(No Model.)

C. PHELPS.

FEEDING AIR TO FURNACES.

No. 507,037. Patented Oct. 17, 1893.

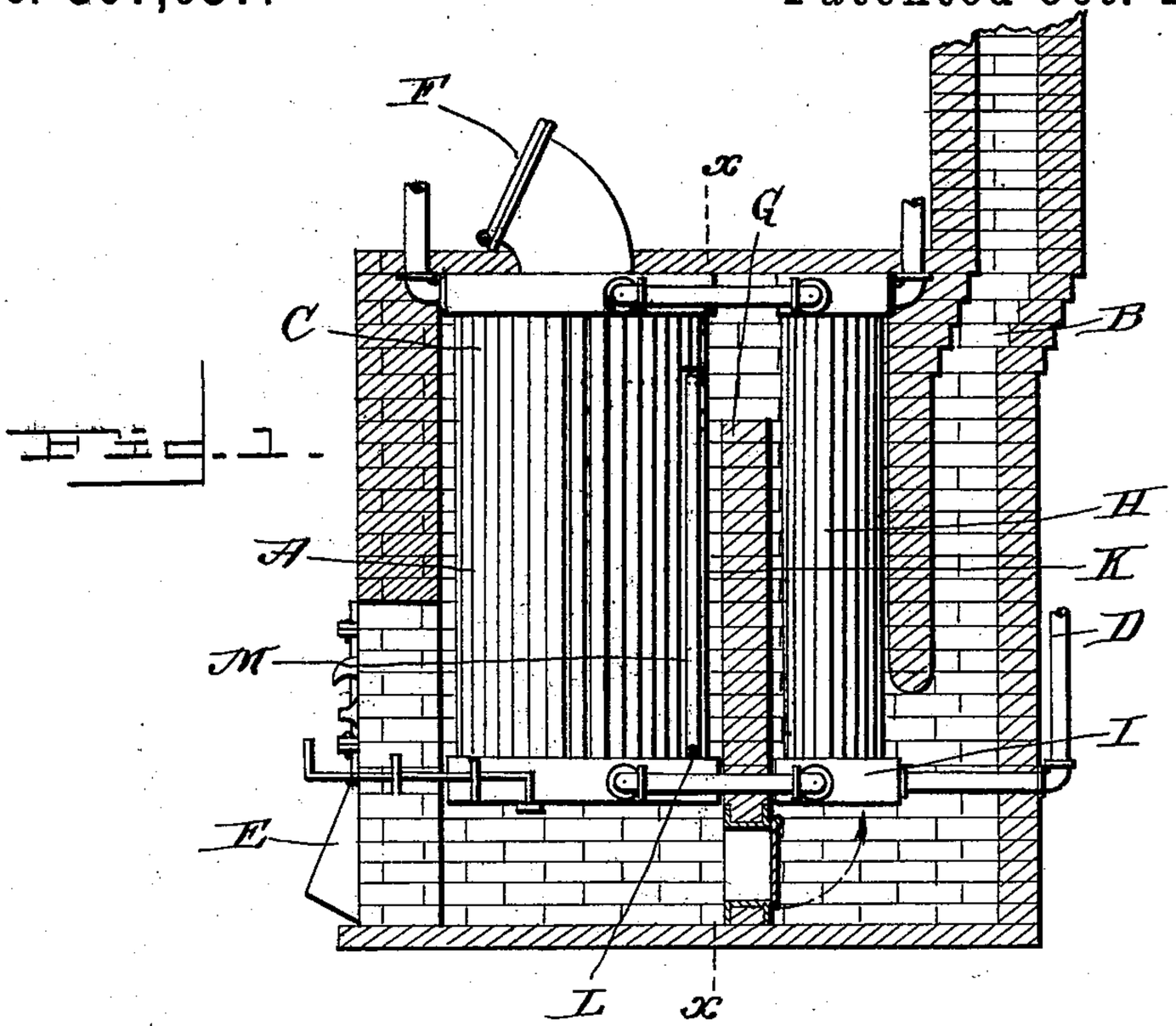

FIG. 1.

