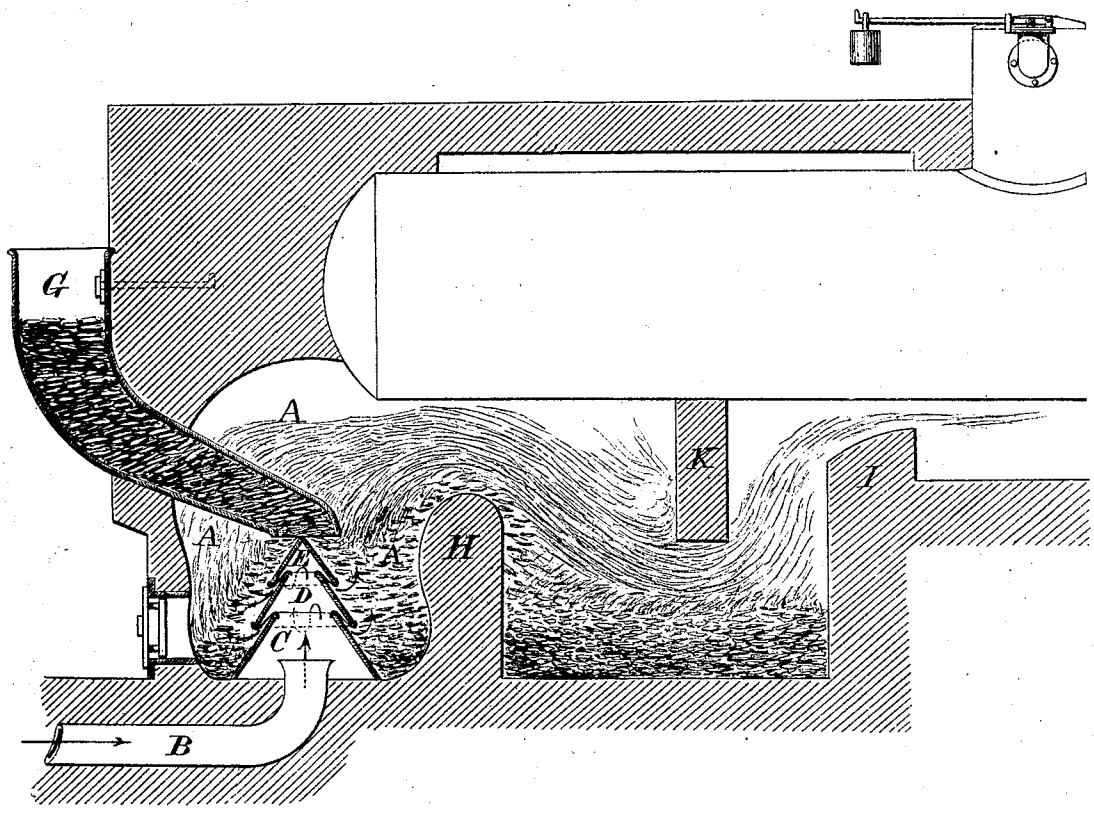
C. SCHACHER & L. FERET.

Furnaces.

No. 145,689. Patented Dec. 16, 1873.



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UNITED STATES PATENT OFFICE.

CHARLES SCHACHER AND LOUIS FERET, OF PARIS, FRANCE.

IMPROVEMENT IN FURNACES.

Specification forming part of Letters Patent No. **145,689**, dated December 16, 1873; application filed October 24, 1873.

To all whom it may concern:

Be it known that we, CHARLES SCHACHER and LOUIS FERET, of Paris, France, engineers, have invented an Improvement in Furnaces, of which the following is a specification:

Our new construction of furnace is intended to burn completely and at a high temperature all kinds of wood-waste, and the fragments, or even the powders, of all sizes and shapes of woody vegetable substances, such as fragments of logs, the irregular pieces left when cutting up wood, the waste from saw-mills, shavings, chips, sawdust, the remains of dye-wood after use, the bagasse from sugar-cane, peat-waste, and, in general, all woody waste or fragments whatever, either in the dry, damp, or green state, without appreciable smoke. Our invention consists in a furnace without a grate, and with a peculiar radiating arrangement for supplying the draft.

The furnace, properly so called, A, (see the annexed drawing,) is of brick-work, and is in the form of an urn, without feet or other support, or a grate. Its height, breadth, and interior space will be more or less great, according to the quantity, the form, and the quality of the vegetable combustible to be consumed, as well with regard to the caloric effect desired to be produced. In the center of the bottom of the furnace proper A an injection of air, forced by a fan or other means, is led by a pipe, B, of any form, under a series of truncated cones, C D, of which there may be any number, and which are surmounted by a perfect cone, E. These cones are laid one upon the other, in such a manner as to leave between each of them an annular space sufficient for the passage of the air, and for its continuous escape, through radiation, from the top to the bottom. The intervals between the several cones are also variable, according as a greater or less quantity of air is necessary in order to completely consume the various kinds and forms of vegetable combustibles. At the same time that the air is injected, the vegetable combustible matters are regularly introduced into the furnace by a conduit, G, fed either manually or by a mechanical feeder, and are projected upon the point of the upper cone, E, which distributes them throughout the furnace, as well through their natural fall as by the escape of the air through the annular spaces left between the truncated cones. The forced air, therefore, imparts to the fragments of combustible a continuous agitation in the middle of the flames until their combustion. A first fire-bridge, H, permits the passage through its upper orifice of the flame and inflamed fragments. A second and hanging fire-bridge, K, compels the flame to traverse the small half-consumed fragments in the space between the two fire-bridges.

This complete and fumiferous combustion depends, first, on the amount of combustion sent through the conduit G; second, on the quantity of air injected by the pipe B; third, on the orifice and the form of the fire-bridge H, for the escape of the flame thus produced; and, fourth, on the orifice and the form of the hanging fire-bridge K, which, forming an obstacle to the flame, utilizes the oxygen in it to complete the combustion of the little fragments contained in the space between the two fire-bridges H and K. This obstacle to the progress of the flame also allows of the excess of air which the flame still contains to burn the remainder of the smoke which remains mixed with it.

According to circumstances, any other form of injection of the air than the circular one can be given to the furnace, to the distributing-cones, and to the orifice for the escape of the flame—for example, an oval, a square, or a more or less prolonged rectangular form; and, similarly, when a great amount of heat is required to be produced, several series of air-injectors can be arranged in the same furnace.

In the heating of boilers, a third fire-bridge, K, can be arranged toward the middle of the length of the boiler, and the flames are made to follow the course of ordinary flues until they reach the chimney, which gives issue, without any signs of smoke, to the products of combustion.

We claim—

The combination of the furnace A, air-supply pipe B, hollow truncated cones C D, cone E, and feed-conductor G, the said pipe B opening below the said cones, and the conductor G opening above and upon the cone E, all substantially as specified.

In testimony whereof we have signed our names to this specification before two subscribing witnesses.

CHAS. SCHACHER.
L. FERET.

Witnesses:
J. ARMENGAUD, Jeune,
ALBERT CAHEN.