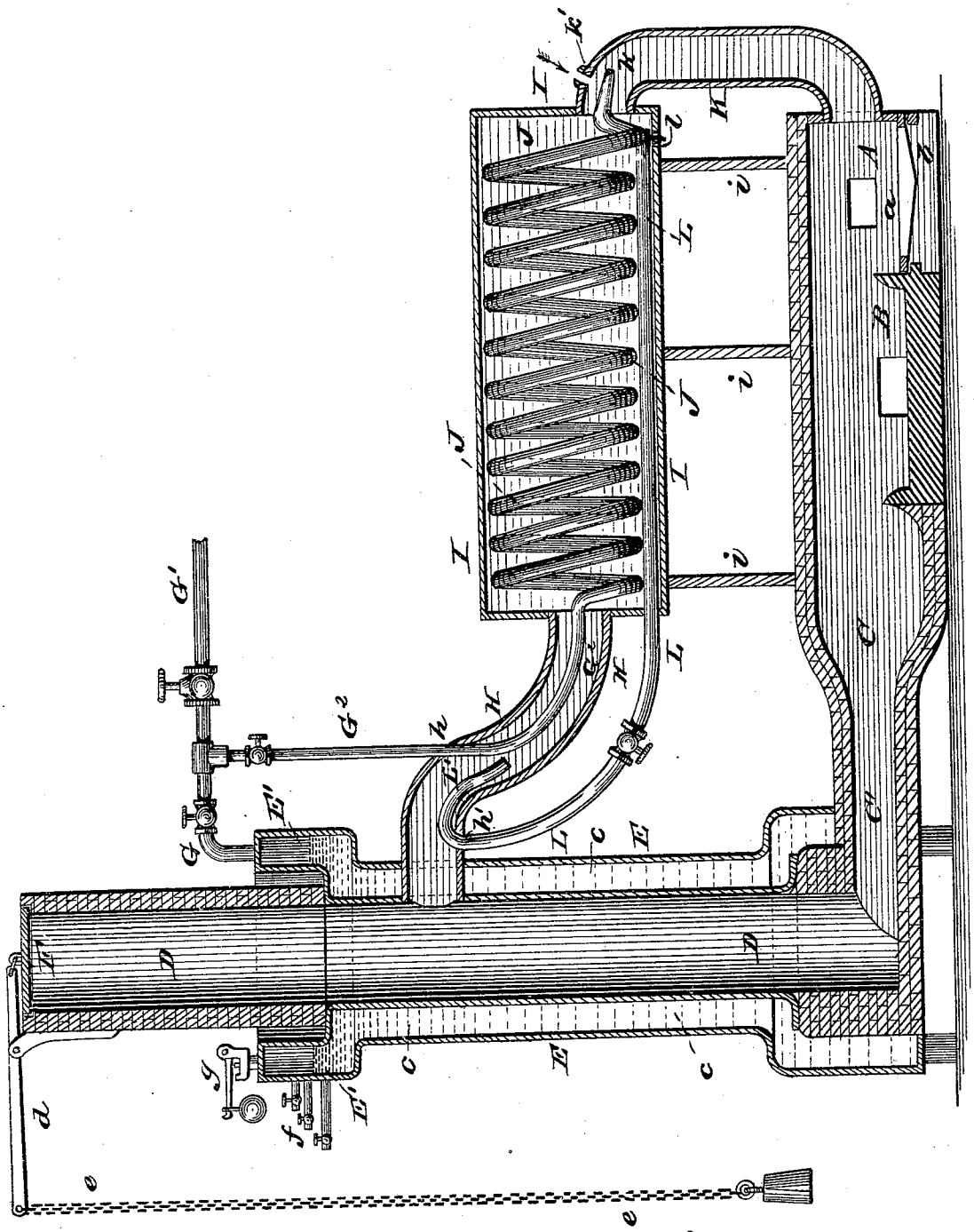
(No Model.)

H. NEAHOUS.

METALLURGIC FURNACE.

No. 248,496. Patented Oct. 18, 1881.



WITNESSES

Fred. L. Dieterich.

P. C. Dieterich.

INVENTOR.

Herman Neahous.

By his Attorneys

Louis Bagger & Co

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

HERMAN NEAHOUS, OF SHARPSBURG, PENNSYLVANIA.

METALLURGIC FURNACE.

SPECIFICATION forming part of Letters Patent No. 248,496, dated October 18, 1881.

Application filed May 16, 1881. (No model.)

