

J. V. WOODHOUSE.
Lead-Furnaces.

No. 155,564.

Patented Sept. 29, 1874.

FIG. 2.

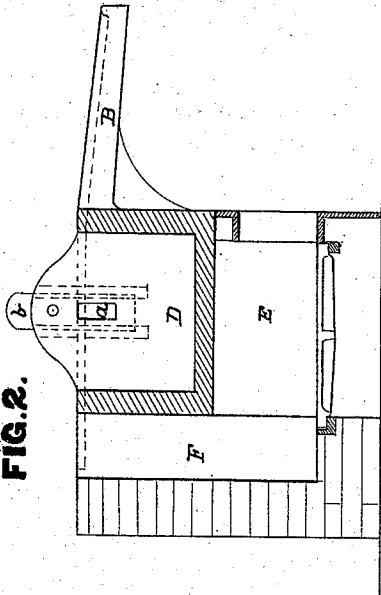


FIG. 1.

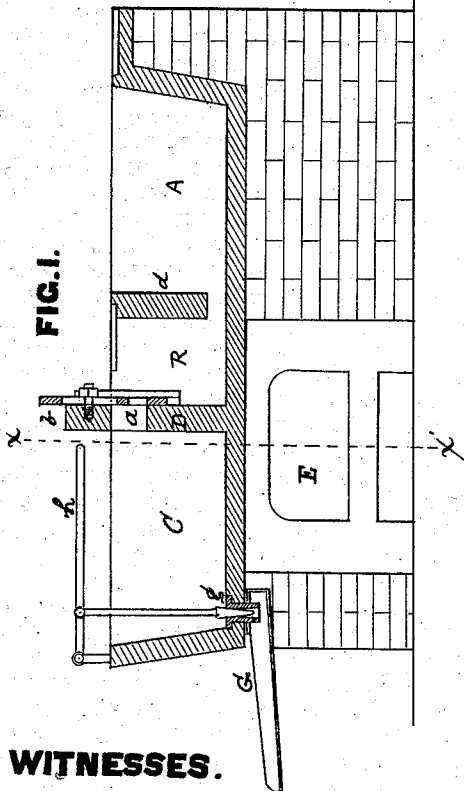
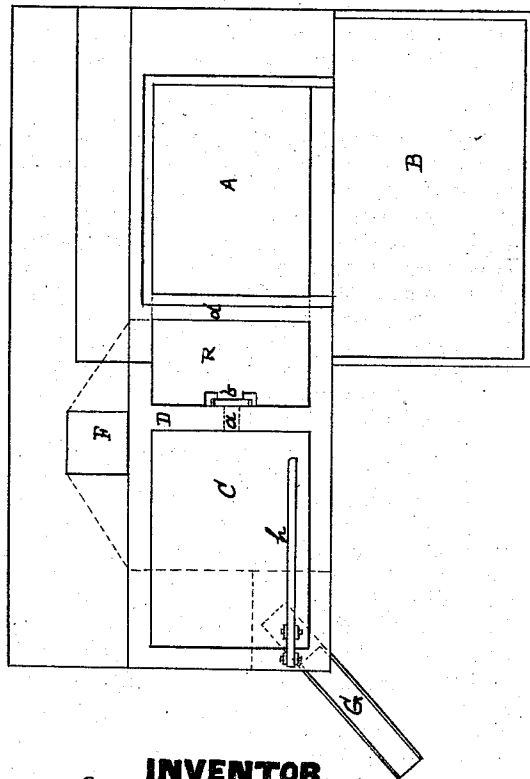


FIG. 3.



WITNESSES.

Sam'l. S. Boyd.
Daniel J. Potter.

INVENTOR.

John V. Woodhouse.
By Chas. D. Moody.
his atty.

UNITED STATES PATENT OFFICE.

JOHN V. WOODHOUSE, OF MINE LA MOTTE, ASSIGNOR OF ONE-THIRD HIS
RIGHT TO GERARD B. ALLEN & CO., OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN LEAD-FURNACES.

Specification forming part of Letters Patent No. **155,564**, dated September 29, 1874; application filed
July 23, 1874.

