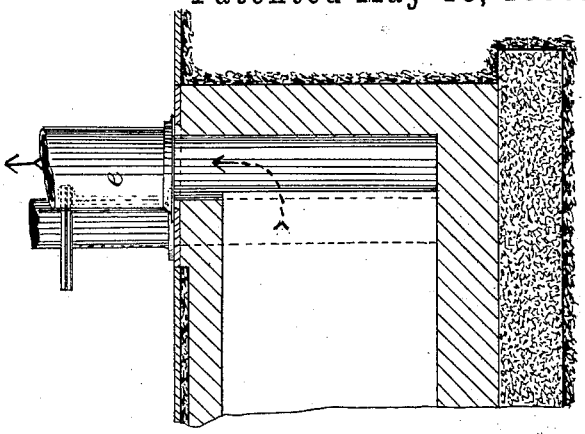
(No Model.) 3 Sheets—Sheet 1.

# J. GJERS.

## SOAKING PIT FOR STEEL INGOTS.

No. 342,251. Patented May 18, 1886.



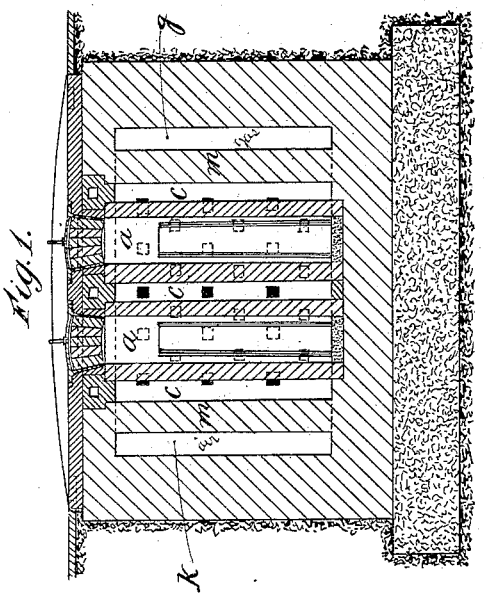


Fig. 1.

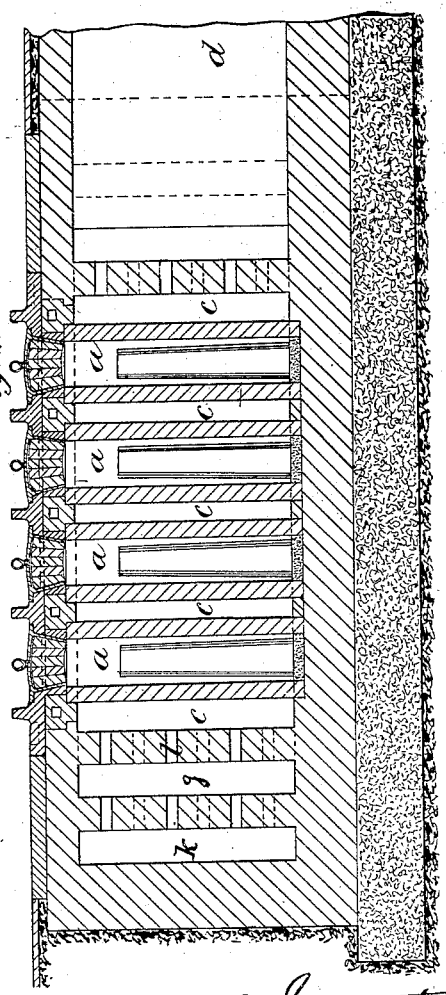


Fig. 2.

Witnesses:
Jos. H. Blackwood.
R. Dawes Bowers

Inventor:
John Gjers
by Wm. Dodge Littell
Attorney

(No Model.) 3 Sheets—Sheet 2.