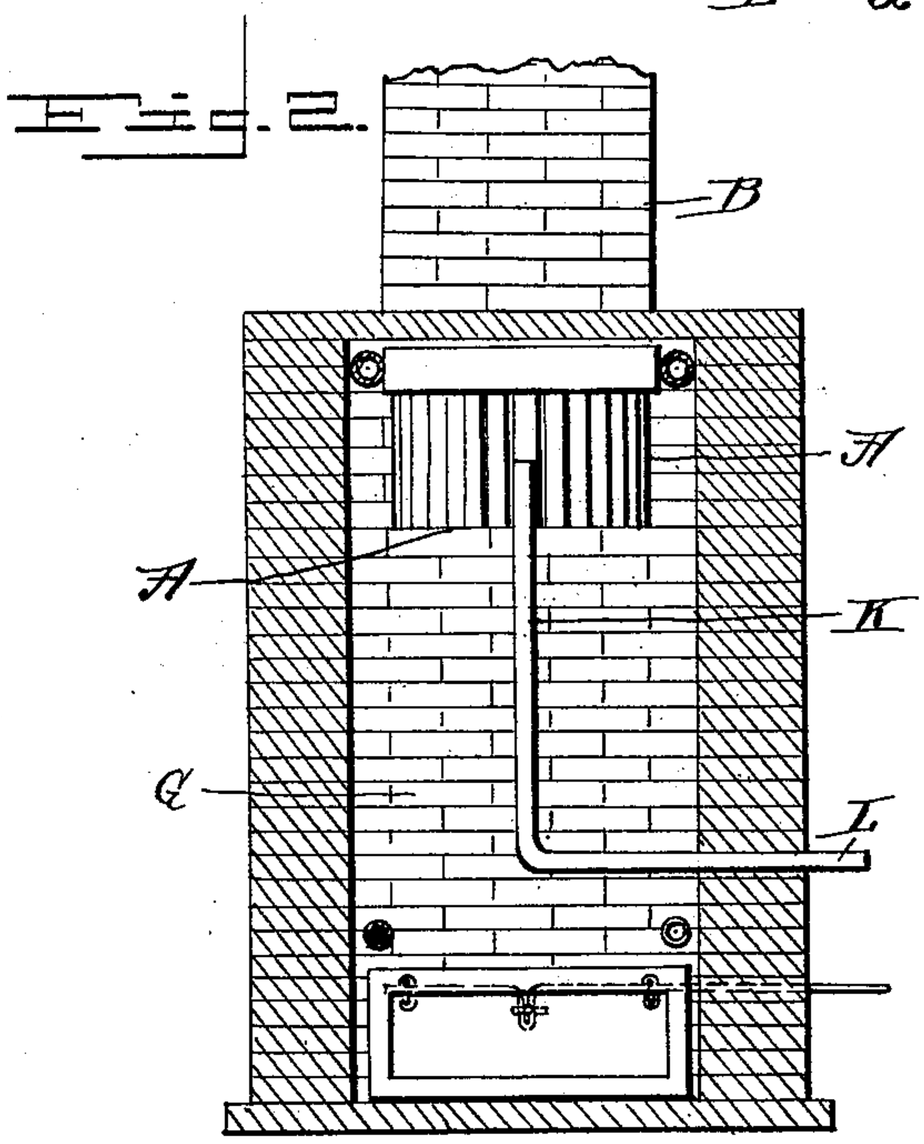

FIG. 2.

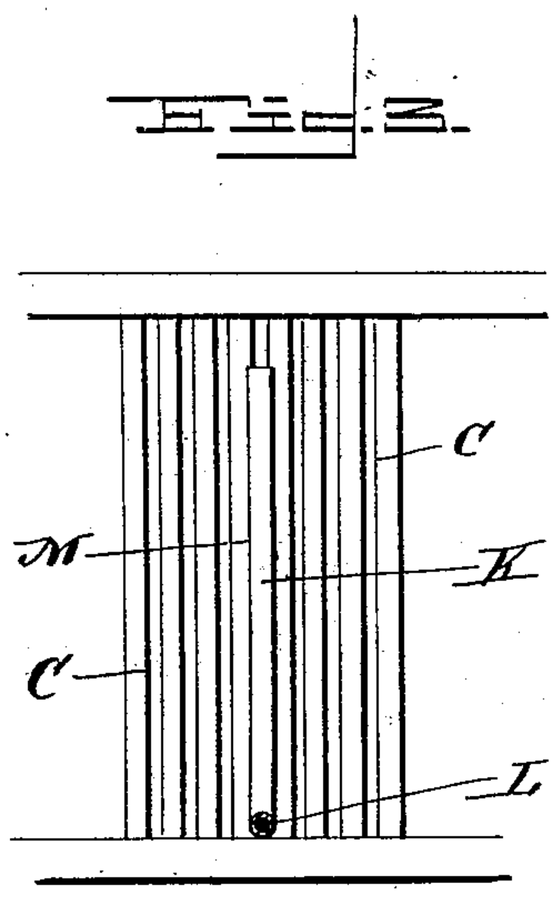

FIG. 3.