To all whom it may concern:

Be it known that I, JOHN V. WOODHOUSE, of Mine La Motte, county of Madison, State of Missouri, have invented a new and useful Improvement in Furnaces for Smelting Lead Ores, of which the following is a full, clear, and exact description, reference being had to the annexed drawing, making a part of this specification, in which—

Figure 1 represents a longitudinal section of my improvement. Fig. 2 represents a transverse sectional view of same at line *x x*, Fig. 1. Fig. 3 represents a top plan of Fig. 1.

Similar letters indicate like parts.

My improvement is applicable especially to the "Scotch hearth;" and consists in a construction and arrangement by which a purer and better quality of lead is produced at less expense than by the old method. This result is attained by reason of the complete control the smelter has over the heating of the ore, thus obviating all danger of burning and consequent waste, doing away with all necessity of reheating for the purpose of refining, and, in fact, making the whole process of smelting, from its inception to the final running into pigs, almost continuous and uninterrupted, and in a measure automatical.

A, Figs. 1, 3, represents the ordinary basin, with its apron B, the ordinary blocks to confine the stock and hold the tuyeres, and also the walls and chimney, being omitted, as their construction and arrangement are unchanged. This basin A is extended so as to form a receiving-basin, C, Figs. 1, 3, the partition D between them being provided with an opening, *a*, closed by a gate, *b*, having several perforations. In the basin A is a transverse partition, *d*, reaching nearly to the bottom, as seen clearly in Fig. 1, thus forming a sub-basin, R. Beneath the basin C, and extending partly under the sub-basin R, is a furnace, E, Figs. 1, 2, connected with the flue F, Figs. 2, 3, which opens into the main chimney or flue, (not shown,) which is used to carry off the fumes. In the bottom of the receiving-basin C, at one

corner, is a draw-off valve, *g*, operated by the lever *h*, or in any other desired manner, and connected with it is a trough, G, having a horizontal movement in the quadrant of a circle, so as to discharge its contents into the molds successively, the latter being, of course, arranged accordingly.

The operation of the furnace is as follows: The fuel and charge of metal or ore being placed in the main basin A, (none in the sub-basin R,) in the ordinary manner, the ore, as it melts, sinks to the bottom, floating the fuel and lighter dross on its surface, and the pure metal passes beneath the partition into the sub-basin R, rising up and filling it till, reaching an opening in the gate *b*, it escapes into the receiving-basin C, the point at which it is allowed to pass through the gate being regulated at pleasure, according as the ore is more or less refractory, in the former case the gate being adjusted to draw off the metal nearer the top of the basin than in the latter case, thus insuring a longer subjection to the heat. This is a point of great importance, since, if the ore is heated too much, it is injured, as was often the case under the old process, which imposed upon the smelter continuous and careful watching, to keep his "dam" higher or lower, so as to regulate the length of heating. By this arrangement, the gate being once adjusted to correspond to the refractory nature of the ore, the operation thenceforward, so far as this point is concerned, is quite automatic till the "tour" is completed. Having passed into the receiving-basin C, the ore is purified by "poling" in the usual manner, the impurities rising to the top, while the pure lead is drawn off, through the exit-valve, into the trough, and thence into the molds. The basin C and sub-basin R are both kept continually hot by a fire in the furnace beneath them, thus preserving the lead at a uniform temperature throughout the whole process, and allowing no cooling whatever.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the basin A, partition *d*, sub-basin R, and furnace E, as and for the purpose shown and specified.

2. The combination of the basin A, sub-basin R, partition *d*, opening *a*, gate *b*, receiving-basin C, and furnace E, as and for the purpose shown and specified.

3. The combination of the basin A, sub-basin R, partition *d*, opening *a*, gate *b*, receiving-basin C, valve *g*, and furnace E, as and for the purpose shown and specified.

4. The combination of the basin A, sub-basin R, partition *d*, opening *a*, gate *b*, receiving-basin C, valve *g*, furnace E, and spout G, as and for the purpose shown and specified.

JOHN V. WOODHOUSE.

Witnesses:

W. W. WATKINS,
JACOB H. LONG.