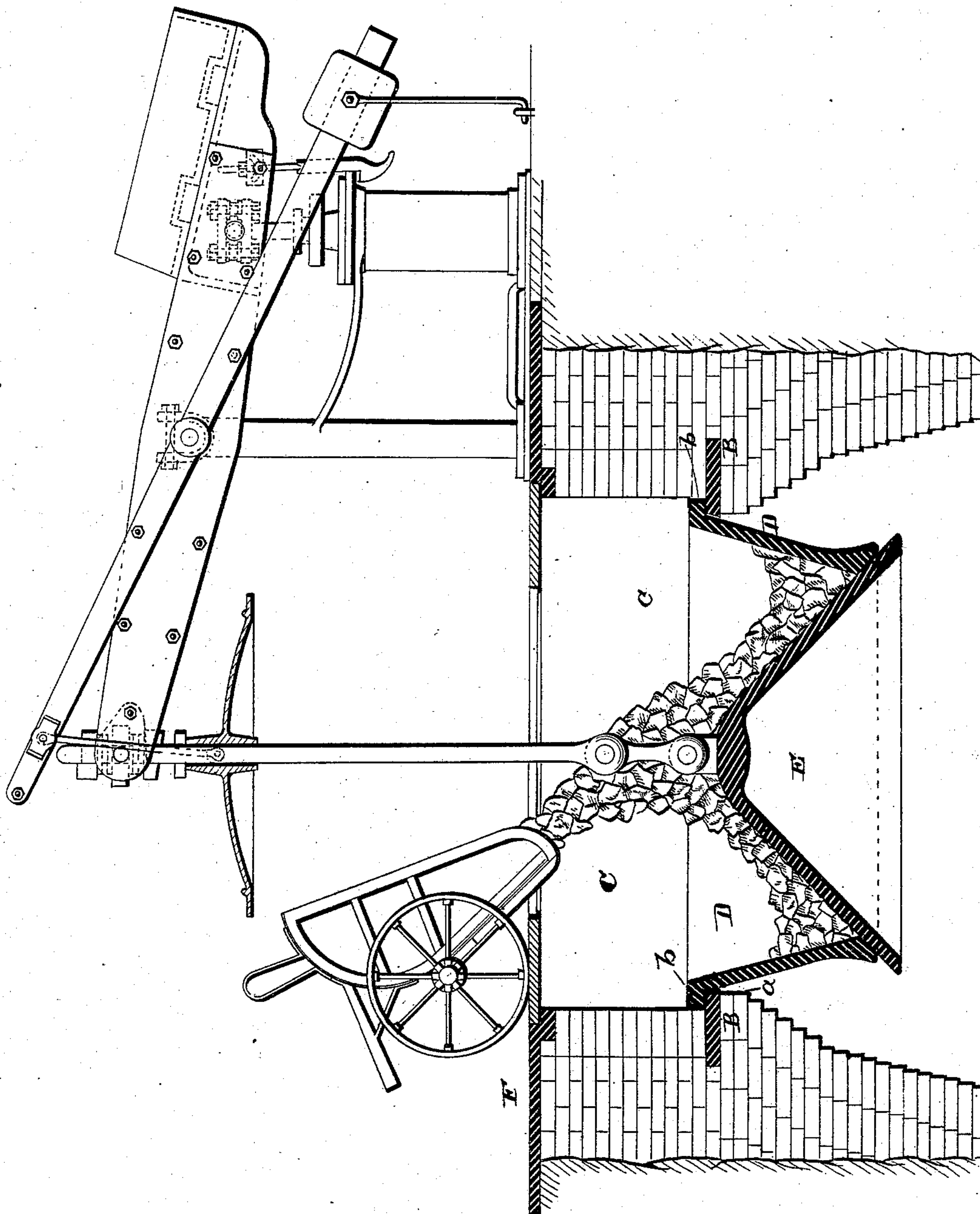


P. L. WEIMER.
Blast-Furnace.

No. 223,870.

Patented Jan. 27, 1880.



WITNESSES
E. Hottingham
G. W. Raymond

INVENTOR
P. L. Weimer.
By H. A. Seymour.
ATTORNEY

UNITED STATES PATENT OFFICE.

