2 Sheets--Sheet 1.

W. M. WATSON.

Furnaces for Tempering Castings, &c.

No. 143,548. Patented Oct. 7, 1873.

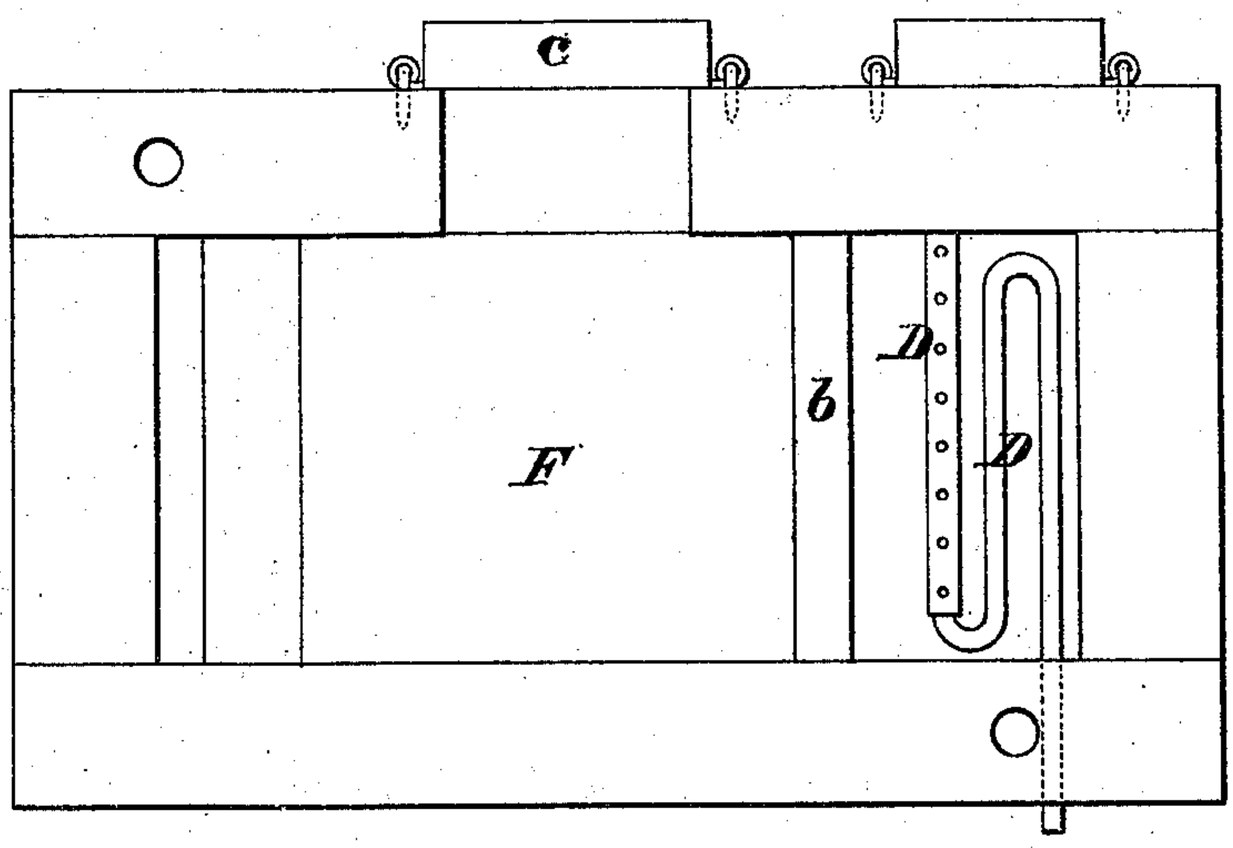

Fig. 1.

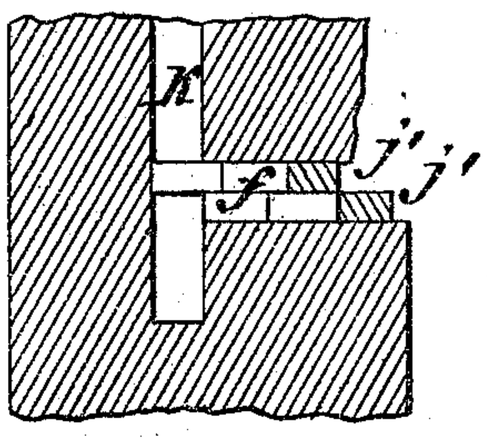

Fig. 4.

