

(No Model.)

J. N. MOERATH.
FURNACE.

No. 353,230.

Patented Nov. 23, 1886.

FIG. 1.

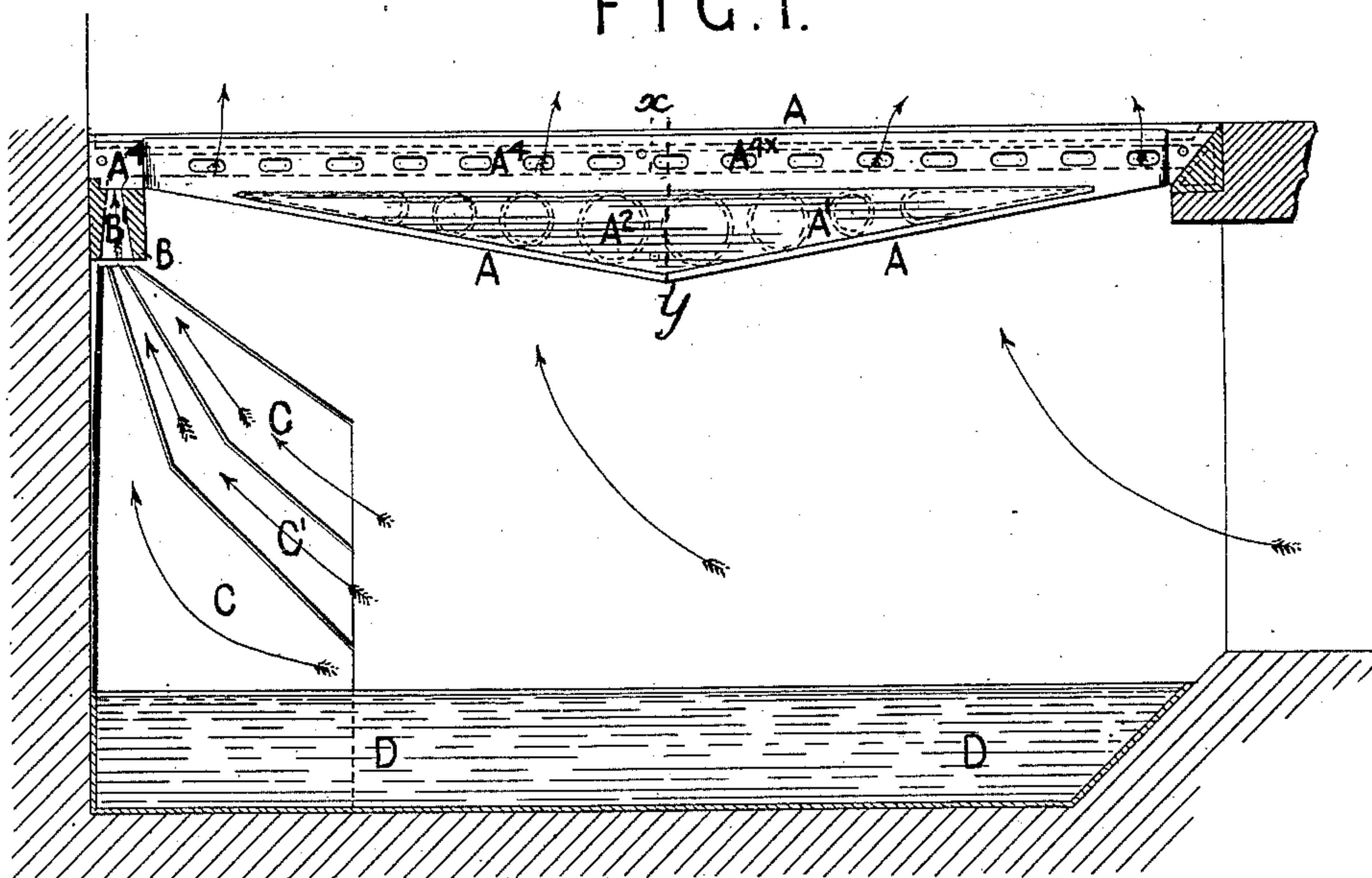


FIG. 2.

