

(No Model.)

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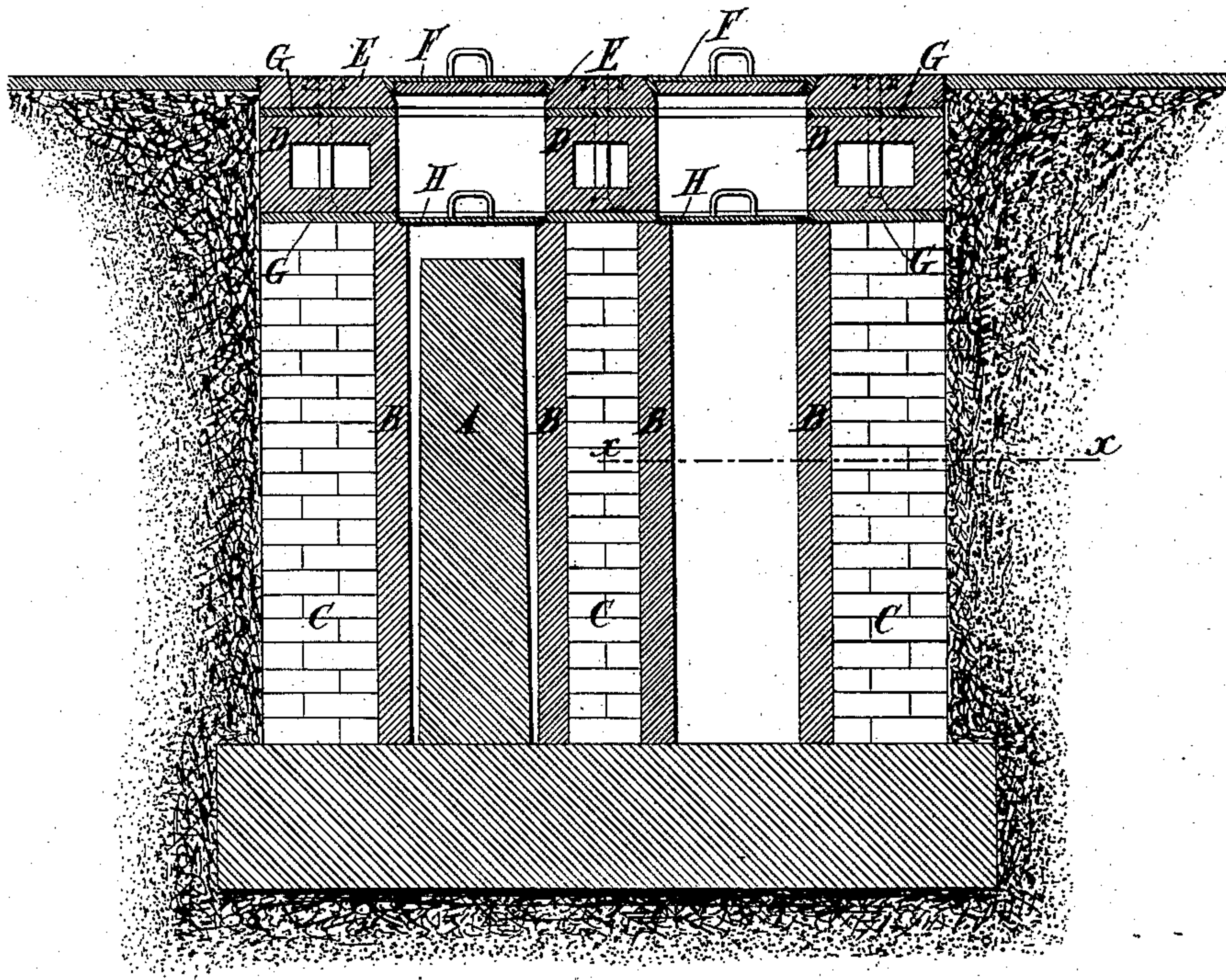
G. J. SNELUS.

APPARATUS FOR TREATING STEEL INGOTS.

No. 294,283.

Patented Feb. 26, 1884.

Fig. 1



Witnesses.

J. A. Rutherford
Robert Everett

Inventor,

George J. Snelus.

By

James L. Norrig.
Atty.

(No Model.)

