

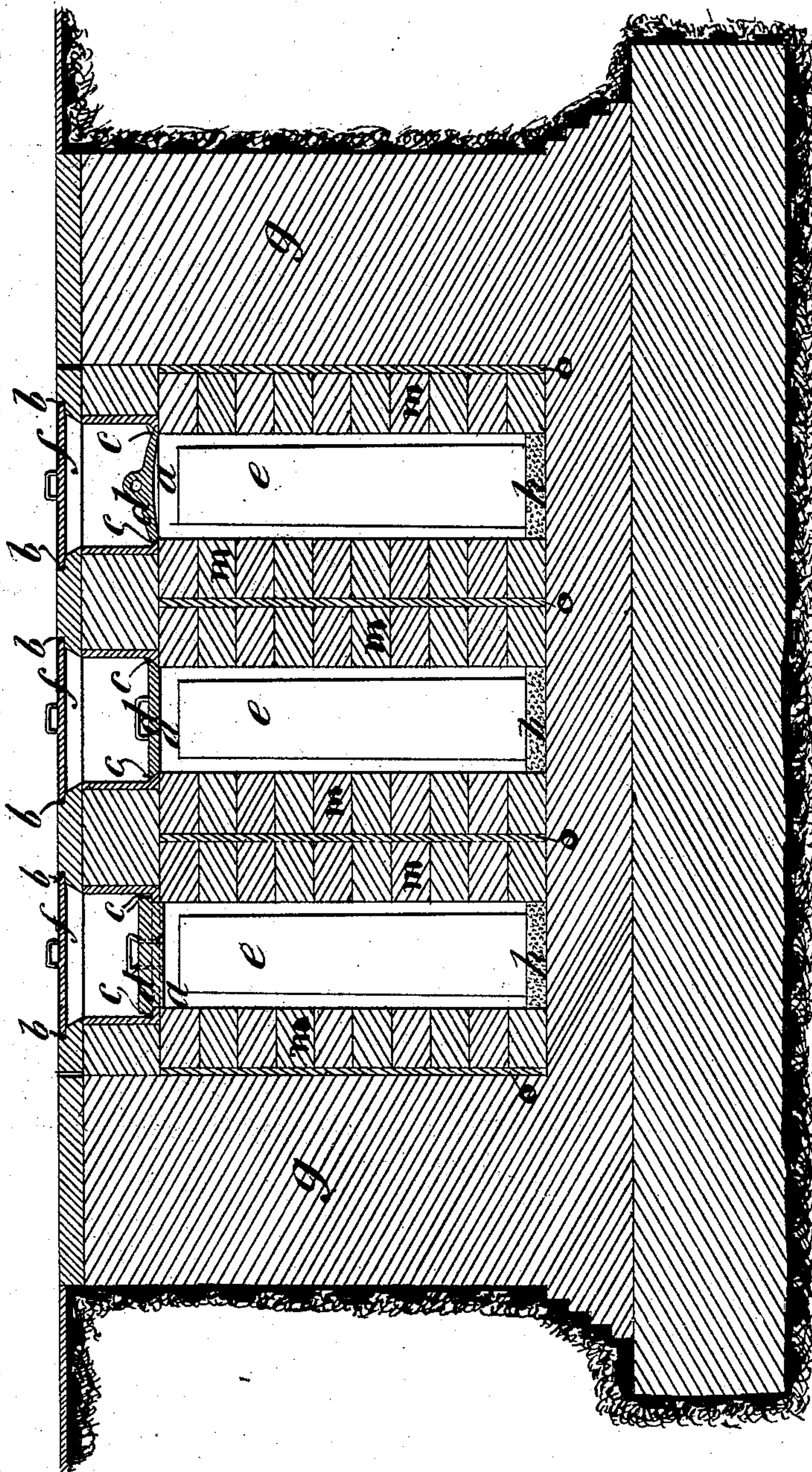
(No Model.)

J. GJERS.

APPARATUS FOR EQUALIZING THE TEMPERATURE OF STEEL INGOTS.

No. 291,046.

Patented Jan. 1, 1884.



Witnesses;  
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J. H. Blackwood

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# 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. 291,046, dated January 1, 1884.

