J. V. WOODHOUSE.

Blast-Furnaces.

No. 139,489. Patented June 3, 1873.

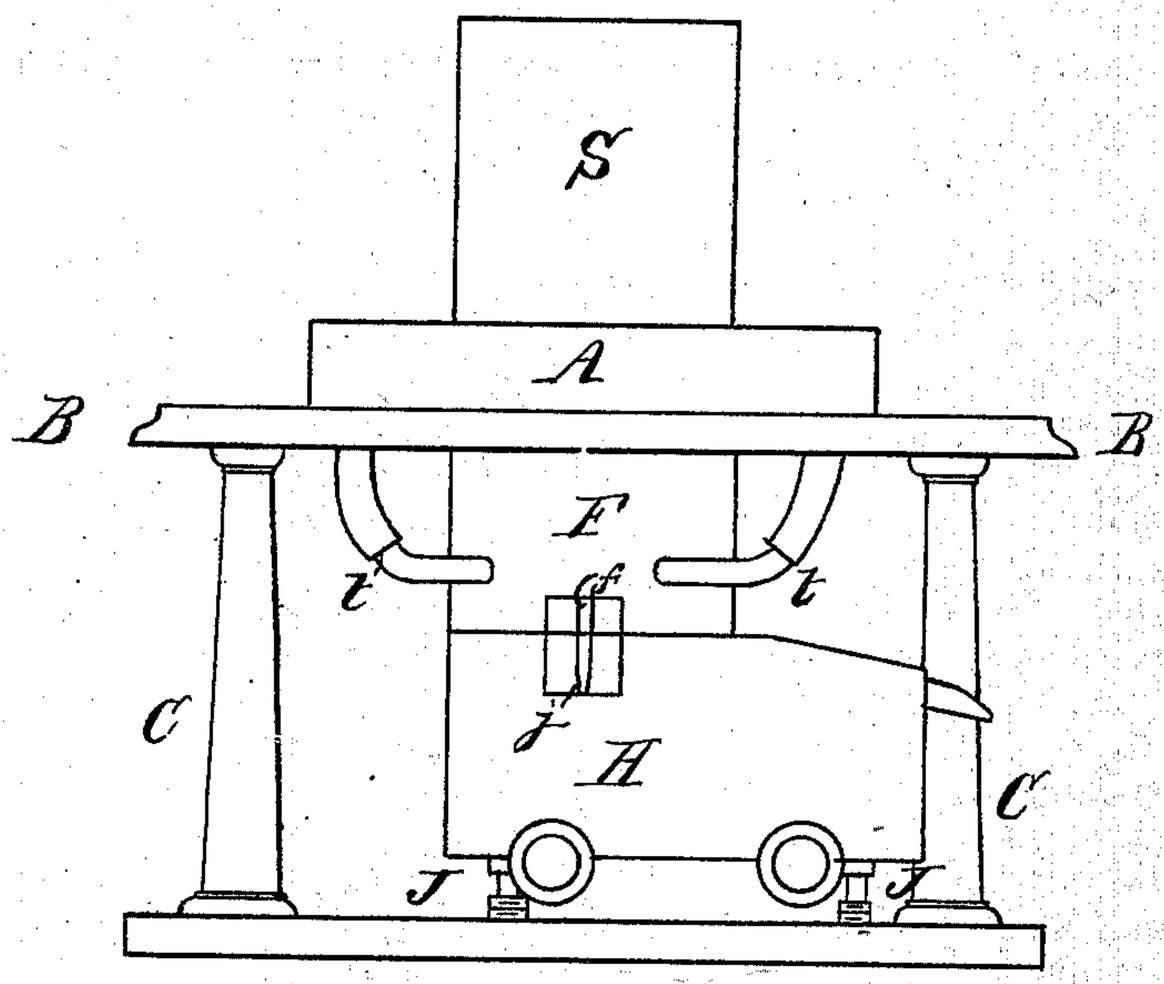

FIG. 1.

