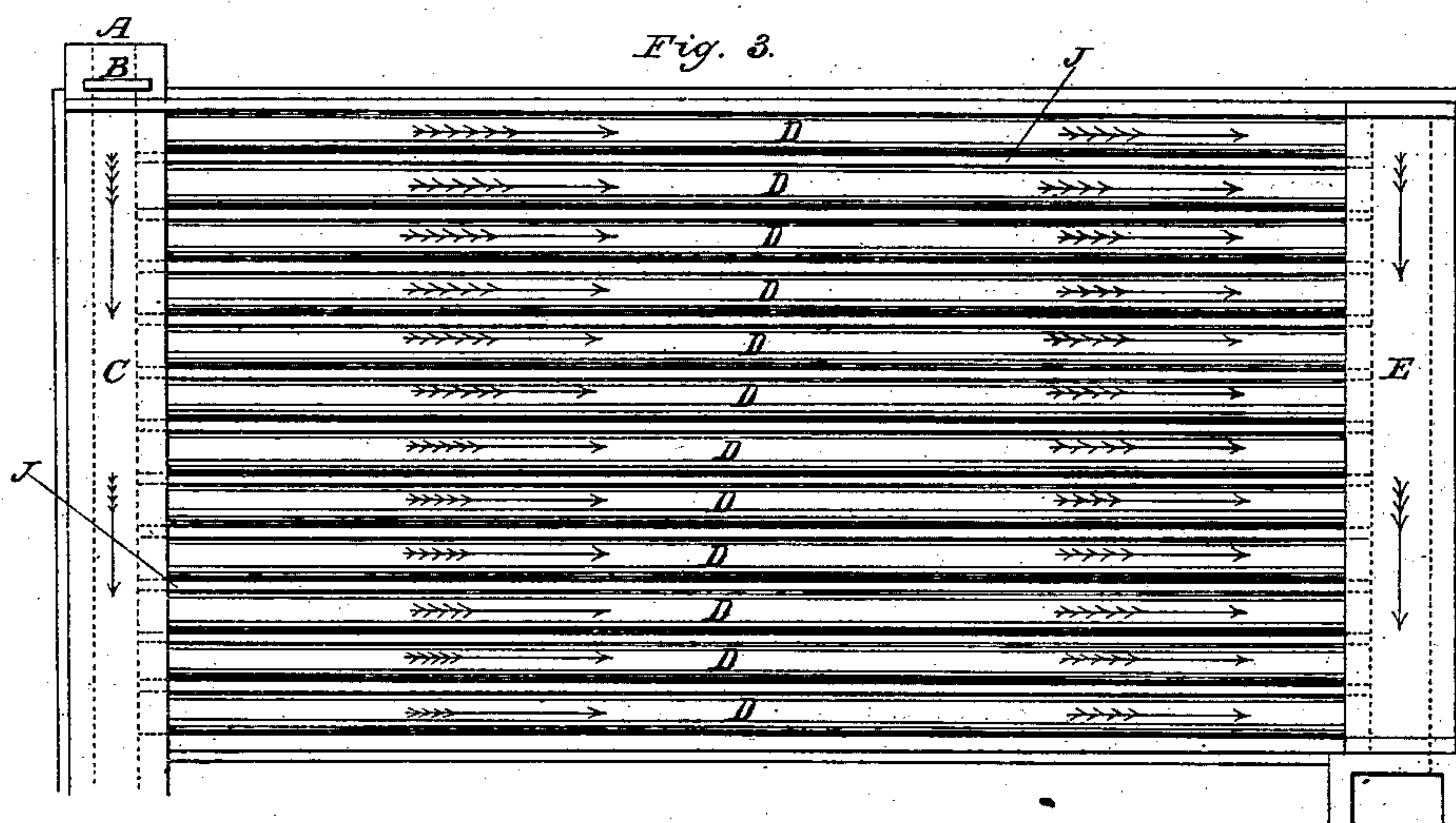
