

(No Model.)

E. P. MATHEWSON.
FURNACE TAP.

No. 483,936.

Patented Oct. 4, 1892.

Fig. 1.

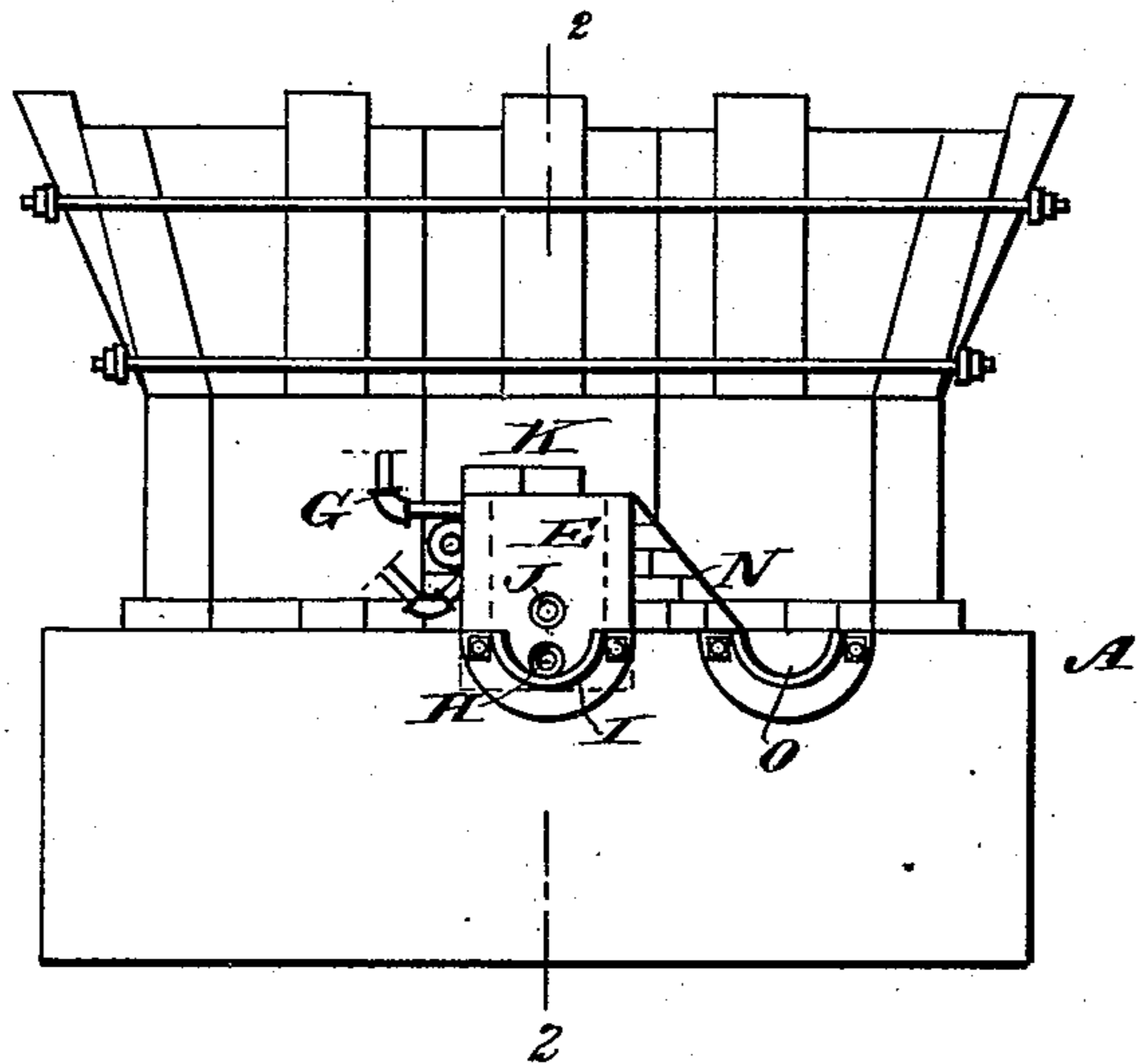
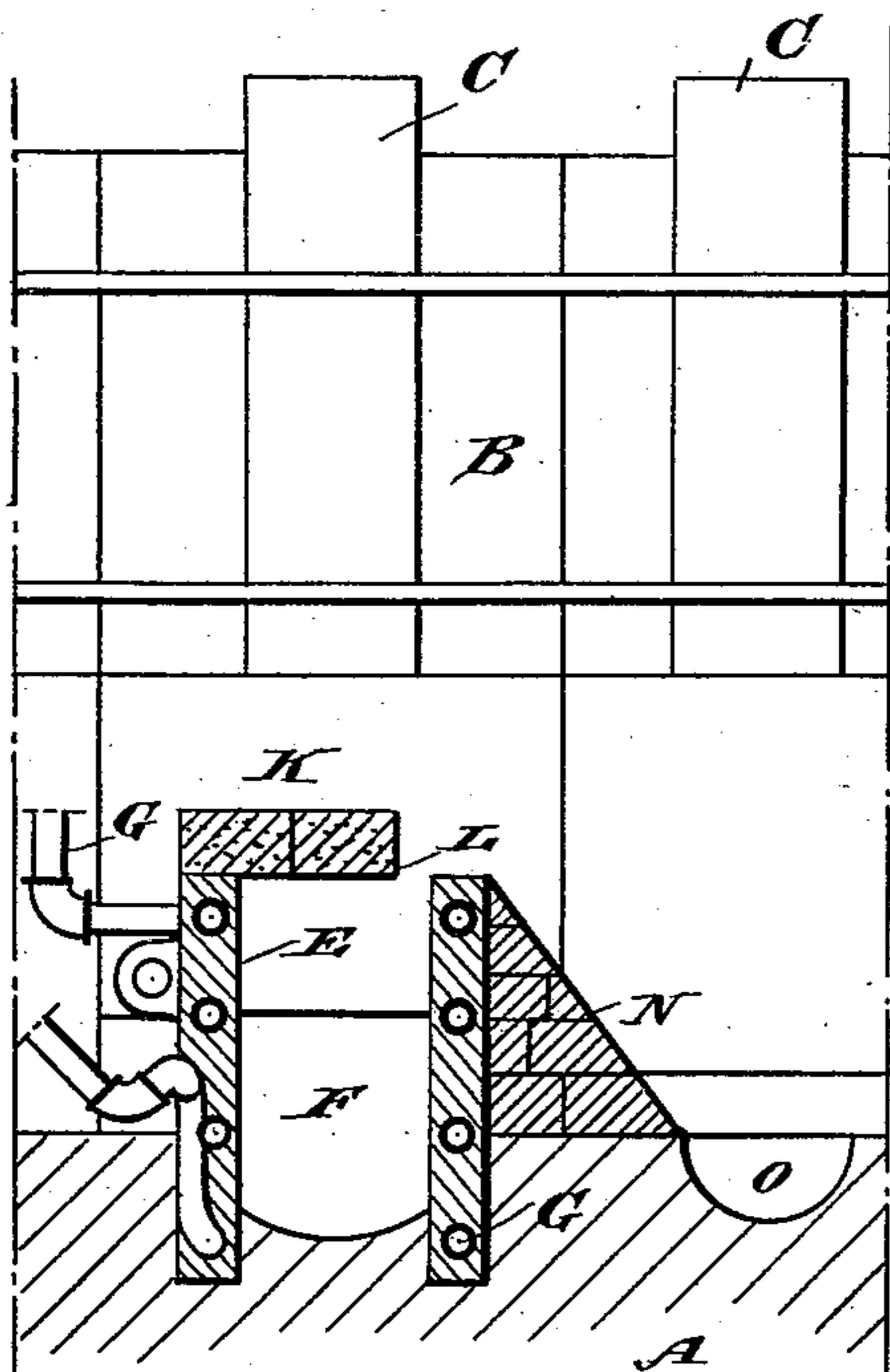