# J. GJERS.

## SOAKING PIT FOR STEEL INGOTS.

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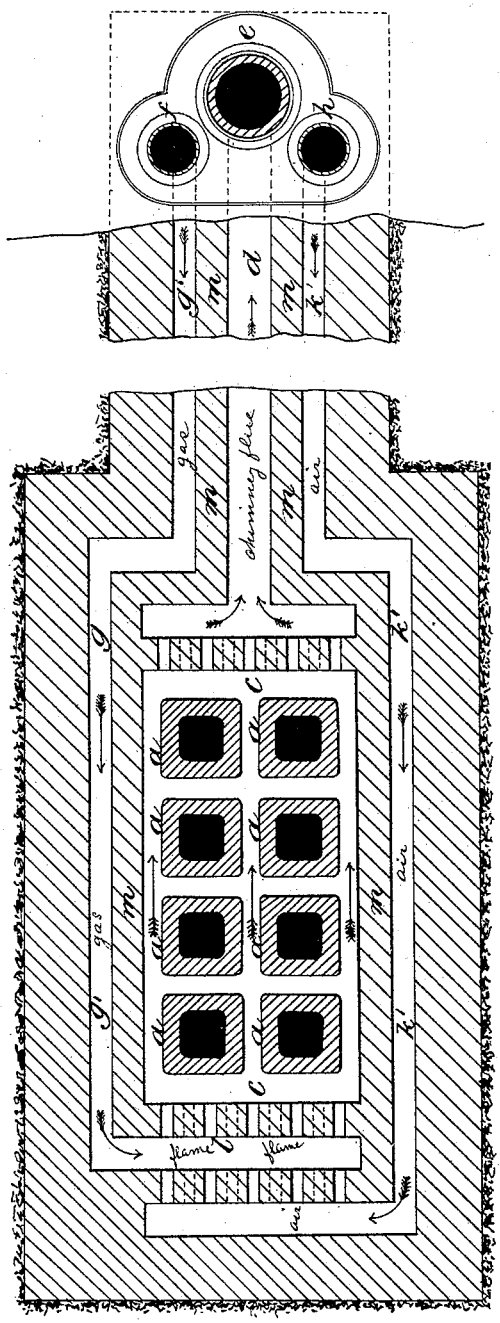


Fig. 3.

Witnesses;
Jos. H. Blackwood.
R. E. Dwyer

Inventor;
John Gjers
by M. M. Goodale Atty

(No Model.) 3 Sheets—Sheet 3.

# J. GJERS.

## SOAKING PIT FOR STEEL INGOTS.

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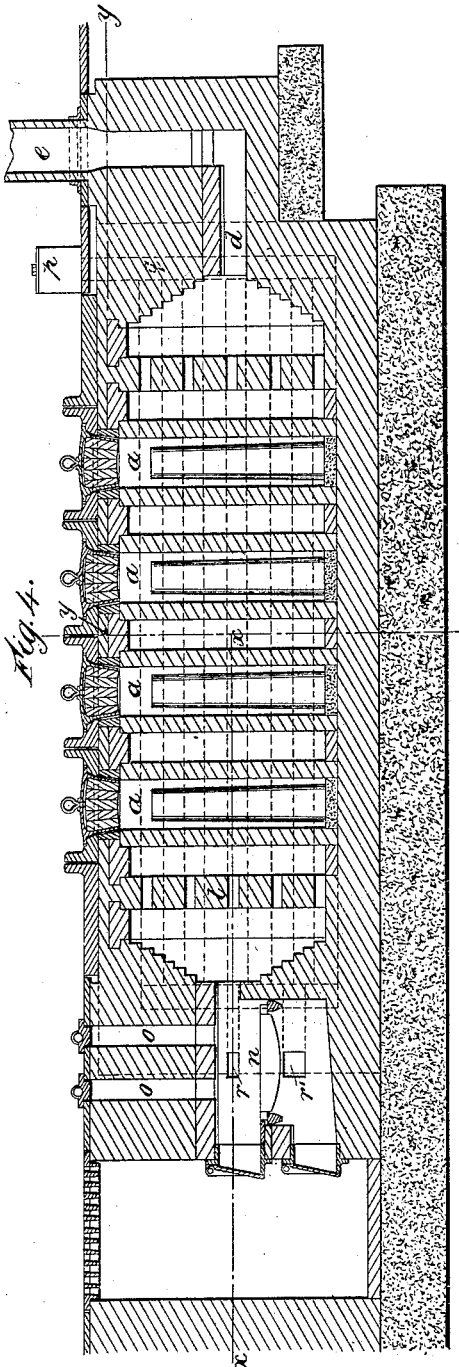

Fig. 4.