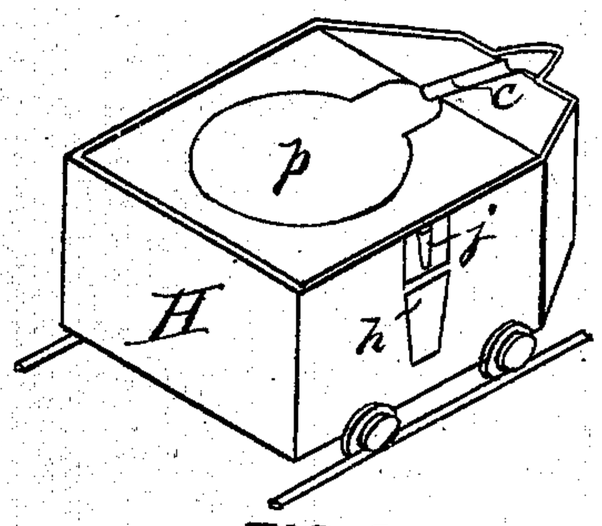

FIG. 2.

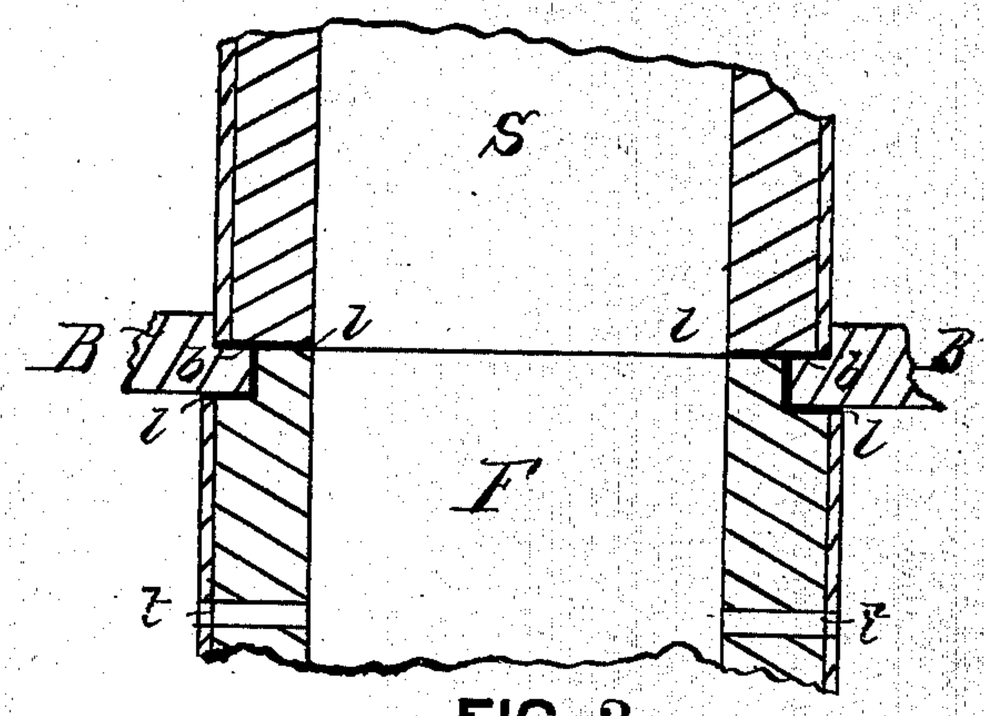

FIG. 3.

WITNESSES:

Chas Meisner.

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UNITED STATES PATENT OFFICE.

JOHN V. WOODHOUSE, OF MINE LA MOTTE, MISSOURI, ASSIGNOR TO HIMSELF, RADCLIFFE B. LOCKWOOD, AND WM. A. SCOTT, OF SAME PLACE.

IMPROVEMENT IN BLAST-FURNACES.

Specification forming part of Letters Patent No. **139,489**, dated June 3, 1873; application filed May 1, 1873.

To all whom it may concern:

Be it known that I, JOHN V. WOODHOUSE, of Mine La Motte, county of Madison and State of Missouri, have invented Improvements in Blast-Furnaces, of which the following is a specification:

It is well known that the ordinary blast-furnaces have their hearth or bottom forming part of the furnace; that in smelting copper, silver, nickel, and other metals, the lining of the furnace "burns out," and the furnace proper becomes oxidized and is rendered worthless. Also, that frequently the furnace is "chilled" by its tuyeres becoming choked or clogged by the action of the "slag;" and similarly the bottom or hearth is rendered inoperative from the slag, and great difficulties are experienced in removing the slag and otherwise readapting the furnace. Moreover, great expense and time and labor are incurred in laying a new hearth or supplanting the old hearth or bottom when the same becomes useless.