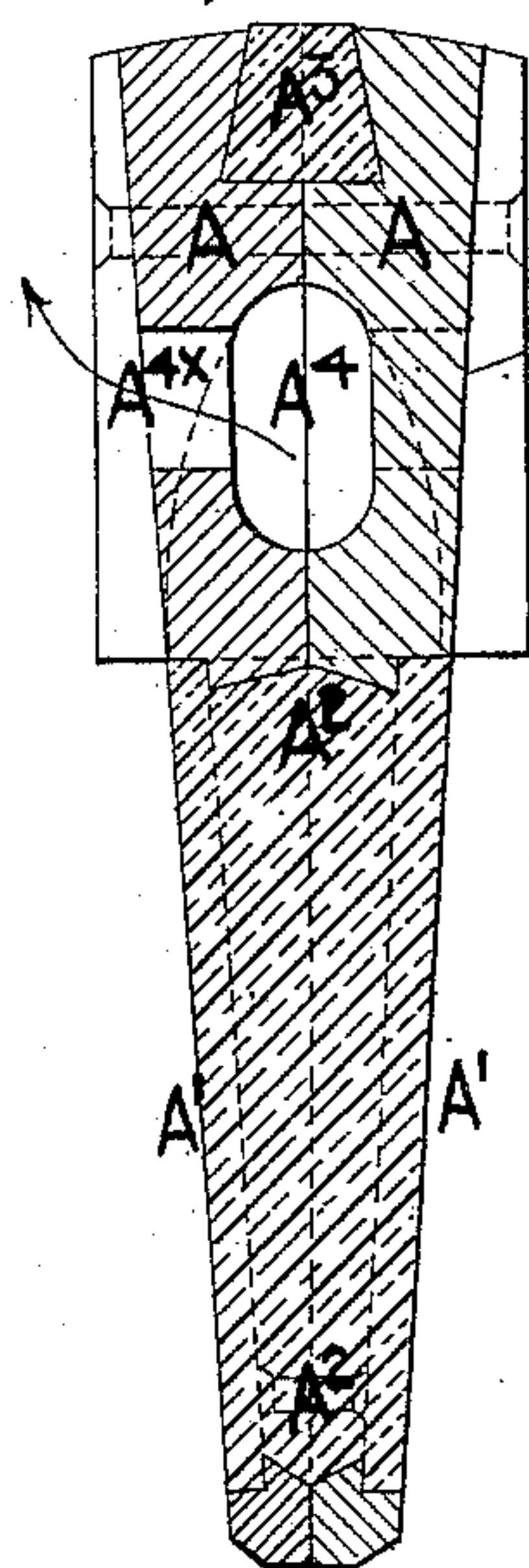


FIG. 3.