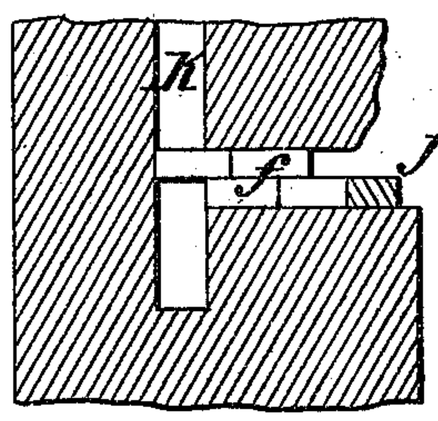

Fig. 5.

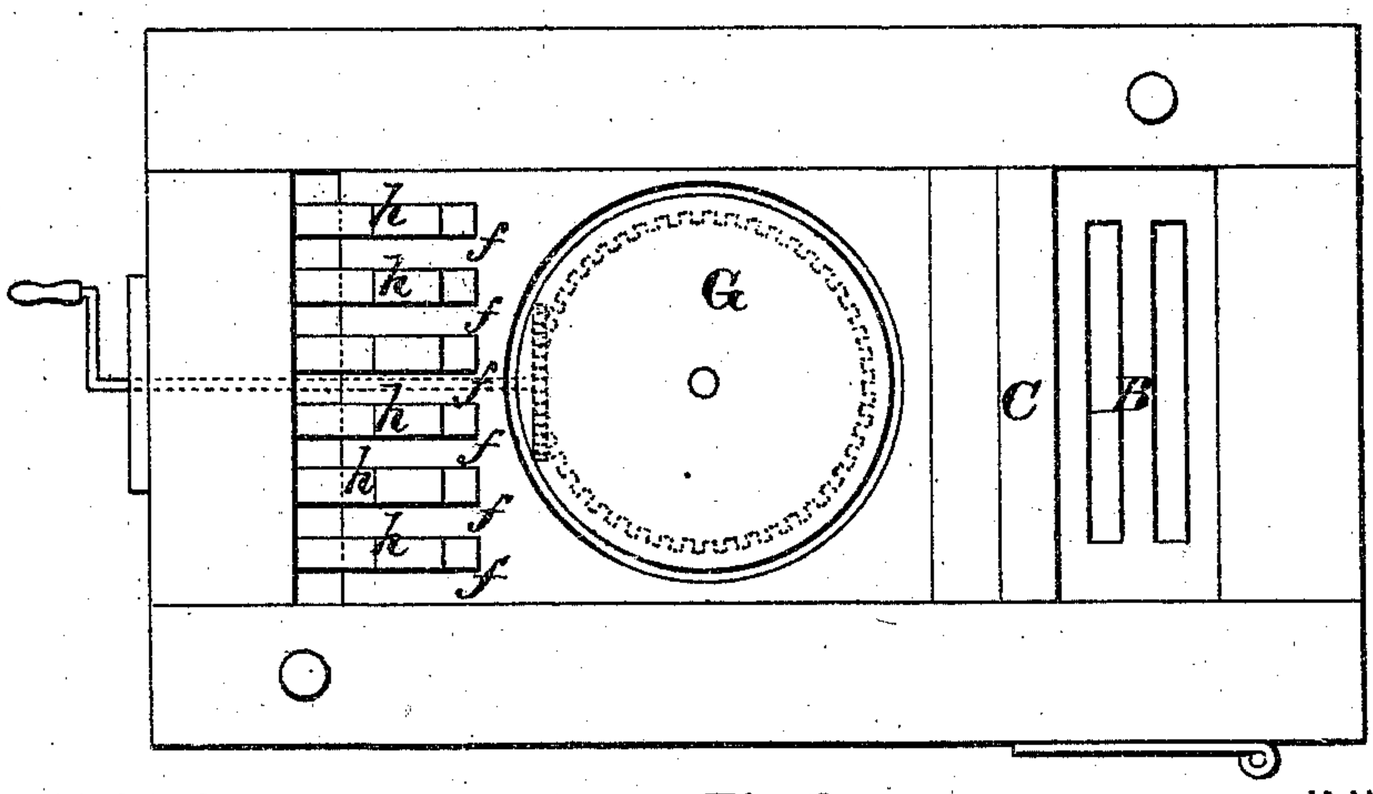

Fig. 2.

WITNESSES.

