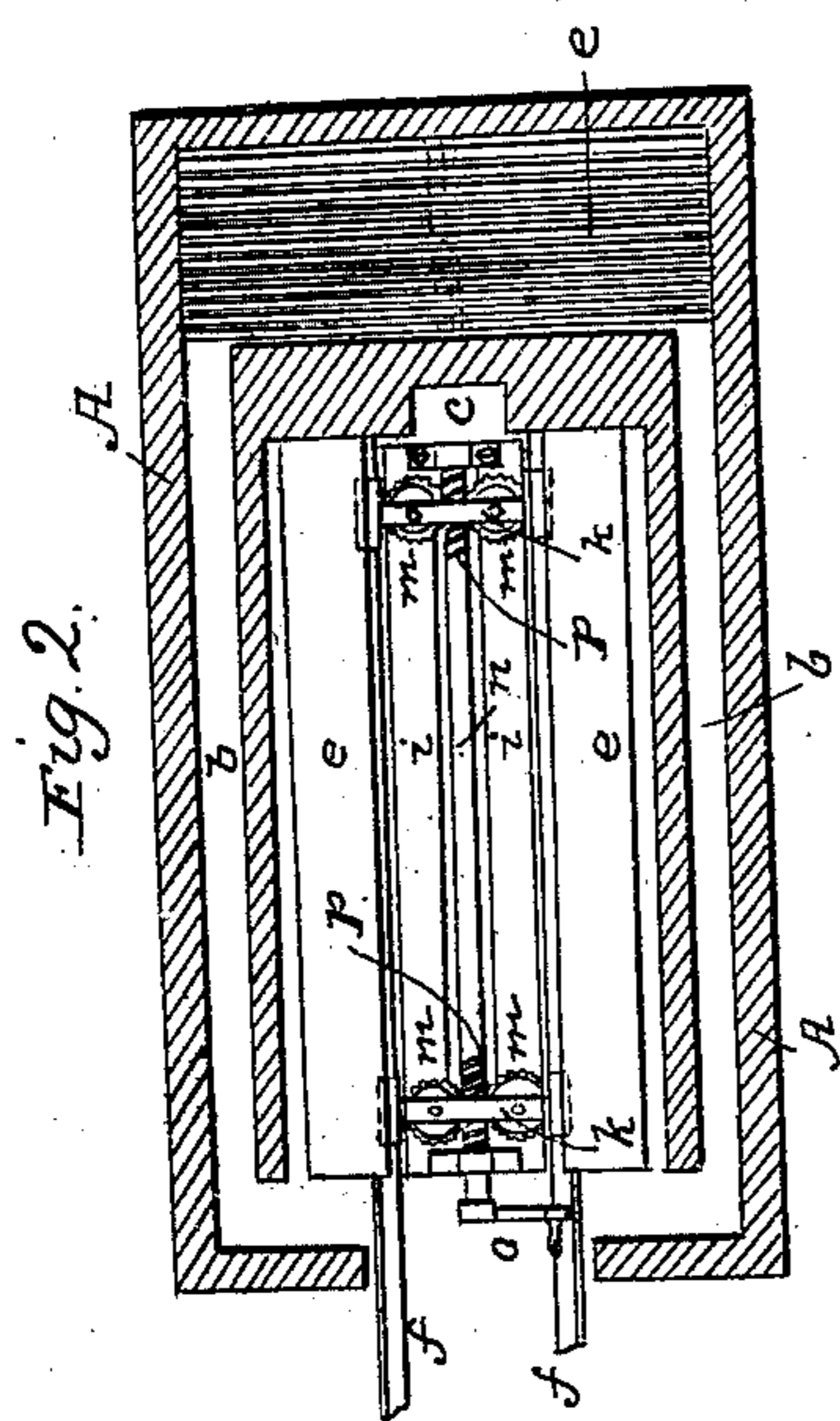


J. WORCESTER.  
Annealing Apparatus.

No. 30,174.

Patented Sept. 25, 1860.



Witnesses:

*Albion*  
*Geo. Brown*

Inventor:

*Joseph Worcester*

# UNITED STATES PATENT OFFICE.

JOSEPH WORCESTER, OF NEWPORT, KENTUCKY.

## ANNEALING APPARATUS.

Specification of Letters Patent No. 30,174, dated September 25, 1860.

To all whom it may concern:

Be it known that I, JOSEPH WORCESTER, of Newport, Campbell county, and State of Kentucky, have invented certain new and useful Improvements in the Apparatus for Annealing Iron, Steel, or other Kindred Metals; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and letters of reference marked thereon, which drawings and letters form part of this specification.

My invention relates primarily to the apparatus used for annealing sheet iron in large quantities; but is not restricted thereto. On the contrary it may be applied to the annealing of large quantities of iron, steel, or other metals. Hitherto it has been, and at present is customary in annealing sheet-iron to have the bed plate of the annealing box constructed with small wheels or rollers on the the under side, by means of which, in connection with rails, or a tramway, the box, together with its contents, weighing several tons is run into the annealing furnace. In this way the whole weight of the annealing box and its contents rests upon a few points, varying in number with the number of wheels or rollers attached to the bed plate. The consequence of this interrupted and partial method of supporting the weight is that any inequality in the heating of the bed plate, which is scarcely avoidable by any amount of care, leads to the frequent fracture and destruction of the same, and to much resulting extra labor in removing the box and its contents from the furnace; to the great loss of the manufacturer.