PETER L. WEIMER, OF LEBANON, PENNSYLVANIA.

BLAST-FURNACE.

SPECIFICATION forming part of Letters Patent No. 223,870, dated January 27, 1880.

Application filed November 1, 1879.

To all whom it may concern:

Be it known that I, PETER L. WEIMER, of Lebanon, in the county of Lebanon and State of Pennsylvania, have invented certain new and useful Improvements in Blast-Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawing, which forms part of this specification.

My invention relates to an improvement in blast-furnaces.

Heretofore the hoppers of blast-furnaces have been made of iron, the lower portion of the hopper having an inwardly-projecting flange formed thereon, upon which is seated an outwardly-projecting flange formed on the upper edge of the lip-ring. Iron hoppers have been found defective in use, for the reason that the continuous and intense heat of the furnace operates to crack and destroy them, and necessitates their removal and replacement by new hoppers. The destruction of the iron hoppers entails expense in maintaining the furnace in operative condition, while the removal of the old hoppers and the substitution of new ones also causes serious annoyances and trouble in addition to the expense.

The object of my invention is to obviate the expense and difficulties incident to the employment of iron hoppers in blast-furnaces, and to provide an improved construction of hopper which will withstand the heat of the furnace for a great length of time without requiring repair or renewal, and which may be repaired, when necessary, at slight expense and with little trouble and delay; and to this end my invention consists, first, in a blast-furnace, a hopper formed of masonry and a lip-ring located and suitably supported within the hopper at any desired distance below its upper end; second, in the combination, with a vertically-adjustable bell and a flaring lip-ring having its upper edge laterally flanged, of an inwardly-projecting seat-ring, which provides free bearing for said flange, and a hopper formed of masonry located on the seat-ring; third, in the combination, with a smelting-furnace the interior side of which is provided with an an-

nular projection, and a seat-ring supported on the latter, of a hopper formed of masonry, located upon the central portion of the seat-ring, a flaring lip-ring having a flange which bears on the exposed portion of the seat-ring, and an annular plate which covers the upper edge of the hopper.

The drawing represents the invention in a vertical sectional view.

The interior side of the furnace A is provided with an annular projection, *a*, which extends laterally inward or toward the vertical center of the furnace. Upon this projection is supported a seat-ring, B, having its outer edge flush with the edge of the projection.

The hopper C is formed of masonry, and rests upon the central portion of the seat-ring, the exposed portion of the latter providing a free bearing for the lateral flange *b*, formed on the upper edge of a flaring lip-ring, D. A vertically-adjustable bell, E, is adapted to bear against the lower edge of the lip-ring while the hopper is being charged, and when the bell is lowered there is ample passage for the charge between the bell and the furnace-side.

An annular plate, F, covers the upper edge of the hopper and protects the masonry therefrom from undue wear.

The hopper, being of masonry, is not liable to be affected by intense heat, as is the case with metal, the latter being apt to crack under such exposure.

The seat-ring is protected in great measure from the action of the fire by the inward projection of the furnace-side, on which it rests.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a blast-furnace, the combination of a hopper formed of masonry and a removable lip-ring having its outer edge supported on a ledge formed around the lower end of the hopper, substantially as set forth.

2. In a smelting-furnace, the combination, with a vertically-adjustable bell and a flaring lip-ring having its upper edge laterally flanged, of an inwardly-projecting seat-ring, which provides free bearing for said flange, and a hopper formed of masonry, located on the seat-ring, substantially as set forth.

3. The combination, with a smelting-fur-
nace the interior side of which is provided
with an annular projection, and a seat-ring
supported on the latter, of a hopper formed
5 of masonry, located upon the central portion
of the seat-ring, a flaring lip-ring having a
flange which bears on the exposed portion of
the seat-ring, and an annular plate which cov-
ers the upper edge of the hopper, substantially
10 as set forth.

In testimony that I claim the foregoing I
have hereunto set my hand this 25th day of
October, 1879.

PETER L. WEIMER.

Witnesses:

W. MORRIS WEIDMAN,
TOBIAS REINOEHL.