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George E. Upham,

INVENTOR.

William M. Watson,

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Attorneys.

2 Sheets--Sheet 2.

W. M. WATSON.

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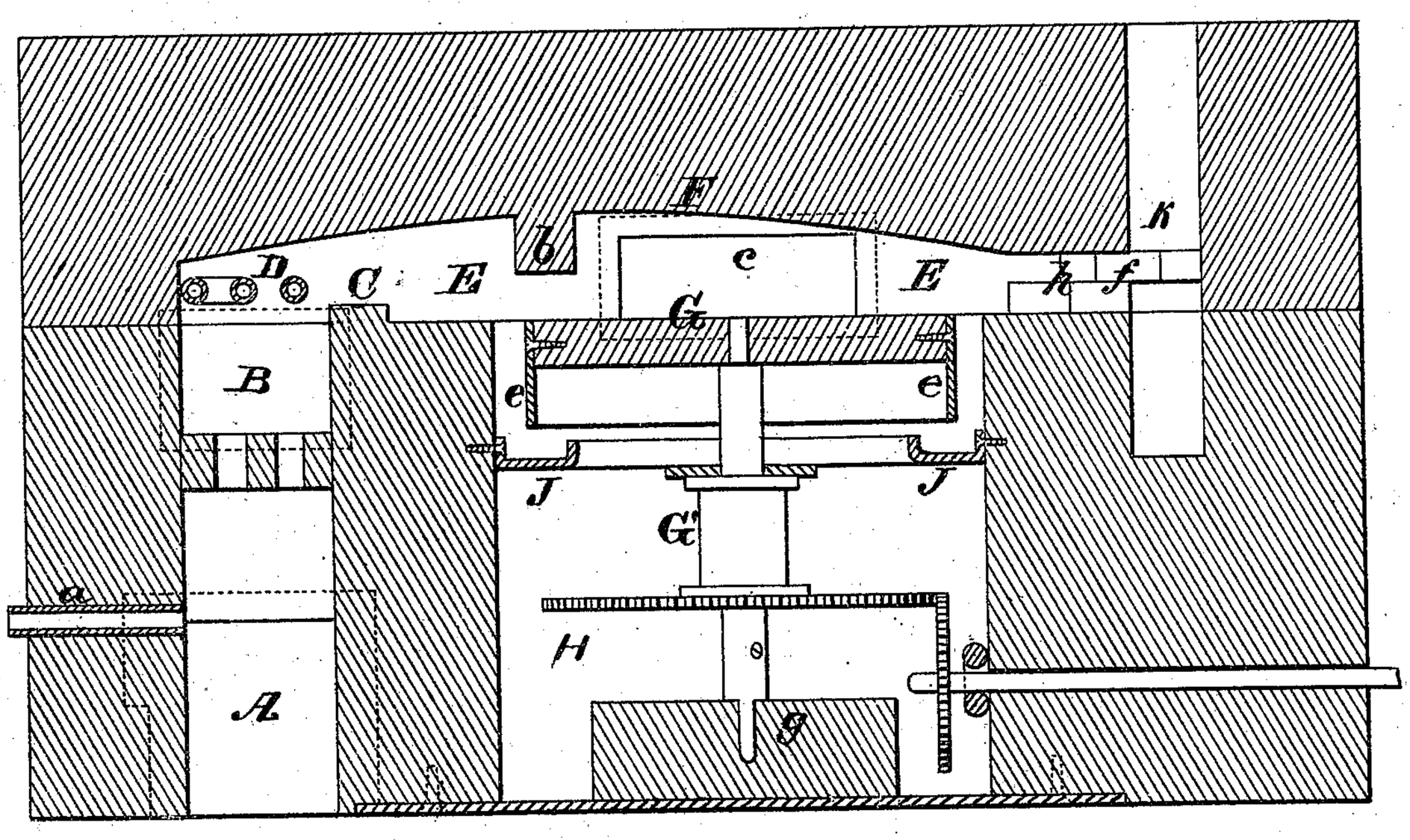

Fig. 3.

WITNESSES.

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UNITED STATES PATENT OFFICE.

WILLIAM M. WATSON, OF TONICA, ILLINOIS.

IMPROVEMENT IN FURNACES FOR TEMPERING CASTINGS, &c.

Specification forming part of Letters Patent No. **143,548**, dated October 7, 1873; application filed August 9, 1873.