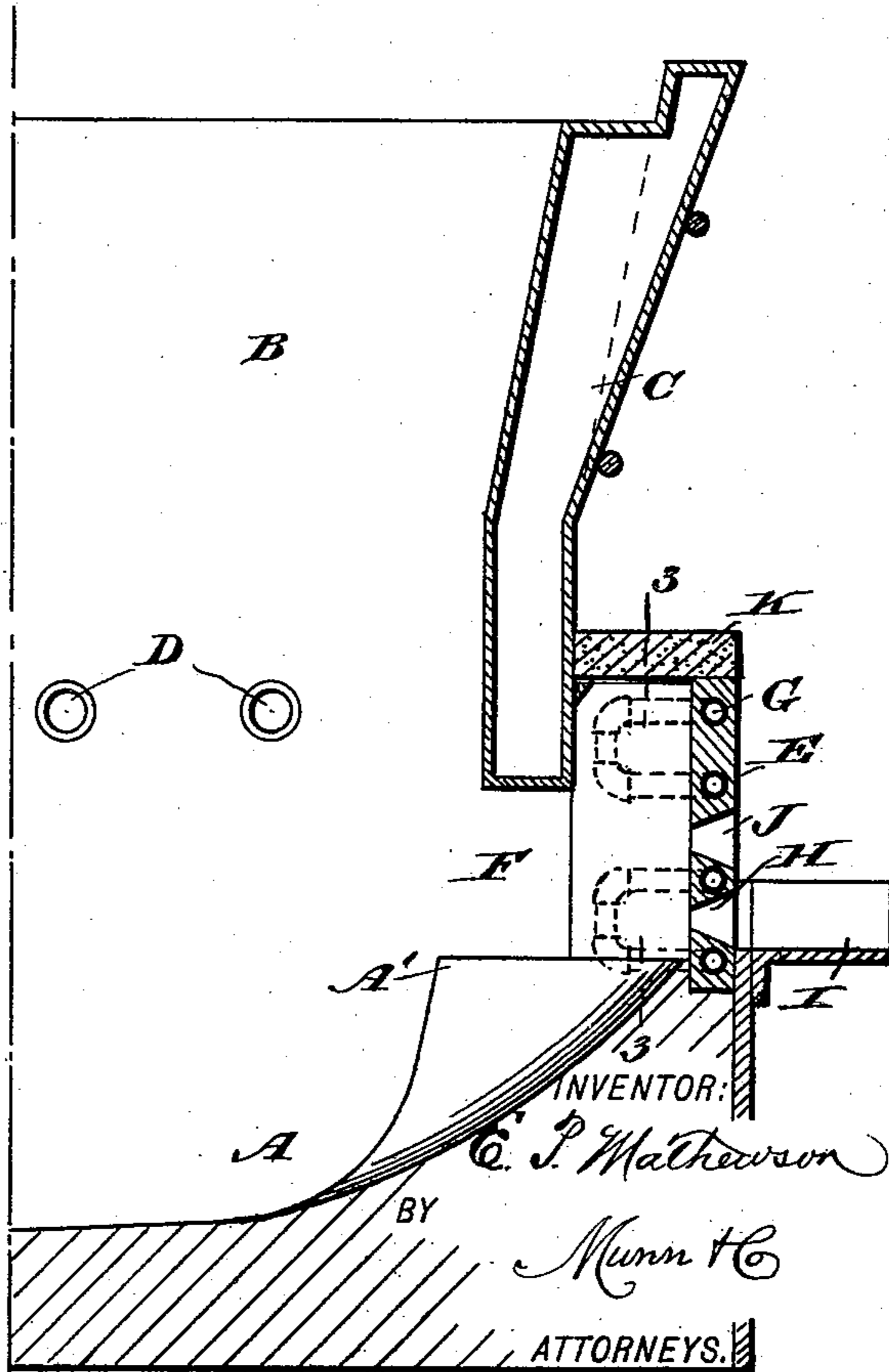
Fig. 3.