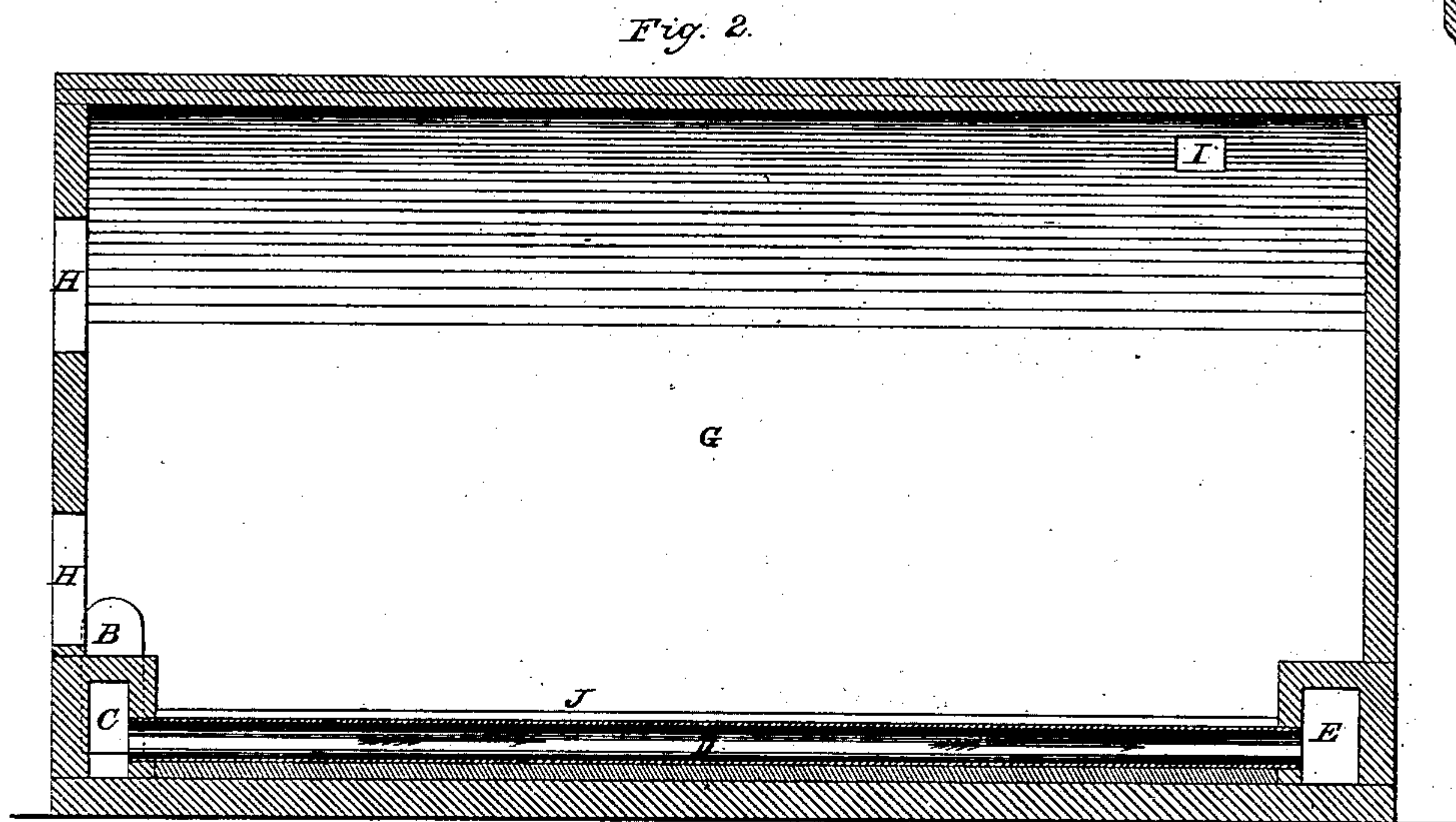