Application filed March 23, 1883. (No model.) Patented in France May 8, 1882, No. 148,829; in Belgium May 12, 1882, No. 57,891; in England February 15, 1883, No. 847, 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, of which the following is a specification.

My invention relates to improvements in apparatus of the kind described in the specification of an application for Letters Patent of the United States filed by me on the 18th day of April, 1882. According to that invention steel ingots are converted into a finished or partly-finished state, without reheating them in a furnace, by the aid of vertical soaking-pits built in a mass of brick-work or other refractory material, and each of a cross-section slightly larger than that of the ingot and of a depth slightly greater than the length of the ingot. Each ingot immediately after being stripped from the mold is placed in one of these pits, and after the mouth of the pit has been closed by a cover or lid is there allowed to stand until its heat is distributed and it assumes a suitable temperature for being rolled or otherwise pressed into a bloom or finished article. According to that invention a portion of the heat of the ingot is communicated to the brick-work of the pit, and tends to maintain it at a temperature equal to that at which the ingot should leave the pit, so that should an ingot from any cause arrive at the pit short of heat, its temperature will be raised by heat from the walls of the pit itself, the refractory mass wherein the pit is formed acting as an accumulator of heat. Now, according to my present invention, in order to prevent access of external air to the interior of the pit, and thus to afford additional security against the liability of the top of the ingot in the pit to acquire a lower temperature than the rest, I construct the mouth of the pit so as to receive and support independently two covers—an inner one and an outer one. The inner cover is supported in a position somewhat above the level of the top of the ingot, and after an ingot has been taken out, while

the pit is waiting to receive another, the covers are replaced, and thus the inner one is kept hot and will not afterward have a cooling effect upon the top of the ingot. Also, by the above-described arrangement of two independently-supported covers, there is formed a top chamber that can be filled with material—such as sand or ashes—that will not readily conduct heat, thus assisting to maintain the interior of the pit at a high temperature, either during the cessation of work or at other times when found advisable.

The accompanying drawing represents in sectional elevation three vertical soaking-pits with double covers according to my present invention. It will be seen that the mouth of each pit *a* is constructed of an enlarged cross-section with two ledges, shoulders, or seats, *b* and *c*. The lower one, *c*, of which supports the inner cover, *d*, in a position slightly above the level of the top of the ingot *e*. The other ledge, shoulder, or seat, *b*, supports the outer cover, *f*, at the top of the mouth of the pit. The enlarged mouth of the pit may be lined with metal—such as cast iron—as shown, and the top covers may advantageously be of steel, and the lower covers of the same material or of brick or other suitable material.

*g* represents the mass of material—such as brick-work—in which the pits are formed, and *m m* the brick-work forming the walls of the pits. The walls of the several pits are separated by thick joints of fire-slag *o o*, which also separate the outer walls from the surrounding material *g g*. *h* represents the sand in the pit-bottoms, on which the ingots rest.

I do not herein claim the process of equalizing the temperature of steel ingots, that forming the subject-matter of a separate application filed by me April 18, 1882, No. 58,689, nor do I claim the arrangement of the covers described and claimed in said application; but

What I do claim is—

1. In a pit for equalizing the temperature of steel ingots, an enlarged mouth, in combination with a cover capable of being let down and supported in said mouth just above the level of the top of the ingot, whereby a chamber is formed above said cover, which can be



filled with some material that does not readily conduct heat, substantially as described.

2. In a pit for equalizing the temperature of steel ingots, an enlarged mouth, in combination with a lower cover capable of being let down and supported in said mouth just above the level of the top of the ingot, and an upper cover supported in said mouth above the lower cover, whereby a space is formed between said covers capable of being filled with some material that does not readily conduct heat, substantially as described.

3. In an apparatus for equalizing the temperature of steel ingots so as to enable them to be rolled into blooms or finished articles without treatment in a reheating-furnace, a mass of brick-work containing a series of vertical

pits, each constructed of a cross-section somewhat exceeding that of the ingots to be treated and of a depth somewhat greater than the length of the longest ingot the pit is designed to receive, and with an enlarged upper end or mouth with metal lining, two ledges, shoulders, or seats, *b c*, and two covers, *d f*, inclosing a space or chamber between them, all substantially as described and illustrated, for the purpose set forth.

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