Witnesses
W. N. Dumphrey.
T. C. Harrington.

Inventor
Charles Phelps.
By Thos. J. Hitchcock Attorney

UNITED STATES PATENT OFFICE.

CHARLES PHELPS, OF OSKALOOSA, IOWA.

FEEDING AIR TO FURNACES.

SPECIFICATION forming part of Letters Patent No. 507,037, dated October 17, 1893.

Application filed January 21, 1893. Serial No. 459 143. (No model.)

To all whom it may concern:

Be it known that I, CHARLES PHELPS, a citizen of the United States, residing at Oskaloosa, in the county of Mahaska and State of Iowa, have invented a certain new and useful Improvement in Feeding Air to Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to steam or hot-water heaters and consists in providing means for admitting air to the products of combustion in the heating-chamber, whereby the soot and other imperfectly destroyed matter are entirely consumed.

My invention is illustrated in the accompanying drawings forming a part hereof, wherein—

Figure 1 is a vertical section of a conventional form of heater with my improvement applied thereto. Fig. 2 is a vertical section taken on the line *x*, *x*, of Fig. 1. Fig. 3 is a detail view.

Similar letters of reference refer to similar parts throughout the drawings.

The conventional form of heater illustrated in Fig. 1 consists of a suitable fire-pot, A, and chimney, B. Located in the fire-pot, A, are the usual vertical water-pipes, C, arranged so as to inclose the fire space. Water is supplied to the lower ends of the said pipes through supply-pipe, D, in any desired manner.

The heater is provided with the usual grate-draft, E, and fuel-supply opening, F. The products of combustion pass up through the fire-chamber, heating the water-pipes contained therein, then over a division-wall, G, down through an auxiliary chamber, H, and communicate with the chimney at the point, I.

With the ordinary draft through grate-draft, E, the soot, gases, and other products of combustion are only imperfectly consumed and are deposited on the pipes contained in the auxiliary chamber and in the chimney, soon causing a clogging and choking up of the passage-way for the said products of combustion, thus seriously interfering with, and preventing, a strong steady draft. Especially is this true where soft coal or other bituminous fuel is used. In this way there is a loss of heat, and, in a very short time, the efficiency of the heater becomes seriously impaired. To obviate this difficulty, I provide an elbow-pipe, K, preferably of wrought iron, which communicates with the outside air at one end and with the interior of the fire-pot at the other.

In the arrangement shown, the arm, L, (Fig. 2,) of the air-supply pipe communicates with the outer air at or near the base of the fire-pot, by being extended through a suitable hole in the heater casing. The arm, M, (Figs. 1 and 3,) of said pipe extends vertically parallel with the water-pipes and preferably so located as to be between and in contact with two of said pipes. Said air-supply pipe terminates in the fire-chamber a short distance above the top of the fuel. The location of the air-supply pipe is important for when between and in contact with the water-pipes, not only is the column of incoming air heated to the same degree of heat as the water-pipes, thus creating a draft of air, but also the air-supply pipe is prevented from being burned out by the intense heat of the burning fuel in contact with it and the mouth or open end of said pipe is removed from the path of the fuel when it is introduced to the fire-chamber thus preventing the liability of the said pipe getting choked up by pieces of coal or other matter falling therein.

It will be readily seen that a strong draft of air is created and maintained through the air-supply pipe by the ordinary chimney-draft and also by reason of the difference in temperature of the inner arm of said pipe and the outer end thereof. It will also be seen that this incoming column of air is heated to the same degree of temperature as the products of combustion. This column of air serves to introduce sufficient oxygen to thoroughly and completely consume the smoke, soot, and other products of combustion which are not consumed by the supply of air from the usual source through the grate-draft and fire.

I have shown my invention as applied to a conventional form of heater but it will be readily understood by any one skilled in the art that it is adapted to any form of heater where its services are desired; and, therefore,

I do not desire to limit myself to the exact form of heater shown and described; nor do I desire to limit myself to only one air-supply pipe as it will be readily understood that the number of such pipes depends upon the size of the heater and the kind of fuel employed; but

What I do claim as my own invention or discovery, and desire to secure by Letters Patent, is—

In a steam or hot water heater, a furnace chamber, a fire-pot formed by vertically arranged water tubes, and one or more air supply pipes having the lower ends thereof communicating with the outer air the opposite ends terminating above and adjacent the bridge of said furnace chamber and the intermediate portion running parallel with said water tubes and so located as to be partially inclosed thereby, as specified.

In testimony whereof I do affix my signature in presence of two witnesses.

CHARLES PHELPS.

Witnesses:
H. STRASBURGER,
ANNA PHELPS.