(No Model.) 3 Sheets—Sheet 1.

J. GJERS.

APPARATUS FOR EQUALIZING THE TEMPERATURE OF STEEL INGOTS.

No. 291,044. Patented Jan. 1, 1884.

Fig 1

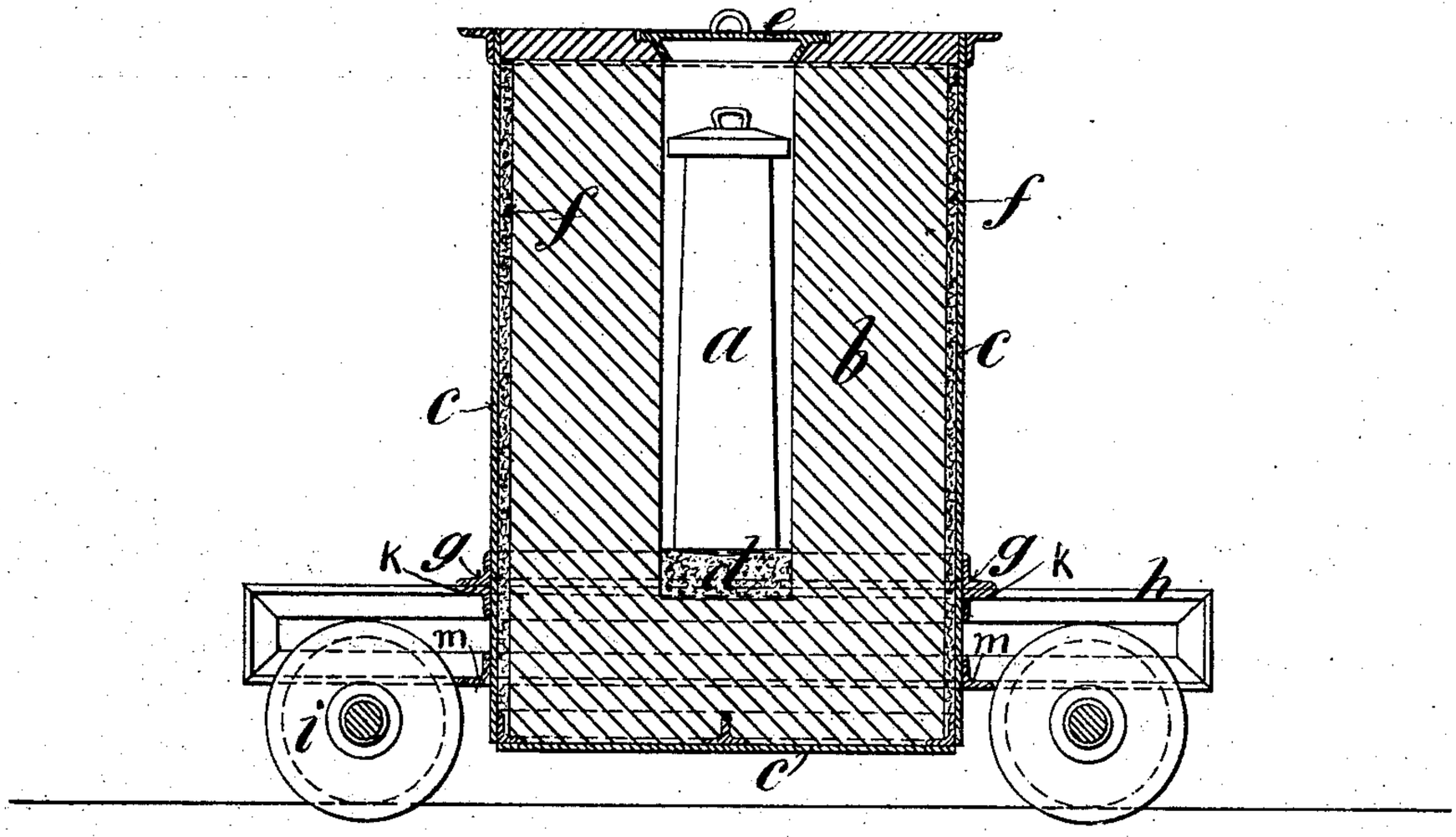
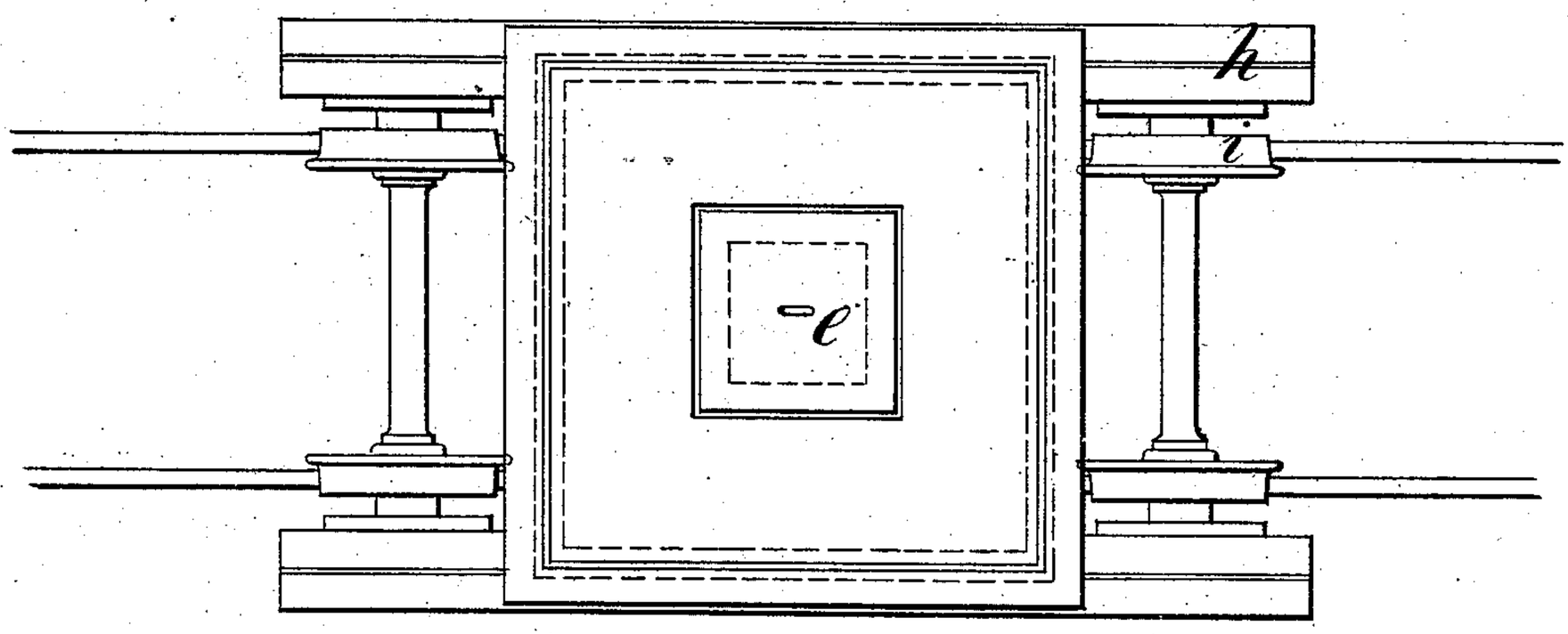