To all whom it may concern:

Be it known that I, HERMAN NEAHOUS, of Sharpsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Metallurgic Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, which forms a part of this specification, and in which I have shown my improved furnace with its attachments and appurtenances in longitudinal vertical section.

My invention has relation to that class of metallurgic furnaces in which the stack is utilized for generating steam in a surrounding boiler, and which are provided with devices for injecting a jet of superheated steam into the furnace; and it consists in the improvements hereinafter more fully set forth, and particularly pointed out in the claim.

In the annexed drawing, A is the fire-box, which has a grate, *a*, and ash-pit *b*, of any desired construction and arrangement. Back of this is the puddling-furnace B, or any other kind of reverberatory furnace, the neck C of which is contracted to form a flue, C′, which leads into the stack D. This stack is made with a surrounding jacket, E, forming an annular space, *c*, which is filled with water and constitutes a tubular boiler around the central stack, D, steam being generated by the heat of the products of combustion passing up through the central flue or stack, D, which has a hinged damper, F, at its upper end, that may be operated by means of a lever, *d*, having a rod or chain, *e*, at its outer end, reaching down to the floor. The boiler E does not extend all the way up to the top of the stack, but terminates in the steam-drum E′, encircling the stack, which is provided with a set of water-gages, *f*, a safety-valve, *g*, of any approved construction, and the steam-pipe G. The latter has two branches, one of which, G′, leads to the engine, while the other, G^2, is inserted at *h* into a flue, H, which branches off from one side of the stack D and connects it with the superheating-chamber I, which is supported upon pillars *i i* above the furnaces A B. The lower or inner end of pipe G^2 connects with a coil of pipe, J, arranged within the chamber I, extending from one end to the other of said chamber, with its outer end forming an injector-nozzle, *k*, which projects into a pipe, K, that opens out into the front part of the fire-pot or furnace A. The coiled pipe J has another outlet, *l*, closed by a suitably-constructed valve, which connects with the pipe L, which enters the flue H at *h′*, where it is bent in a downward direction to form a nozzle, L′. The several pipes and flues are provided with suitably-arranged valves and dampers in order to properly regulate and control the operation of the apparatus, which is as follows:

When it is desired to generate steam the damper F at the upper end or outlet of the stack is closed, which causes the smoke and other products of combustion to escape from the stack through the branch flue H into chamber I. As the steam is being generated it escapes from the branched pipe G, part being conducted through the branch G′ to the engine, while part passes through the branch G^2, by way of flue H, into the coil J, where it becomes superheated or dry steam by the action of the blaze and heat in chamber I. As superheated steam it is injected through nozzle *k* into the pipe K, within which it mixes with the products of combustion from chamber I, and is in this condition injected into the fire-box or furnace A in the nature of a blast, thereby greatly increasing the heat and absolutely preventing waste of fuel.

If the superheated steam fed into the furnace should create too great a pressure to permit a sufficient supply of atmospheric air to enter the furnace through the grate-bars *a*, this may be remedied by making an aperture, *k′*, in the upper part of pipe K, above the nozzle *k*, so that the superheated steam, in its passage through pipe K, will be mixed with a sufficient proportion of atmospheric air to insure perfect combustion of the fuel in the furnace.

In order to increase the draft and promote a steady flow of the products of combustion through the bent flue H into chamber I, a part of the superheated steam may be turned on through valve *l* into pipe L, through which it is injected by nozzle L into the flue, thus creat-

ing the suction requisite to produce a strong draft from the stack D into chamber I.

It is obvious that, if desired, the jet of superheated steam may be conducted by the pipe K into the puddling-furnace B, instead of into the fire-box, as shown in the drawing, and, also, that the chamber I may, in some cases, be dispensed with by making the flue C′ and its stack D of sufficient size or capacity to contain the coils of pipe J, in which the steam is superheated, in which case the flue H is passed obliquely down from the stack to the furnaces A or B, as the case may be, according to where it is desired to use the superheated steam and products of combustion.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

In a metallurgic furnace, the chamber I, connected to the stack by the flue H and to the furnace by flue K, in combination with the stack-boiler D E E′, steam-pipe G G², steam-coil J, having valve *l* and nozzle *k*, and pipe L, inserted into flue H, and provided with the nozzle L′, all constructed and arranged to operate substantially in the manner and for the purpose herein shown and described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

HERMAN NEAHOUS.

Witnesses:
JOS. CHRISTIAN,
MICHAEL BARRMANN.