This invention has for its object the avoidance of the difficulties aforesaid by readily enabling smelters to get at the hearth, bottom, or floor inside of a cupola or stack furnace.

The nature of my invention, therefore, consists, first, in the formation of a detachable hearth or bottom; secondly, in forming the furnace proper or cupola or stack independent of the hearth; thirdly, in the combination of hearth, stack or cupola, and furnace; and, lastly, in certain detail construction of parts—all of which will now more fully appear.

To enable those skilled in the art to make and use my said improvements, I will now more fully describe the same, referring to—

Figure 1 as a side elevation; to Fig. 2 as a perspective view of detachable hearth; to Fig. 3 as an enlarged detail section, showing manner of connecting joint of furnace with its stack.

The drawing illustrates a "stack" furnace supported on columns, with air-chamber; tuyere-pipes as ordinary.

Therefore, C are the columns; B, the bed on columns to support the stack-furnace; A, the air-chamber on bed B to supply the blast. The stack and furnace I form in two parts or sections, so that the furnace can be removed from its stack; hence S is the stack; F, the furnace in which the ore is treated. The bed B I provide with an annular seat, *b*, Fig. 3, on which the stack rests. The furnace F has its top so formed as to project and fit within the annular opening of the bed B and abut against the bottom of the stack S when joined, (see Fig. 3.) The required joint for blast purposes is completed by placing fire-clay or other suitable lining material *l* between the joint of F and B, (see Fig. 3,) the object of thus forming the furnace F detachable from the stack S being to get at the parts when "chilling" occurs by the tuyeres being clogged, and to readily enable the furnace to be removed when the same becomes oxidized or is burnt out. *t* are the tuyere-pipes connecting from air-chamber A to furnace F to furnish blast to same. H, Figs. 1 and 2, is a detachable hearth, bottom, or floor, consisting of a sheet-iron carriage or case filled with earth, brick, lining, and the like. *p* is the basin or pot of hearth H to receive the reduced metal, which flows out of the usual tap-hole *h* at the side of the hearth. *c*, top of the hearth, is a channel for the discharge of the slag or extraneous matter. The hearth H is supported on wheels on a tram-way, Figs. 1 and 2, so as to be readily removed and replaced as occasion requires. The furnace F is placed or first supported on the hearth-carriage over its basin, and coupled by side pins *f* of furnace engaging the journals *j* attached to sides of hearth, Figs. 1 and 2. The hearth H with furnace F on top being brought in line under the stack, the required lift-movement for the parts to make their connection or joint is accomplished by means of ordinary jack-screws J, (see Fig. 1.) The jack-screws J are arranged to properly engage the bottom or under side of hearth H, and this (with furnace on top) is raised to the required height until the joint of furnace F is completed with its stack S, as indicated in Figs. 1 and 3. Thus the stack and furnace are continuously united, the connection of tuyere-pipes made,

the furnace and hearth properly supported, and the parts adapted for the process of smelting, which is done in the ordinary way.

As apparent, the hearth H, in case of necessity, can be lowered alone by supporting the furnace F in any proper manner, inserting bars through its tuyere-holes, and the hearth can be repaired, re-established, or otherwise rendered operative for the purposes intended.

In case the furnace becomes chilled or oxidized or rendered inoperative, it is lowered with hearth and the readaptation made.

Having thus fully described my said improvements, what I claim is—

1. A detachable hearth or bottom or floor, as and for the purposes set forth.

2. The cupola or stack independent of the hearth, as and for the purposes set forth.

3. The furnaces in which the reduction takes place, formed independent or detachable from its stack or cupola, as set forth.

4. The combination of a detachable hearth, H, furnace F, and stack S or cupola, as and for the purpose set forth.

In testimony of said invention I have hereunto set my hand.

J. V. WOODHOUSE.

Witnesses:
BEN. COLMAN,
C. M. SERVICE.