Fig 2



Witnesses;
E. W. Howard
J. Le Blackwood

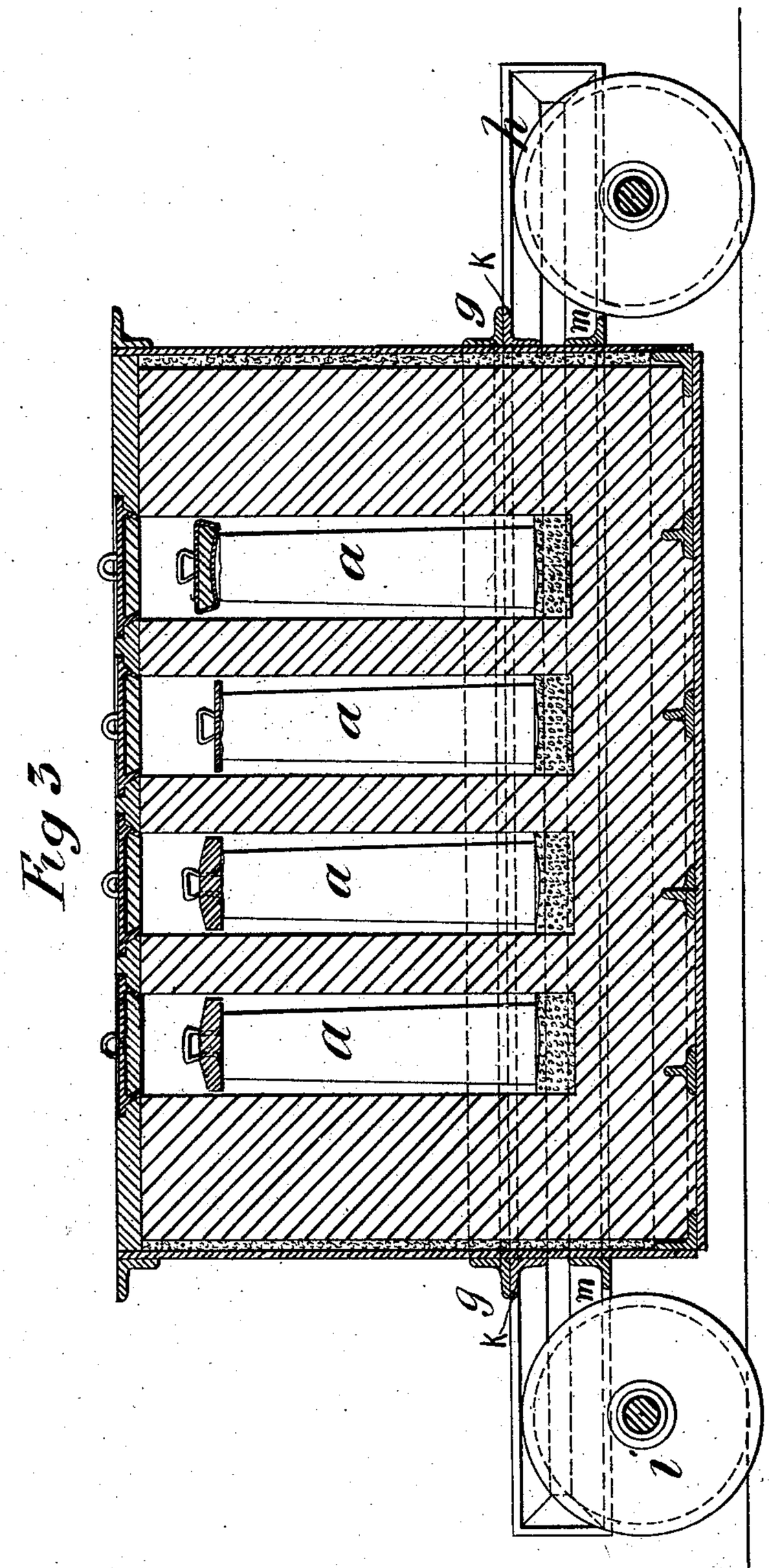
Inventor;
John Gjers
by P. A. Doolittle
Attorney

(No Model.) 3 Sheets—Sheet 2.

J. GJERS.

APPARATUS FOR EQUALIZING THE TEMPERATURE OF STEEL INGOTS.

No. 291,044. Patented Jan. 1, 1884.



Witnesses
Jos. Howard
J. McL. Blackwood

Inventor;
John Gjers
by M. L. Boolittle
Attorney

(No Model.)

3 Sheets—Sheet 3.

J. GJERS.

APPARATUS FOR EQUALIZING THE TEMPERATURE OF STEEL INGOTS.

No. 291,044. Patented Jan. 1, 1884.