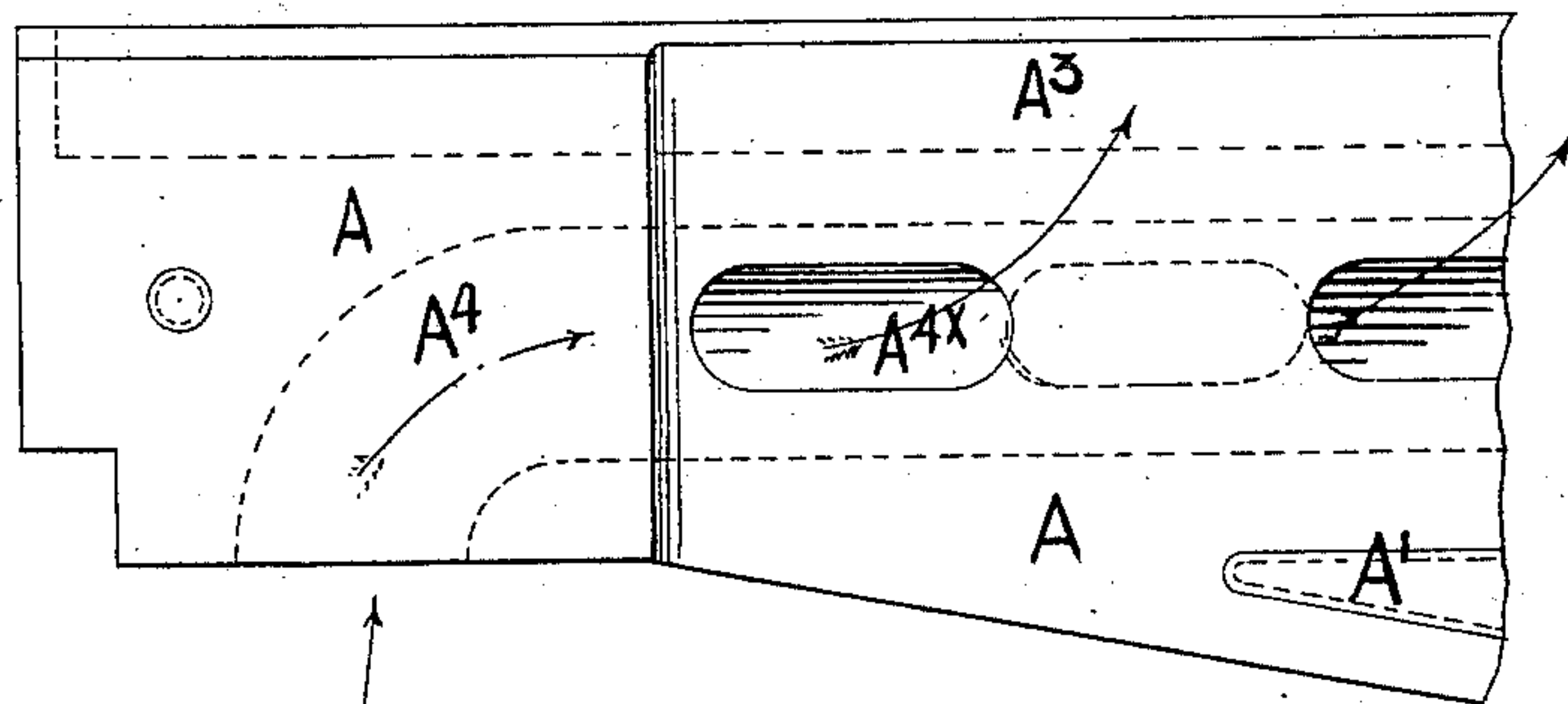
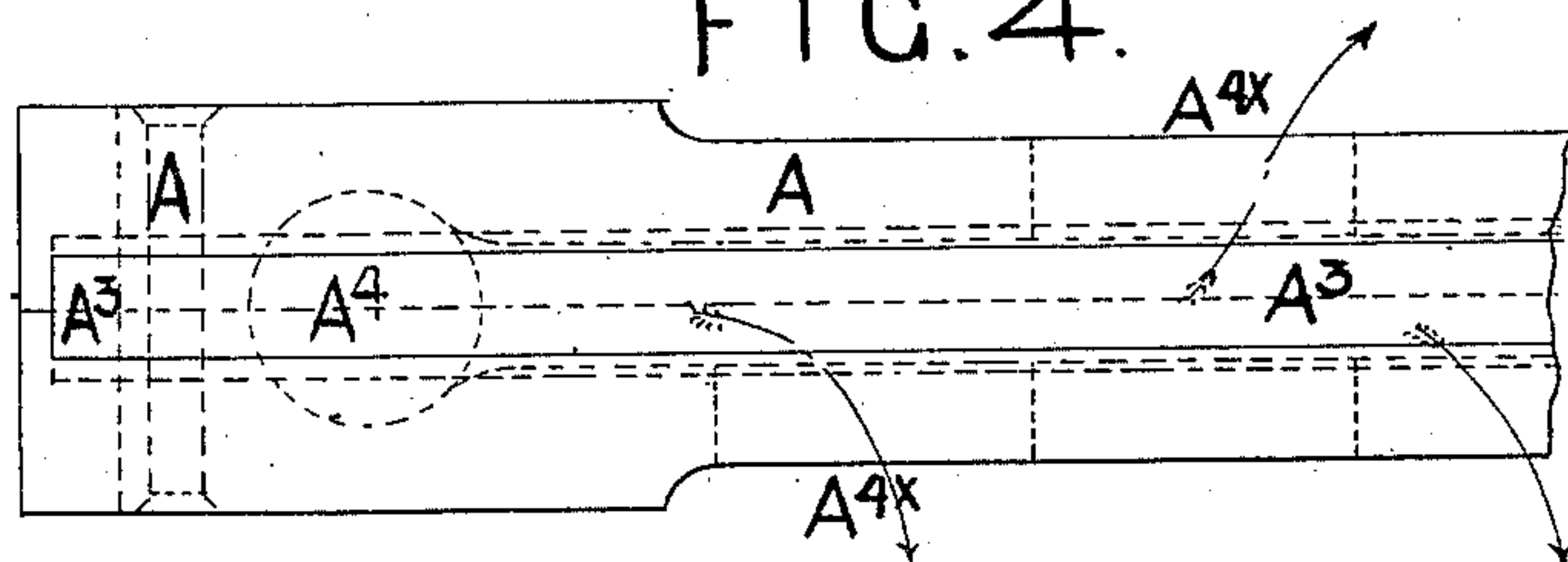


FIG. 4.



Witnesses

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JOHN NEPOMUC MOERATH, OF KILBURN PARK ROAD, COUNTY OF MIDDLESEX, ENGLAND.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 353,230, dated November 23, 1886.

Application filed September 10, 1886. Serial No. 213,190. (No model.) Patented in England November 10, 1883, No. 5,320, and November 21, 1884, No. 15,356; in Germany January 26, 1884, No. 31,157; in France April 18, 1884, No. 161,596, and in Belgium April 18, 1884, No. 64,868.