Now my invention consists of a peculiar construction of annealing furnace, in combination with a carriage or truck, of peculiar, but not novel construction whereby the annealing box when charged may be run into the annealing furnace, and easily, expeditiously and safely placed upon a continuous and adequate support, and when the process of annealing has been completed, may be removed from the furnace, in an equally easy expeditious and safe manner.

In order that others skilled in such matters may be able to understand and construct or use my invention, I shall proceed to describe it in detail.

In the accompanying drawings, Figure 1, is a perspective view of the annealing fur-

nace, having the front end removed, showing the annealing box *in situ* and the carriage used for conveying it to its resting place partially drawn out previous to closing up the furnace and applying heat. Fig. 2, is a horizontal section or plan of annealing furnace showing the aforementioned carriage run in as far as it can go. Fig. 3, is a vertical longitudinal section of the same, showing the aforementioned annealing box supported on the carriage, and ready to be lowered to its resting place.

Like letters of reference designate like parts in all drawings.

A, is the annealing furnace, with the fire-box *a*, at the rear, and the flues *b*, *b*, at the sides, *c*, being the vent or chimney, opening out of the main chamber *d*, or furnace proper.

*e*, *e*, are two longitudinal dwarf or sleeper walls, constructed of suitable height and thickness, one at each side and running the entire length of the inner chamber *d*. These walls are perforated in their whole length for the better circulation of heat, and are corbeled out at top as shown in Fig. 1, for the purpose of increasing their width. They may be covered by slabs of stone, iron, or other convenient and suitable material.

*f*, *f*, are wrought-iron L-shaped rails forming a tram-way from any desirable part of the manufactory, to the annealing furnace, and running therein as far as the rear wall of inner chamber *d*.

B, is the cast iron annealing box; consisting of *g*, the bed plate, of ordinary construction, and *h*, the cover.

C, is a carriage constructed of metal, of the length of the inner chamber *d*, running in the L-shaped train rails *f*, for the purpose of conveying the annealing box and its contents to and from the annealing furnace. As this carriage in its construction is not new, and as a device of itself, forms no part of my invention, I shall only describe it in general terms, and so far as a knowledge of its construction is necessary to the proper understanding of my invention.

*i*, *i*, is the body of the carriage, and *j*, *j* are the wheels, which run in the tram rails before mentioned. At each end of the carriage is a transverse sleeper, or bed plate *k*, supported by two strong upright screws *l*, *l*. These screws each pass through the center of an obliquely toothed gear-wheel *m*, which is free to revolve in a proper bed or journal

box in the body of the carriage.  $n$ , is a longitudinal spindle revolving in suitable journal boxes at each end of the carriage, and turned by a winch  $o$ . This spindle has a screw thread  $p$ , formed on its surface at each end where it passes between the two obliquely toothed wheels  $m, m$ , at each end of the carriage, forming two endless screw gearings as shown. By turning the winch  $o$ , in one direction the wheels  $m, m$ , are rotated so as to elevate simultaneously and equally the upright screw  $l, l$ , and the transverse sleepers or bed plates  $k$ ; and by turning the winch in an opposite direction, the screws and sleepers are simultaneously and equally lowered.

Now when the bed plate  $g$ , of the annealing box B, is placed evenly and squarely on the carriage just described, the carriage being already on the tramway, and loaded with its freight of sheet-iron, or other matters to be annealed, and the cover  $h$ , is placed over all, it is ready to be drawn or pushed to the annealing furnace. Arrived there, if it is found that the altitude of the under side of the annealing box is less than that of the sleeper walls  $e$ , on which it is to rest, a few turns, more or less, of the winch  $o$ , in the proper direction, elevates it the required distance, and the carriage and box are wheeled entirely in to the inner chamber of the annealing furnace. Now, by turning the winch  $o$ , of the carriage, in an opposite direction, the annealing box and its contents are gradually lowered until the bed plate rests evenly and securely on the coping of the sleeper walls  $e, e$ ; a few turns

more clears the carriage entirely of the annealing box, and it is drawn out, leaving the latter to be shut up and subjected for 24 40 hours or more to the heat of the furnace. When the firing is completed and it is required to remove the charge, the carriage may be run in under the box as before, the winch turned until the bed plate rests on the 45 carriage, and is clear of the sleeper walls, and then drawn out to the required part of the manufactory.

As before intimated, the carriage herein described is not new, nor is it my invention, 50 and I do not claim it; moreover, any other carriage capable of elevating and lowering its load in a similar manner to this, by any device or machinery whatsoever, may be used without changing my invention. The 55 annealing furnace is not new, nor with the exception of the sleeper walls, do I claim it.

Having now described my invention, and shown wherein I have used old and well-known devices, I proceed to state my claim, 60 and what I wish by Letters Patent to secure is—

The dwarf sleeper walls  $e, e$ , in the annealing furnace A, affording a bed for the annealing box B, when used in connection 65 with the carriage C, or any similar carriage for raising or lowering its load; all substantially arranged as described, and for the purpose set forth.

JOSEPH WORCESTER.

Witnesses:

WM. CLOUGH,  
GEO. PEBURN.