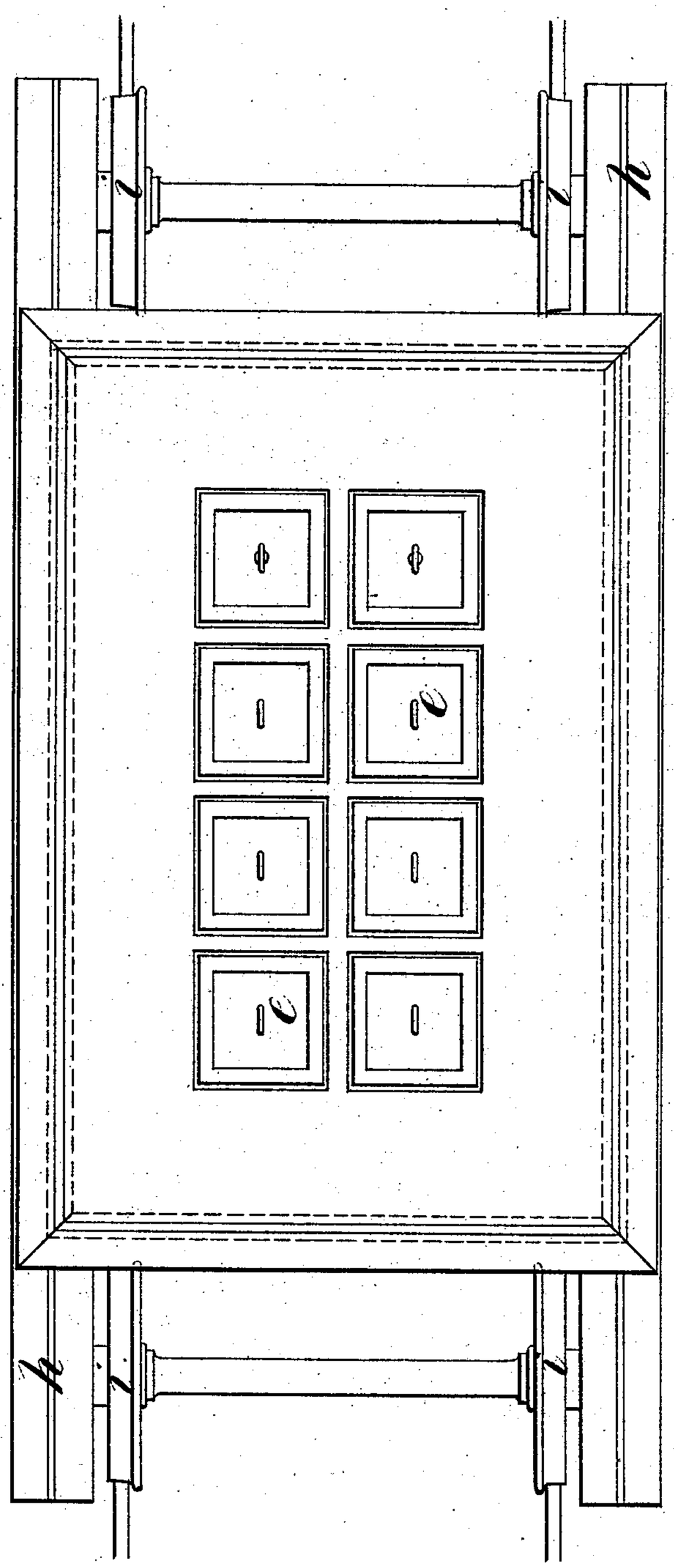


Fig 4.

Witnesses
H. F. Howard
J. H. Blackwood

Inventor;
John Gjers
by W. H. Doolittle
Attorney

UNITED STATES PATENT OFFICE.

JOHN GJERS, OF MIDDLESBROUGH, IN THE NORTH RIDING, COUNTY OF YORK, ENGLAND.

APPARATUS FOR EQUALIZING THE TEMPERATURE OF STEEL INGOTS.

SPECIFICATION forming part of Letters Patent No. 291,044, dated January 1, 1884.

Application filed March 23, 1883. (No model.) Patented in France May 8, 1882, No. 148,829; in Germany May 9, 1882, No. 21,716; in Belgium May 12, 1882, No. 57,891; in England July 26, 1882, No. 3,545, and in Luxemburg October 30, 1883, No. 317.

To all whom it may concern:

Be it known that I, JOHN GJERS, a subject of the Queen of Great Britain and Ireland, residing at Middlesbrough, in the North Riding of the county of York, Kingdom of Great Britain and Ireland, have invented new and useful Apparatus for Equalizing the Temperature of Steel Ingots, (for which, with other improvements, I have obtained a patent in Great Britain, No. 3,545, bearing date July 26, 1882,) of which the following is a specification.