WITNESSES:

Donn Twitchell
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Fig. 2.



UNITED STATES PATENT OFFICE.

EDWARD PAYSON MATHEWSON, OF PUEBLO, COLORADO.

FURNACE-TAP.

SPECIFICATION forming part of Letters Patent No. 483,936, dated October 4, 1892.

Application filed March 4, 1892. Serial No. 423,720. (No model.)

To all whom it may concern:

Be it known that I, EDWARD PAYSON MATHEWSON, of Pueblo, in the county of Pueblo and State of Colorado, have invented a new and Improved Furnace-Tap, of which the following is a full, clear, and exact description.

The invention relates to blast-furnaces for smelting silver, lead, copper, or other ore; and its object is to provide a new and improved tap, which is simple and durable in construction, arranged to readily separate the slag from the matte, and to form an unobstructed outlet for the slag.

The invention consists of certain parts and details and combinations of the same, as will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation of the improvement. Figure 2 is an enlarged transverse section of the same on the line 2 2 of Fig. 1, and Figure 3 is an enlarged sectional front view of the same on the line 3 3 of Fig. 2.

The furnace on which the improvement is applied is of the usual construction and is provided with the hearth or crucible A, on which is mounted the bosh B, formed of a series of water-cooled sections C and with the tuyere-openings D, as plainly shown in the drawings. On the front of the furnace is arranged a casing E, formed with front and side walls and connected at its inner open end near the bottom with an opening F, leading to the interior of the furnace at the hearth A', as is plainly illustrated in Fig. 2. In the sides and front of the casing E is arranged a water circulation by means of pipes G, so that the casing is kept cool.

In the front of the casing E is arranged a tap-hole H, made conical, the base end extending outwardly and opening into a trough I for carrying and guiding the matte to a suitable receptacle or channel. Above this tap-hole H is arranged an auxiliary tap-hole J, used in case of accident. The top K of the casing E is formed of fire-brick or other suitable material and is arranged to leave an opening L near one side for the discharge of the slag. On this side of the casing, next to

the L, is arranged an incline N, which leads to a trough O, arranged in front of the furnace and parallel to the trough I. It is understood that the upper interior part of the casing E is a suitable distance above the top of the inlet F, one of the water-sections C projecting a sufficient distance down in the rear end of the casing, so as to form this open space, which has its outlet at the opening L. When the furnace is in use, then the slag and matte gradually rise in the crucible A of the furnace, so as to finally enter through the opening F into the casing E, the matte-holes H and J being closed by the usual clay plugs or other means, while the opening L is uncovered and the pressure on the inside of the furnace on the molten metal causes the slag to rise until it finally passes through the opening L over the incline N down into the trough O to be discharged on the outside of the furnace. Meanwhile the matte gradually rises in the casing E and is finally tapped at H in the usual manner and from time to time, according to the amount produced in the furnace. The matte flows through the trough I to a suitable receptacle held below or to a channel in the usual manner. The height of the opening L is determined by the position of the tuyere-openings D, so that the slag overflows through the said opening L before it can possibly pass into the tuyere-openings. The tap-holes H and J are so arranged as to allow the examination of the interior of the furnace by means of rods or bars when necessary.

It will be seen that by this invention the slag is separated from the matte and a continuous flow of slag is obtained from the furnace without interfering in the least with the ready discharge of the matte whenever the casing E is tapped at the tap-hole H. It will further be seen that the slag in the furnace can be maintained at a fixed level at all times, and noxious fumes cannot escape from the slag-opening L, as the casing E is filled with material—that is, matte and slag—and consequently the blast cannot penetrate into the casing. By this arrangement the handling of slag discharged from the furnace is materially reduced in cost, and at the same time contamination of slag with the matte is en-

5 tirely avoided. It is understood that the slag is first to go up in the casing, while the matte is tapped out at its natural level to effect separation. Heretofore most separators depended on the matte sinking in a chamber or pocket to be then tapped out at a lower level than the slag.

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

15 1. In a furnace-tap, the combination, with a casing in communication at the lower part of its rear open end with the interior of the furnace, the front of the casing being formed with a tap-hole for the matte, and the top formed with a discharge-opening for the slag, of an incline arranged on one side of the said casing next to the said discharge-opening and a trough at the bottom of the said incline, substantially as shown and described.

20 2. The herein-described furnace-tap, comprising the casing E, having front and side walls, main and safety openings H J through

the lower portion of its front wall for the discharge of matte, water-circulating pipes in the front and side walls, a top K, and an opening L at one side of the top for the continuous discharge of slag, substantially as set forth.

30 3. In a furnace-tap, the combination, with a casing in communication at the lower part of its rear open end with the interior of the furnace, the front of the casing being formed with a tap-hole for the matte and the top with a discharge-opening for the slag, of an incline arranged on one side of the said casing next to the said discharge-opening, a trough at the bottom of the said incline, and a spout arranged on the front of the said casing below the said tap-hole for the matte, substantially as shown and described.

EDWARD PAYSON MATHEWSON.

Witnesses:

JOHN J. CROOKE,
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