To all whom it may concern:

Be it known that I, JOHN NEPOMUC MOERATH, a subject of the Emperor of Austria, residing at Kilburn Park Road, in the county of Middlesex, England, civil engineer, have invented certain new and useful Improvements in Apparatus or Appliances in Connection with Fire-Places, Stoves, and Furnaces, (for which patents have been granted me in the following countries, viz: Great Britain, dated November 10, 1883, No. 5,320; Germany, dated January 26, 1884, No. 31,157; France, dated April 18, 1884, No. 161,596; Belgium, dated April 18, 1884, No. 64,868; Great Britain, dated November 21, 1884, No. 15,356,) of which the following is a specification.

The object of my invention is to economize fuel by obtaining a more perfect combustion and consequent consumption of smoke, as well as preventing the adhesion of "clinkers" to the fire-bars. For this purpose I employ a system comprising the automatic suction of air, combined with aqueous vapor from a cistern in the ash-pit, which together are mixed in proper proportions with the developed carbonic-oxide gases. This enables me to obtain, as aforesaid, more perfect combustion of fuel and the smoke evolved therefrom and greater heat, while at the same time effecting an immense saving of fuel. To this end I employ a water pan or cistern placed in the ash-pit under the fire-grate, the vapor from which, in combination with the atmospheric air, is driven through hollow fire-bars with great velocity by an injector-shaped air-sucker placed below the fire-bars and above the water pan or cistern. The hollow fire-bars are fitted with fire-clay for the purpose of superheating and creating a draft by drawing air and vapor from the water through the air-sucker, and by this construction of fire-bar the adhesion of clinkers is prevented.

In the accompanying drawings I have illustrated a convenient way of carrying my invention into effect, Figure 1 being a section of a furnace showing my improvements applied thereto. Fig. 2 is an enlarged cross-section of one of the hollow fire-bars, taken on line *xy* of Fig. 1. Fig. 3 is a partial elevation of one end of a fire-bar, and Fig. 4 a plan view of Fig. 3.

Referring to the drawings, A is one of the fire-bars formed in two halves longitudinally, (see Fig. 2,) and held together by bolts or rivets. Fire-clay A' is forced while in a plastic state into the apertures and recesses provided in the central and lower portion of the fire-bar, and retained therein by its being forced through and hardening in the apertures marked A², Fig. 1, and having dovetailed edges, as best seen in the section at Fig. 2. A space, A³, is also provided at the upper edge of the fire-bar and of dovetail section, and is also filled in with fire-clay.

A⁴ is the hollow space passing throughout the length of the fire-bar, and having side openings, A^{4x}, on each side alternately. At one end, as shown at Fig. 1, the aperture A⁴ has a downward curve, and comes opposite and communicates with conical-shaped apertures B', formed in a resting bar or bearer, B, there being one such conical aperture in the length of such bearer B for each fire-bar resting thereon.

C C' are the injector-shaped air-suckers or tuyeres through which the air travels, as indicated by the arrows in Fig. 1. These tuyeres C C' are preferably arranged, as shown, within one another, and are curved or bent in an upward direction. The upper end of the inner tuyere, C', is smaller than the outer one, causing an induced current of air by giving a greater velocity to and sucking up of the air through the larger tuyere, C. This injector-like tuyere may extend the length of the bearer B, or there may be several for each furnace.

In the ash-pit, and passing below the fire-bars, I provide a cistern or tank for containing water supplied from any convenient source, which cistern may or may not be made removable, as preferred.

When in action, the air mixing with the vapor from the water is drawn or sucked up by the injector-like double tuyeres C C'. The action of these tuyeres tends as the current of air passes upward to quicken same, on the well-known induced-current principle, and passing through the conical apertures B' in the bearer B enters the aperture A⁴ in the length of the fire-bar. The air and vapor pass by the side apertures, A^{4x}, into the fire in a highly-super-

heated condition, and the hydrogen and oxygen composing the vapor are here separated, whereby I obtain more perfect combustion, greater heat, &c., while at the same time it is
5 to be observed that no steam, water, or heat is withdrawn from the boiler, to the detraction of its effective results, and provided (and so long as) water is supplied to the water-cistern the entire apparatus is wholly automatic in its
10 action.

I claim as my invention—

The combination, with hollow fire-bars

having apertures, of the hollow bearer B, with openings leading into the hollow fire-bars, and the air-suckers or tuyeres C C' below the hol- 15 low bearer, and acting to heat the air and vapor from a water-pan and pass the same into the fire, substantially as specified.

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Witnesses:

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