2 Sheets—Sheet 2.

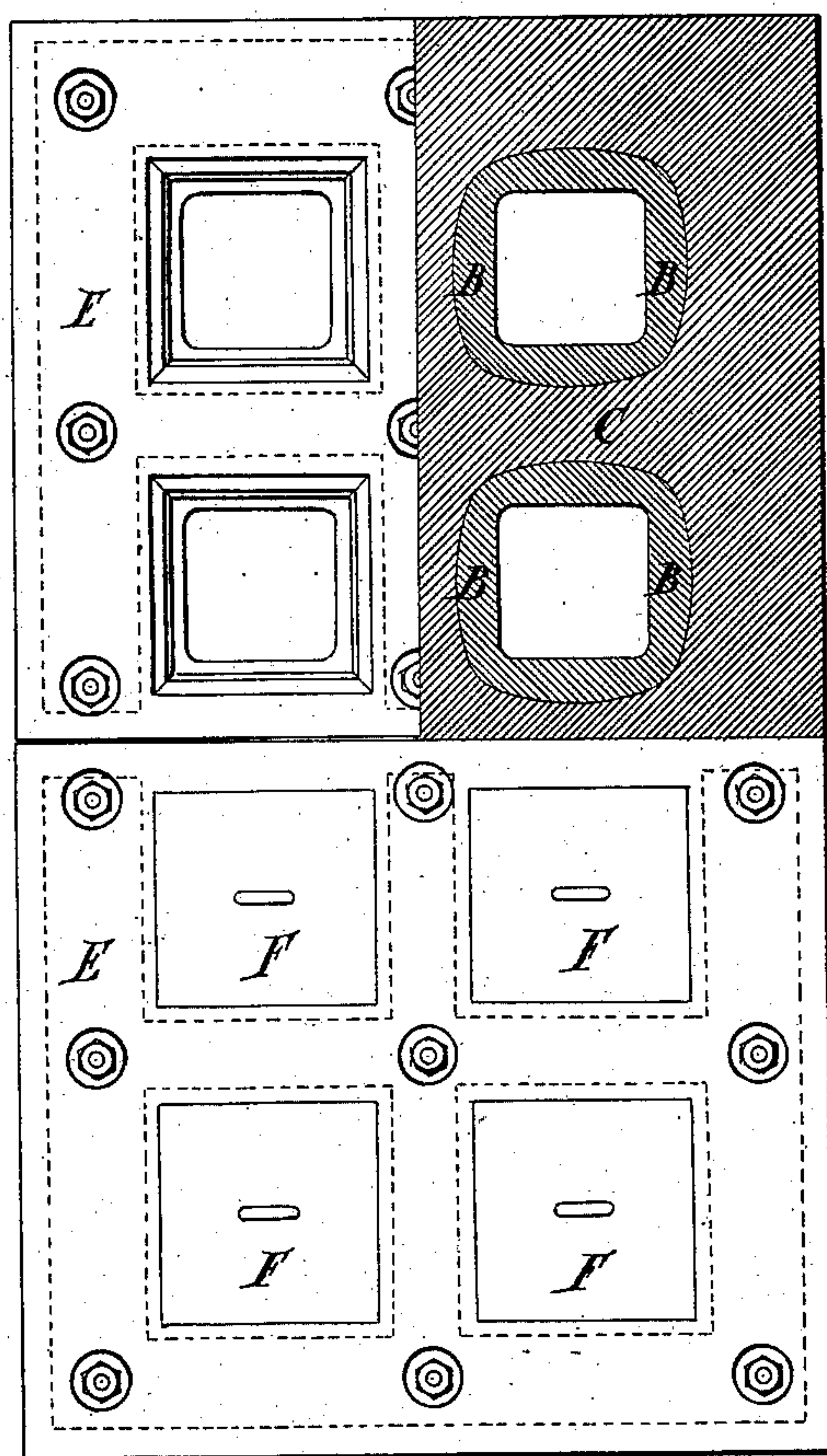
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Fig 2



Witnesses,

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Inventor,

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UNITED STATES PATENT OFFICE.

GEORGE JAMES SNELUS, OF WORKINGTON, ENGLAND.

APPARATUS FOR TREATING STEEL INGOTS.

SPECIFICATION forming part of Letters Patent No. 294,283, dated February 26, 1884.

Application filed October 8, 1883. (No model.) Patented in England February 22, 1883, No. 980.

To all whom it may concern:

Be it known that I, GEORGE JAMES SNELUS, of Workington, England, metallurgical engineer, have invented new and useful Improvements in Apparatus for Treating Steel Ingots, (for which I have obtained a patent in Great Britain, No. 980, bearing date February 22, 1883,) of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to apparatus for treating steel ingots, to facilitate the operation of rolling or otherwise working the same, and is designed to improve what are known as "Gjers' soaking-pits"—that is to say, chambers or pits sunk in the ground—into which chambers or pits the steel ingots are put as soon as they are removed from the molds. The surplus heat which the ingots then contain is communicated to the sides of these pits, so that the excessively hot central portion of the ingot cools, while the temperature of the outside thereof is raised, and the ingot is thus caused to attain a uniform or approximately uniform temperature throughout. The successive additions of surplus heat transferred from the hot ingot to the pit-sides render the latter so hot that they in turn will impart heat to an ingot if the same happens to be of lower temperature than usual. By these means the ingots are brought into a proper condition for rolling without the aid of any extraneous source of heat.

