E. P. REICHHELM & C. F. KOESTER.

Crucible-Furnace.

No. 223,007. Patented Dec. 30, 1879.

Fig. 1

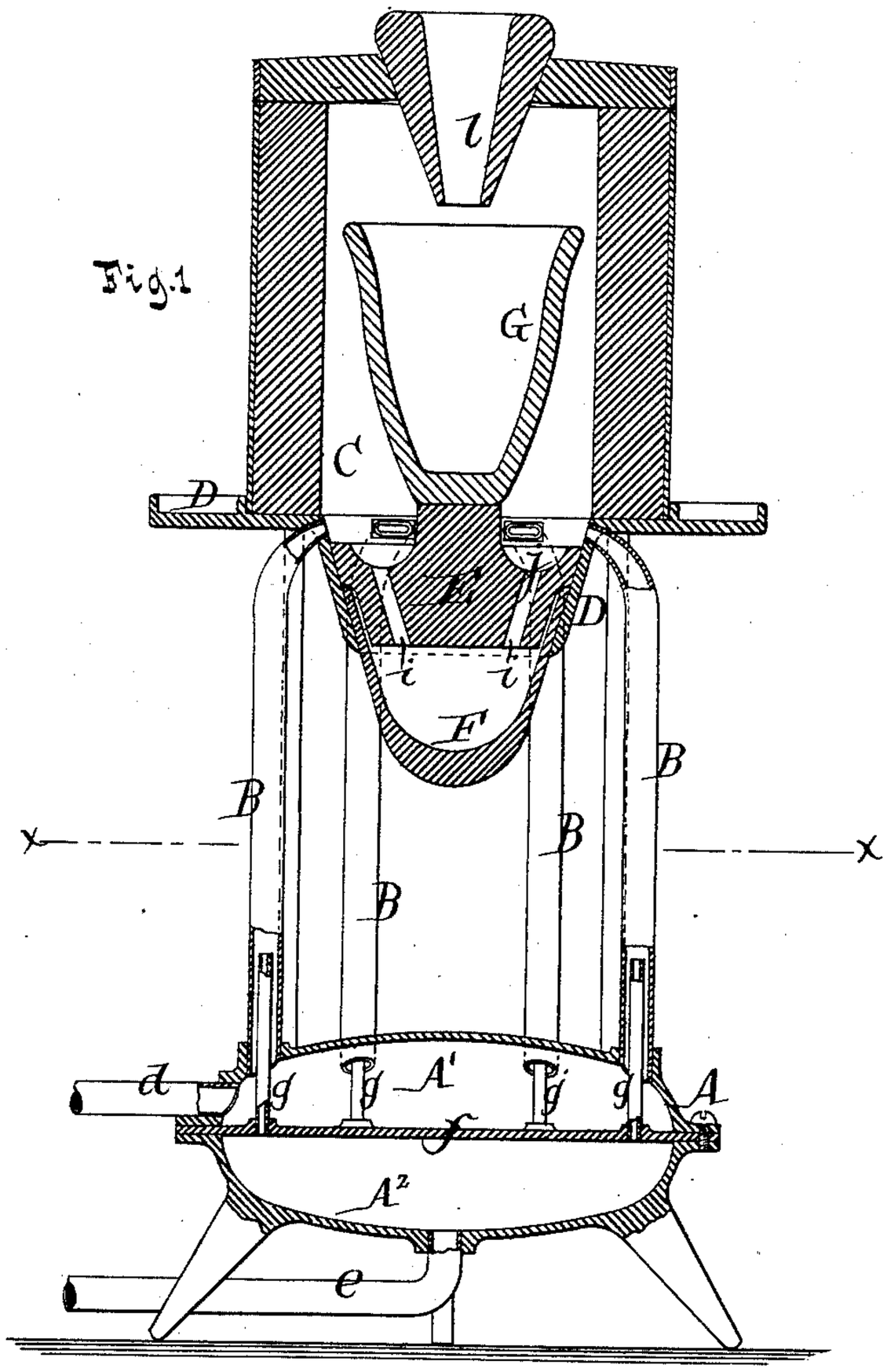
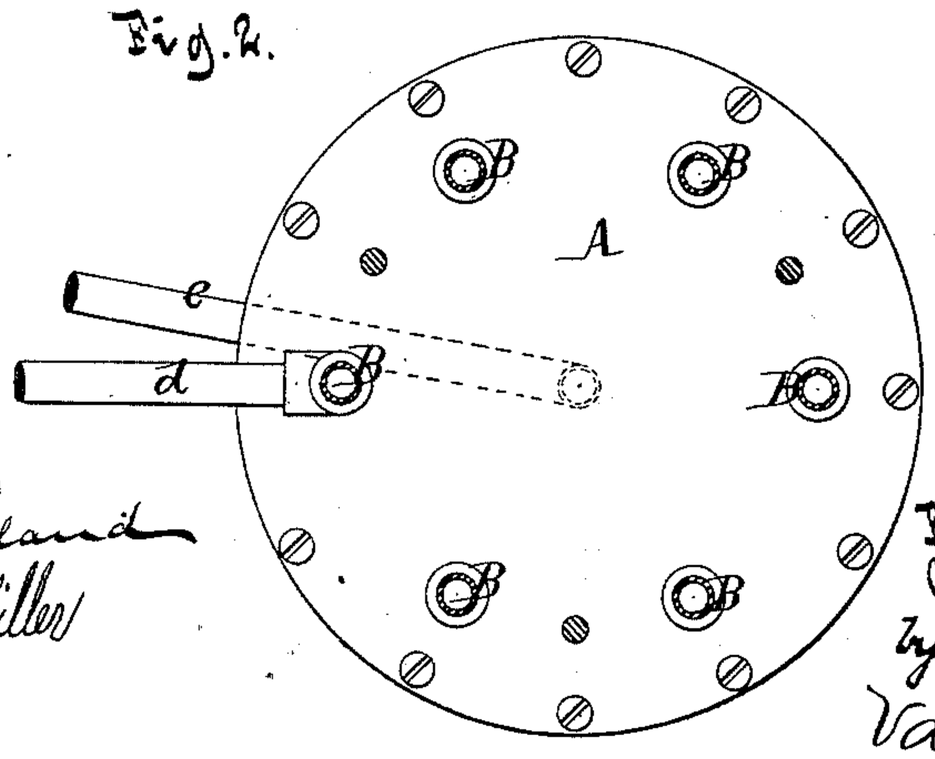