In the specification of an application for Letters Patent of the United States filed by me the 18th day of April, 1882, is described and claimed a process of producing rolled or hammered steel without the use of a reheating-furnace, which consists in treating the ingots singly on their way from the casting-pit to the rolls or hammers by first carrying each ingot from the mold and inserting it in a vertical position in one of a series of stationary upright soaking-pits. These vertical pits, as described in my aforesaid specification, were built in a mass of brick-work or other refractory material of great and unusual thickness, each pit being separated from the others by a wall of refractory material, and each pit also provided with a separate cover of the same material as the said mass of brick-work or other non-conducting material, constituting an accumulator and reservoir for the heat radiated from the ingots.

Now, my present invention has for its object to enable soaking-pits of the kind in question—that is to say, built in a mass of brick-work or other refractory material of great and unusual thickness—to be used conveniently in cases where the rolling-mill is at a considerable distance from the casting-pit.

In the accompanying drawings, which illustrate my invention, Figure 1 is a sectional elevation of a portable soaking pit or cell constructed and mounted according to my invention. Fig. 2 is a plan view of the same. Fig. 3 is a sectional elevation of a modified apparatus, in which more than one soaking-pit is represented; and Fig. 4 is a plan view of the apparatus shown in Fig. 3.

The ingot *a* is placed in a vertical cell or pit formed in a mass of brick-work, *b*, or other suitable refractory material, which is inclosed at its sides and bottom within a strong metal box or casing, *c*. The cell in which the ingot is placed has a diameter only slightly greater than that of the ingot, so that as little space as possible is left at the sides of the ingot, and from this space the inclosed air is driven out by the gases arising from the heated ingots. The ingot rests on a bottom made of sand or some similar material which is a poor conductor of heat. The brick-work surrounding the ingot is of considerable extent, so as to permit but little of the heat from the ingot to escape during the equalizing process, as is fully set forth in my application above referred to. As the brick-work expands on becoming heated, a space, *f*, of suitable extent, is left between the sides of the brick-work and its surrounding casing *c*, which is filled with some loose material which is a bad conductor of heat. This material, besides allowing for the expansion of the brick-work, assists in preventing the radiation and escape of heat from the brick-work. A cover, *e*, practically air-tight, is used to cover the pit.

To render this equalizing apparatus portable, so that when the casting-pit and rolling-mill are a considerable distance apart the ingots may be transported at the same time that their temperature is being equalized, I mount it on a suitable truck. The axles of the wheels *i' i* of this truck support strong girders *h h*. Angle-pieces *g g*, entirely surrounding the metallic casing *c* and strengthening it, serve as means for mounting and supporting the equalizing apparatus. These angle-irons rest upon the girders *h h*, along the sides of the truck, and upon the cross-braces *k k*, extending between the girders *h h*. The cross-braces *m m*, also extending between the girders, besides strengthening the truck, serve also to prevent any lateral movement of the pit.

In the modification shown in Figs. 3 and 4 more than one vertical soaking-pit mounted on a single truck is used, and any number of pits may be so mounted, the only limit to the number depending on the portable feature of the apparatus.

The arrangement of the covers shown is similar to that described and claimed in my

application No. 58,689, filed April 18, 1882, and forms no part of my present invention.

I do not herein claim the process of equalizing the temperature of steel ingots, such being the subject-matter of the application herein referred to; nor do I claim other features herein shown which have been made the subjects of separate applications filed by me together with this application; but

What I do claim is—

1. A portable apparatus for equalizing the temperature of steel ingots, comprising a mass of brick-work or its equivalent, designed to act as an accumulator of heat, and having formed therein a vertical ingot-cell (or vertical ingot-cells) with cover, and a strong metal box or casing, *c*, mounted on wheels and inclosing said brick-work, the whole so constructed and arranged that ingots may be inserted and allowed to soak, (with exclusion of air,) so as to attain throughout a suitable temperature for rolling off successfully into blooms, or directly into a finished article, without reheating in a furnace, substantially as described.

2. In a portable apparatus for equalizing the temperature of steel ingots to enable them to be rolled into blooms or finished articles without recourse to a reheating-furnace, the combination of the mass of brick-work *b*, strong metal box or casing *c*, vertical chambers with sand bottoms *d* and covers, angle-pieces *g*, girders *h*, axles, and wheels *i*, all constructed, arranged, and operating substantially as described.

JOHN GJERS.

Witnesses:

JOHN WALLIN,
Accountant, Milton Street, Middlesbrough.

SANDERS R. TAWTON,
Accountant, Church Street, Middlesbrough.