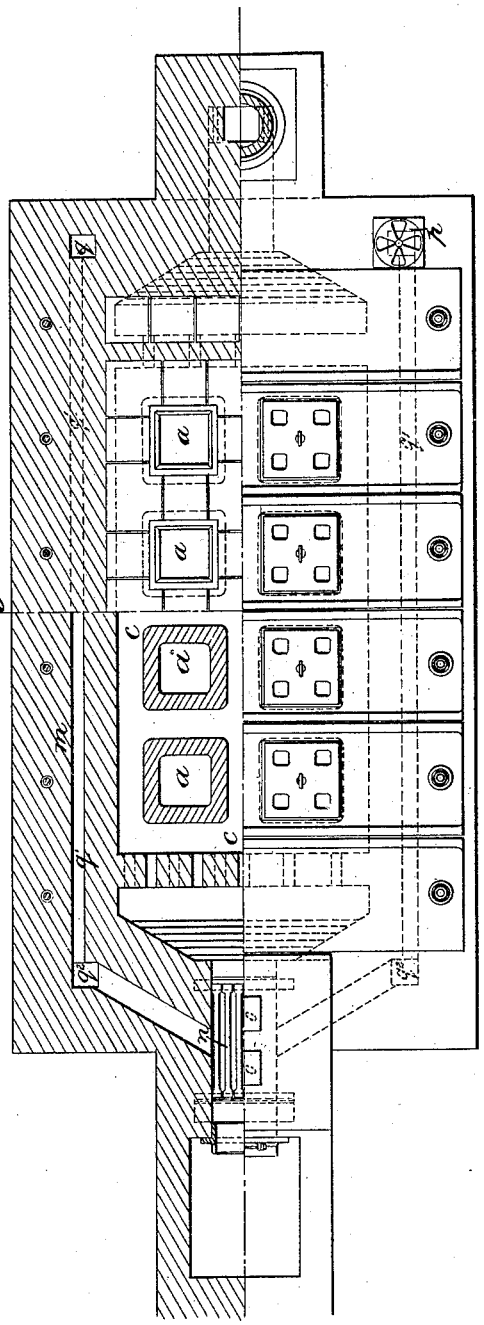

Fig. 5.

Witnesses;
Jos. H. Blackwood.
R. S. Dewey

Inventor
John Gjers
by W. H. Boulcate
Attorney.

# UNITED STATES PATENT OFFICE.

JOHN GJERS, OF MIDDLESBROUGH-ON-TEES, ENGLAND.

## SOAKING-PIT FOR STEEL INGOTS.

SPECIFICATION forming part of Letters Patent No. 342,251, dated May 18, 1886.

Application filed March 27, 1885. Serial No. 160,358. (No model.) Patented in Germany May 9, 1882, No. 21,716; in England February 20, 1885, No. 2,338; in France February 21, 1885, No. 167,216; in Belgium February 21, 1885, No. 67,968; in Sweden February 28, 1885, No. 85; in Luxemburg March 1, 1885, No. 505, and in Italy December 31, 1885, XXXVIII, 90.

*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-on-Tees, Kingdom of Great Britain and Ireland, have invented new and useful Improvements in Soaking-Pits for Steel Ingots, of which the following is a specification.

My present invention relates to a further development of the mode or process of treating steel ingots in soaking-pits, for which I obtained Letters Patent of the United States under date the 21st day of August, 1883, No. 283,735. As is well known, the invention forming the subject of that patent is usually carried out in practice in the following manner: The ingot as soon as it is stripped is with the least possible delay placed upright within a previously-heated upright soaking-pit, which is constructed of a cross-section only slightly larger than that of the ingot, and of a depth deeper than the length of the ingot, and then this soaking-pit is immediately covered over with a cover or lid, such as will practically exclude the air. In this pit thus covered the ingot is allowed to stand and "soak" (as I call it) until it assumes throughout a suitable temperature for being rolled or otherwise pressed into a bloom or other shaped article. An experienced workman, as is well known, can judge from the appearance of the ingot when it is in a fit state to be rolled. When starting, the cold pit is first subjected to a preliminary heating, which is usually effected by introducing into the pit in the first instance hot ingots, which, after imparting the requisite heat, are withdrawn and require to be reheated before they are rolled. It has been found that the operation as just above described is perfectly successful if the works have been adapted from the beginning for such treatment, and if charges of recently-cast ingots pass through the soaking-pits with sufficient regularity and rapidity; but in works where the casting of the ingots takes place at some distance from the rolling-mill, or where the ingots produced are either of very small size or are cast at long intervals, it becomes somewhat difficult to preserve such a surplus of heat in the soaking-pit as is necessary for the attainment throughout the ingots of a sufficient temperature for rolling.