Fig. 2.



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UNITED STATES PATENT OFFICE.

EDWARD P. REICHHELM, OF JERSEY CITY HEIGHTS, AND CARL F. KOESTER, OF HOBOKEN, NEW JERSEY.

IMPROVEMENT IN CRUCIBLE-FURNACES.

Specification forming part of Letters Patent No. **223,007,** dated December 30, 1879; application filed May 7, 1879.

To all whom it may concern:

Be it known that we, EDWARD P. REICHHELM, of Jersey City Heights, in the county of Hudson and State of New Jersey, and CARL F. KOESTER, of Hoboken, New Jersey, have invented a new and useful Improvement in Crucible-Furnaces, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a vertical central section of a furnace embodying our invention. Fig. 2 is a horizontal section thereof in the plane of the line *x x*, Fig. 1.

Similar letters indicate corresponding parts.

Our invention relates to furnaces for heating crucibles of which the fuel is gas concentrated by a forced current of air; and it consists in a receiver adapted to connect with gas and air supply sources for distributing these agents and a series of burners rising from said chamber, so as to receive a supply of gas and air therefrom, combined with a heating-chamber, into which the burners project. The heating-chamber has a detachable perforated bottom, and beneath the same is arranged a detachable vessel, in order that if the crucible, situated in the heating-chamber, break, the molten metal is permitted to escape from the chamber.