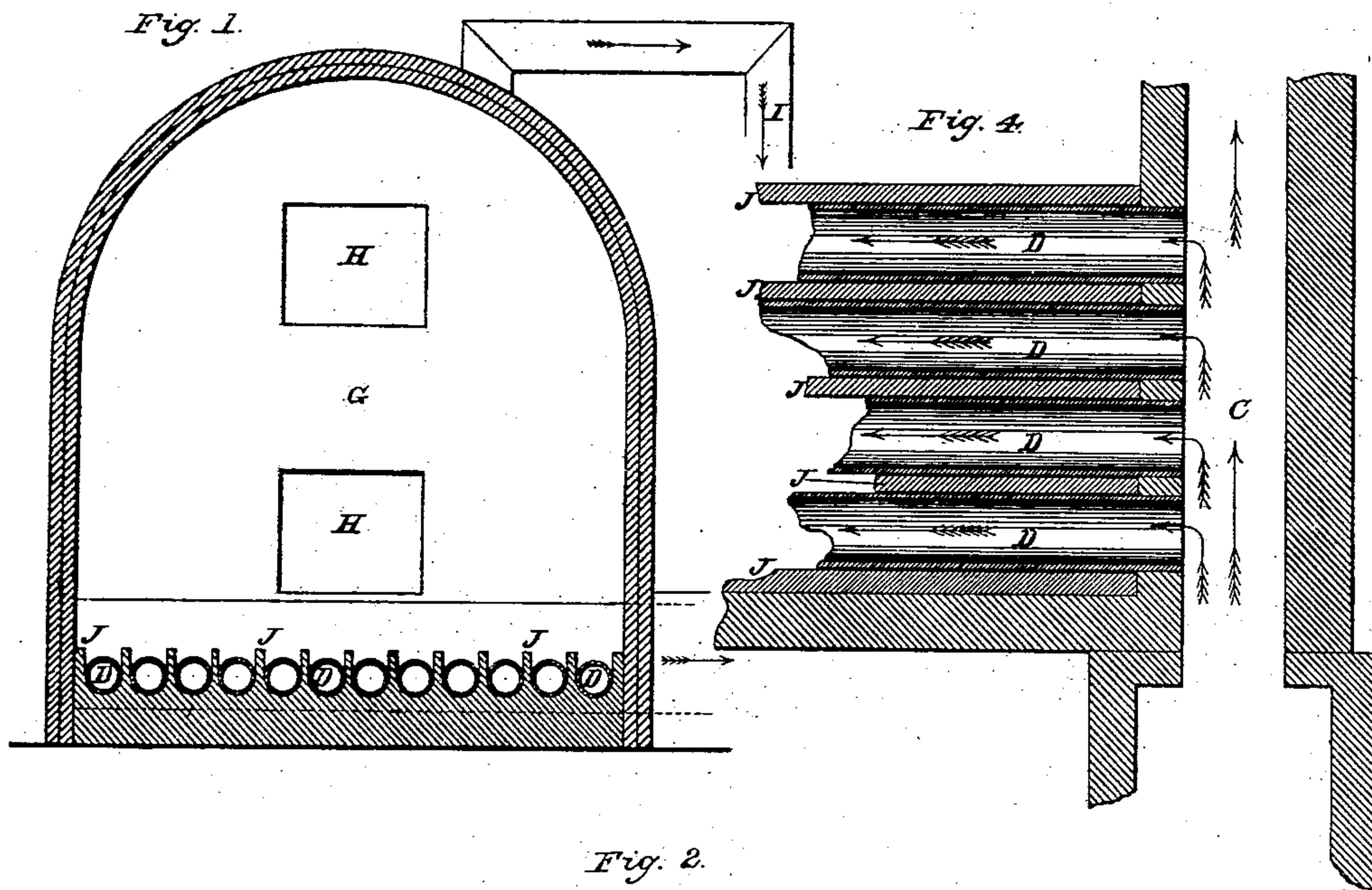