To supply additional heat to the walls of the soaking-pits, and also to insure the retention by them of the temperature to which they have been raised, so that they may always be hot enough to receive a new charge of ingots, an arrangement of apparatus has been described in the specification of an application for Letters Patent of the United States by James Riley, filed the same day as my present application. Other arrangements are also described in the specifications of two applications for Letters Patent of the United States by me, likewise filed the same day as my present application, Nos. 160,356 and 160,357.

Now, according to my present invention the soaking-pits are constructed in the form of vertical fire-clay retorts set in a combustion-chamber, as I will proceed to describe with reference to the drawings.

Figure 1 represents in transverse section, Fig. 2 in longitudinal section, and Fig. 3 in sectional plan, such an arrangement.

*a a* are the soaking-pits, in the form of vertical fire-clay retorts, set in a combustion-chamber, *c*, and the heating of the soaking-pits is effected only from the outside by means of the gases burning in the combustion-chamber *c*. The products of combustion pass away through the flue *d* to the chimney *e*. The gas enters by the valve *f* and passes along the flue *g*. The air enters by the valve *h* and passes along the flue *k*, both uniting and burning through the openings in the brick-work at *l*. The gas and air in passing through these flues *g* and *k* take up the heat that passes through the brick-work *m*, so that the heat going away at the outside is always being brought back to the combustion-chamber *c*. Bricks may be built in at intervals across the gas-heating flue, as also across the air-heating flue, for the purpose of affording additional heating-surface, besides strengthening the walls of the flues.

It will be evident the arrangement can be adapted to work either with solid or liquid fuel, or with a producer of natural gas.

Fig. 4 is a vertical section illustrating the method of heating the soaking with solid fuel.

Fig. 5 is a plan or top view, partly in section, the section being taken partly on the line *x x* and partly on the line *y y*, Fig. 4, the tops of the soaking-pits in the latter section being removed. In this arrangement *n* is a closed fire-grate, to which fuel is supplied by vertical openings *o*, situated above the grate and closed at the top. Air to support combustion is admitted through air-valves *p* to vertical flues *q*, from which it passes along through flues *q'* in the brick-work *m* to other vertical flues, $q^2$, from which it passes to openings *r r'*, situate above and beneath the grate, respectively. The flame and heated products of combustion pass from the grate to the chamber *c*, where it heats the soaking-pits, and finally escapes to the chimney, as before. If natural gas or liquid fuel be employed, it is simply necessary to inject either of these substances through a hole in the fire-door and over the fire-grate.

What I claim is—

1. Apparatus for treating steel ingots to equalize their temperature before rolling, comprising a vertical soaking pit or pits constructed in a mass of brick-work in the form of vertical fire-clay retorts, in combination with a combustion-chamber, in which the retorts are set, and separate valves and separate flues to regulate the admission of air and gas to said chamber, openings in the brick-work where the gas and air unite, and a flue to carry away the products of combustion to a chimney, substantially as and for the purpose set forth.

2. The apparatus for treating steel ingots to equalize their temperature before rolling, comprising vertical soaking-pits *a*, constructed in the form of retorts, combustion-chamber *c*, valve *f*, flue *g*, valve *h*, flue *k*, and openings *l*, flue *d*, and chimney *e*, arranged and operating substantially as described.

JOHN GJERS.

Witnesses:

JAS. L. ADAMS,
52 *Hartington Road, Middlesbrough.*

JAMES B. DALES,
10 *Benson Street, Middlesbrough.*