In the drawings, the letter A designates the receiver; B, the burners, and C the heating-chamber. To the receiver A are connected two pipes, *d e*, one of which is intended to supply the same with gas, and the other to conduct thereto an impelled current of air, the gas and air being thence led to the burners. By the use of this receiver we insure an even distribution of the gas and air to the several burners. In this example of our invention the receiver A is divided, by means of a partition, *f*, into a gas-chamber, A′, and an air-chamber, A^2, and pipes *g* project from the latter into the burners B; but these features may, if desired, be omitted. The supply-pipes *d e*, moreover, may, if desired, be joined together at any suitable point, so that the gas and air enter the receiver at one and the same place.

The burners B are secured to the top of the receiver A, and are tapered at their upper ends, where they are to be ignited. At their upper ends the burners B, moreover, are bent inward, and are attached to a flanged inverted truncated cone, D, which supports the wall of the heating-chamber C, so that the gas issuing from the burners is projected into this heating-chamber, its course being upward and inward. The inverted cone D also supports the bottom of the heating-chamber (marked E) and a cup or vessel, F, this vessel being placed underneath the bottom, and both being by their arrangement rendered detachable. Said bottom E of the heating-chamber is suitably shaped to support a crucible, G, and in the same are formed a series of perforations, *i*, a groove or depression, *j*, being also preferably formed in the upper surface of the bottom, to connect the perforations.

If the crucible placed in the heating-chamber C is defective and breaks, the molten metal thus let free runs through the perforations *i* into the vessel F, from which it may be removed at any time, and hence the heating-chamber is not liable to be clogged or encumbered by the metal. The products of combustion escape from the heating-chamber C through an orifice, *l*, which also renders the interior of the chamber visible to the attendant.

If desired, the air-inlet pipe *e* may be connected to the bottom of the gas-chamber A′ at the center thereof, and the feed-pipes *g* arranged to diverge or radiate from the upper end of said air-inlet pipe, and in that case the air-chamber A^2 is dispensed with.

I am aware that a blast gas-burner has been constructed of a movable chamber divided into two compartments by a horizontal partition, and the upper side of the chamber being constructed with a series of apertures, through which extend a series of tubes projecting from the under side of the horizontal partition, the lower compartment formed by the partition communicating with an air-supply pipe, and the upper compartment communicating with a gas-supply pipe, whereby the air under pressure is forced through the said tubes and mixes

with the gas which passes through the apertures in the top of the chamber as the same issue from the burner, and such I hereby disclaim.

What we claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a receiver and distributer having openings to connect with gas and air supply sources, and a series of burner-tubes emanating from the receiver and distributer, of a vertically-arranged heating-chamber, with which the upper ends of the burner-tubes communicate, said heating-chamber serving to receive a crucible, and having a passage for the escape of the products of combustion, substantially as shown and described.

2. The combination, with the receiver or distributer having openings to connect with gas and air supply sources, and a series of burner-tubes emanating from the receiver or distributer, of a vertical heating-chamber, with which the upper ends of the burner-tubes communicate, the bottom of said heating-chamber having a series of vertical passages and a cup-shaped vessel suspended beneath the said bottom for receiving and holding the molten metal should the crucible break, substantially as and for the purpose described.

3. The combination of the receiver or distributer A, having openings to connect with gas and air supply sources, a series of burner-tubes, B, emanating from the receiver or distributer, and having tapering upper ends, the inverted cone D, through which said tapered ends of the burner pass, the vertical heating-chamber C, the detachable bottom E, having a series of vertical passages, *i*, and arranged below the upper ends of the burners, and the detachable cup-shaped vessel F, arranged below the said bottom, the bottom and vessel being arranged within and supported by the inverted cone, all substantially as shown and described.

In testimony that we claim the foregoing I, the said CARL F. KOESTER, have hereunto set my hand and seal on the 17th day of April, 1879, and I, the said EDWARD P. REICHHELM, have also set my hand and seal hereunto on the 2d day of May, 1879.

CARL F. KOESTER. [L. S.]
EDWARD P. REICHHELM. [L. S.]

Witnesses as to Carl F. Koester:
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Witnesses as to Edward P. Reichhelm:
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CHAS. WAHLERS.