A. H. TAIT.
COOKING WOOD.

No. 5,722.

Patented Aug. 22, 1848.



UNITED STATES PATENT OFFICE.

A. H. TAIT, OF PLATTSBURG, NEW YORK.

IMPROVEMENT IN COKING WOOD BY THE WASTE HEAT OF IRON-FURNACES.

Specification forming part of Letters Patent No. 5,722, dated August 22, 1848.

To all whom it may concern:

Be it known that I, AUGUSTUS HENRY TAIT, of the town of Plattsburg, in the county of Clinton and State of New York, have invented a new and useful Improvement in the Mode of Coking Wood in a Kiln or Oven and Extracting Pyroligneous Acid from the same; and I do hereby declare that the following is a full and exact description.

The nature of my invention consists in an arrangement of horizontal flues, constructed of brick, soapstone, iron, or any other suitable material, placed parallel with each other and at a sufficient distance apart to allow walls to be built between them, the walls rising a little above the top surface of the pipes. Upon these walls I stack or pile the wood, which is thus kept from pressing upon the surface of the pipes and flattening or breaking them when in a heated state, and thereby diminishing the flue-space, or in the event of breakage allowing the flame and atmospheric air to have access to the wood and thus consume it instead of distilling from it its valuable components. I generally construct my flues about twelve or fifteen inches in diameter, with about eight inches space between them, and set twelve or more in a bed, the number depending on the size of the oven. They are found to work best about twenty feet long, the length being regulated by the temperature of the hot air in the flues, as I require that the flues should be at a red heat in order to produce the best effect in point of economy and excellence of result. The entire surface of the flues is allowed to radiate the heat, the flues being severally laid between the two contiguous bearing piers or walls directly upon a solid foundation of masonry. Thus all the heat is imparted by radiation from the flue to the wood, and then by its ascensive properties finds its way to the top of the oven or dome by which the apparatus is surrounded and covered. The upper part of the oven thus becomes heated to the proper degree of temperature, the wood becomes coked and gives off its component gases, the operation continuing in a downward direction until the whole mass of wood has been operated on. During the operation the gases are

taken from the top of the oven by a tube of proper capacity, which conducts them to the condenser, and the pyroligneous acid is here extracted.

I find that economical arrangement is made by constructing one or more ovens in connection with iron-works, the waste heat being conducted by a flue from the furnace, which flue forms a chamber from which the bed of radiating-flues belonging to the oven are led and receive the heat, which, having passed through them, is received into another flue running across the other ends of the radiating-flues. This last flue leads directly to the chimney. In the first flue is a damper to regulate the draft through the flues. Great care is taken to construct the oven of such materials and in such manner as to prevent loss of heat by radiation from the kilns or the admission of air, as I wish to secure a dry distillation of materials.

Let Figure 1 represent a vertical cross-section of the oven; Fig. 2, a vertical longitudinal section; Fig. 3, a horizontal section; Fig. 4, a detailed section, showing on an enlarged scale the end flue and the method of setting the radiating-flues.

Let A, Figs. 3 and 4, represent the entrance to the flue of the oven from the iron-furnaces; B, Figs. 2 and 3, the dampers by which to regulate the temperature of the oven; C, Figs. 2, 3, and 4, the flue from which the radiating-flues D D D, Figs. 1, 2, 3, and 4, proceed; E, Figs. 2 and 3, the flue in which they terminate and which collects the heated air from the flues D D D and conducts it to the chimney; F, Fig. 3, the draft, being in the direction indicated by the arrows drawn in red.

G, Figs. 1 and 2, represents the air-tight chamber or oven in which the wood is stacked or piled, and it is generally filled nearly to the top of the arch, the wood being passed in through the apertures H H, Figs. 1 and 2, and is laid upon the walls or piers J J J, Figs. 1, 2, 3, and 4, being laid across them in such manner as not to rest upon the flues. The remainder of the wood is then carefully piled, so as to leave sufficient space for the heat to penetrate to every part of the pile. The apertures

H H are then carefully closed and luted. The damper B being opened, the coking commences, the gases in their exit passing through the pipe I, Figs. 1 and 2, to the condenser.

I have before mentioned that I have found an advantage in point of economy in employing the waste or escape heat from iron-furnaces to coke the wood; but I do not mean to restrict myself to the location of iron-works for the establishment of my apparatus. In many situations where wood is abundant I may use either the wood or the charcoal as a fuel, unless there is a good market for the latter material.

I do not intend claiming the method of extracting pyroligneous acid from wood by the process of dry distillation. Neither do I intend claiming the coking of wood and extracting acid therefrom in a close oven, the same having been done before; but

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

The application of waste or escape heat from forge or furnace fires making iron to the purpose of coking wood by radiation from the flues D D D, constructed of iron or any other suitable material, and in the same process of coking by waste or escape heat to extract from the wood pyroligneous acid, the flues D D D being so arranged in connection with the walls or piers J J J as to prevent the wood from coming in contact with or resting upon said flues or pipes, by which means the atmospheric air is excluded and that portion of the wood consumed by the old process in coking the remainder converted into charcoal.

A. H. TAIT.

Witnesses:

GEORGE MOORE,
P. G. ELLSWORTH.