Heretofore the sides of these pits have been made of brick-work, and in using the said pits so constructed I have found that while the bottom of the pit becomes excessively hot, the top remains comparatively cool, and there is consequently some difficulty in keeping the top of the ingot as hot as the bottom thereof. Moreover, the brick sides of the pit are liable to be rapidly destroyed by the putting in and taking out of the heavy steel ingots. Now, I make the sides of the pit of steel, preferably in the form of a single rough casing made from ordinary Bessemer or Siemens steel low in carbon. The steel, being a better conductor of heat than brick-work, conducts the surplus heat from the bottom of the pit to the top thereof, and, having a high melting-point, the

said casing is not injured by the great heat in the pit. I usually employ a series of these steel casings, placed about nine inches apart, the spaces between the casings being filled up with brick-work, and the whole being then surrounded with two or more courses of brick-work connected by thin fire-clay joints. A heavy iron casting is then placed over these casings, leaving openings above the same slightly larger than those in the said casings. The openings in the said casings should be large enough to leave a space of about an inch wide around the thickest ends of the ingots to be treated. The top of the steel casing or lining serves as a rim upon which to place the inner lid or cover in order to inclose the ingot. A second iron casting with beveled edges is bolted to the top of the aforesaid iron casting to receive the outer covers, which may also be of cast-iron. Between the steel casings and the first iron casting and between the two iron castings I sometimes place layers consisting of a mixture of fire-clay and tar, about an inch thick, to form a non-conducting and close joint. The fire-clay should be dried, passed through a fine sieve, made red-hot, and then ground with the tar, to mix them thoroughly and form a very stiff mass.

In the accompanying drawings I have shown how the said invention may be conveniently and advantageously carried into practice.

Figure 1 is a vertical section of a series of soaking-pits constructed according to my said invention, the said section being taken through the center of two of the said pits. Fig. 2 is a plan of the same with some of the covers removed, two of the pits being shown in horizontal section on the line *x x*, Fig. 1.

A represents the steel ingot; B B, the steel linings or casings of the pits; C, the brick-work between and around the same; D, the lower heavy iron casting, which is cored out, as shown; E, the top iron casting, to receive the outer lids or covers, F; G G, the layers of fire-clay and tar, and H H the inner lids or covers resting upon the steel linings, which extend about twelve inches above the ingots.

In using these pits constructed according to my present invention I place a piece of clean coal—say about two cubic inches—in the

pit directly an ingot is removed. The gas volatilized from this coal serves to protect the steel lining and ingot from oxidation, and to slightly cool the bottom of the pit. Soaking-pits constructed in the manner herein specified last a very long time without any repair, and are more advantageous than those heretofore employed.

Having thus fully described my said invention and the manner of performing the same, I wish it understood that I do not claim, broadly, or irrespectively of the improvements herein set forth, a soaking-pit formed of brick-work, nor do I claim the treatment of steel ingots in the manner specified; but

What I claim is—

1. An apparatus for uniformly heating steel ingots, consisting, essentially, of a steel casing, B, sunk in the ground, a metallic frame secured over the upper end of the casing, and having an opening leading into the latter, an inner lid, H, for covering the upper open end of the casing, and an outer lid, F, for covering the opening in the metallic frame, substantially as described.

2. The combination of the steel casing B, sunk in the ground, the metallic frames D and E, arranged over each other above the casing, and each having an opening, bolts connecting the two frames, an inner lid, H, for covering the upper end of the casing, and an outer lid, F, for covering the opening in the upper metallic frame, E, substantially as described.

3. The combination of the steel casing B, sunk in the ground, the metallic frames D and E, bolted together above the casing, and each having an opening through it, non-conductors arranged, respectively, between the two frames and between the casing and the lower frame, and lids H and F, for covering the upper end of the casing and the opening in the upper frame, substantially as described.

4. The combination of a series of steel cas-

ings, B, inclosed by brick-work in the ground, a metallic frame secured over the casings, and having a series of openings—one for each of the latter—and lids H and F, for covering the upper ends of the casings and the openings in the metallic frame, substantially as described.

5. The combination of a series of steel casings sunk in the ground and surrounded by brick-work, metallic frames D and E, bolted together above the casings, and each having a series of openings leading to the casings, and lids H and F, for covering the upper ends of the casings and the openings in the metallic frames, substantially as described.

6. The combination of a series of steel casings sunk in the ground, the brick-work C, surrounding the casings, the metallic frames D and E, attached one upon the other above the casings, and each having a series of openings leading to the latter, non-conducting layers interposed between the two metallic frames and between the brick-work, the casings, and the under frame, D, and lids H and F, for covering the upper ends of the casings and the openings in the top frame, E, substantially as described.

7. A soaking-pit for uniformly heating steel ingots, having an upright lining of steel, in combination with the metallic frames D and E, united by bolts, and having openings leading to the pit, and lids H and F, for covering the top of the pit-lining and the opening in the top frame, E, substantially as described.

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

GEORGE JAMES SNELUS.

Witnesses:

JOHN ALBERT SALKDO,
Cashier, 5 Clifton Terrace, Workington.

HENRY WYNN,
Clerk, Workington.