To all whom it may concern:

Be it known that I, WILLIAM M. WATSON, of Tonica, in the county of La Salle and State of Illinois, have invented a new and valuable Improvement in Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a bottom view of the top half of my furnace. Fig. 2 is a top view of the bottom half of the same. Fig. 3 is a sectional view, and Figs. 4 and 5 are details, of the same.

This invention relates to certain novel improvements, which are especially applicable to the furnace for tempering castings, for which Letters Patent of the United States were granted to me on the 6th day of February, 1872. My improvement relates to the introduction of either air or steam into the combustion-space for the twofold purpose of promoting combustion and increasing the draft of the furnace; also, to a new mode of packing the space around the turn-table to prevent the introduction of air through such space into the furnace-chamber; also, to an overhanging wall or deflecting ridge which will direct the heated products downwardly upon the turn-table; also, to a new and simple method of regulating the escape of the product of combustion by a peculiar arrangement of brick passages leading into the main flue of the furnace, in combination with movable closing-bricks, whereby any one or more of the said passages can be partially or wholly closed at pleasure by means of said movable bricks.

In the accompanying drawings, A represents the ash-pit, into which air is admitted through a pipe, *a*, or in any other suitable manner. B is the fire-chamber, and C a bridge-wall, the upper portion of which is removable for the purpose of substituting a new part when the old burns out. Directly above the fire-chamber B is a coil of perforated pipe, D, which admits jets of air into the flame-space from without for the purpose of supplying oxygen freely to the fire-chamber to promote combustion, and also to increase the draft. Instead of air, steam may be forced through said pipe-coil D for the same purpose. Rose-nozzles may be substituted for the continuous coil of perforated pipe. The products of combustion enter a reverberating chamber, E, covered by an arch, F. After leaving the fire-chamber, and by means of a bridge-wall, *b*, which depends from said reverberating arch F, the heated products are directed downwardly upon the castings to be tempered, and are thus brought more intimately into contact with the castings. I thus utilize the heat by preventing a considerable quantity of it from escaping over the castings without being brought into contact with them. The said bridge-wall *b* is arranged directly over the front part of a horizontally-rotating hearth-table, G, on which the castings to be tempered are placed, and with which access can be had by means of an opening, which is closed by a gallows-suspended gate, *c*. The hearth-table G is sustained upon the upper end of a vertical shaft, G′, which is stepped in a block, *g*, in a chamber, H, and which may be rotated by means shown in the drawings, or in any other suitable manner. Around the circular hearth-table G is a flange, *e*, which dips down into an annular pan, J, which pan is fixed to the wall surrounding chamber H, and receives ashes that cover the lower part of the said flange *e*, and thus make an ash-packing that prevents air from below entering the tempering-chamber above. This feature of my invention is clearly shown by Fig. 3, which represents the annular table-flange *e* dipping down into the annular ash-pan J. After the products of combustion pass over the hearth-table G they escape into the chimney-flue K through a number of longitudinal channels, *f*, which are formed by brick partitions *h h*, arranged from side to side of the reverberating chamber E, and supported upon the stationary part of the hearth at the contracted outlet of this reverberating chamber. There are two courses of brick in each partition *h*, and the courses are so arranged that a half-brick is left exposed in each course in front, as shown in Figs. 2, 3, 4, and 5. The exposed

half-bricks are designed to afford elevated supports for supplemental movable bricks *j'*, which will close the upper half of the spaces between all or any number of the partitions, as may be required.

If it is desired to still farther check the draft of the furnace, the lower half of any desired number of the partitions may be closed by other movable bricks, *j'*, as represented in Figs. 4 and 5. In this way, and by these simple means, an equable distribution of heat over the rotary tempering-table is always maintained. At the same time the draft can be regulated to a nicety.

I am aware that the broad idea of introducing jets of air or steam into furnace-chambers is not new; and I do not claim such contrivance when considered alone.

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

1. The combination of the air or steam jet pipe or nozzle D with the fire-chamber B, reverberatory chamber E, and rotary tempering or hearth table G, substantially as described.

2. The annular ash-pan J, combined with the annular flange *e* and the rotary table G, substantially as described.

3. In a furnace for tempering castings, the reverberating chamber E, having an overhanging wall or deflecting bridge, *b*, which will direct the heated products downwardly upon the castings on the turn-table, substantially as described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

WILLIAM MEDD WATSON.

Witnesses:

ELIAS W. WOOD,

G. G. PRATT.