

No. 626,410.

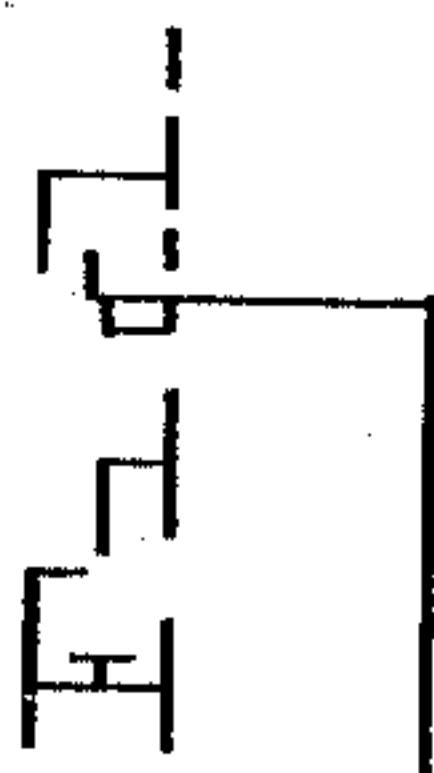
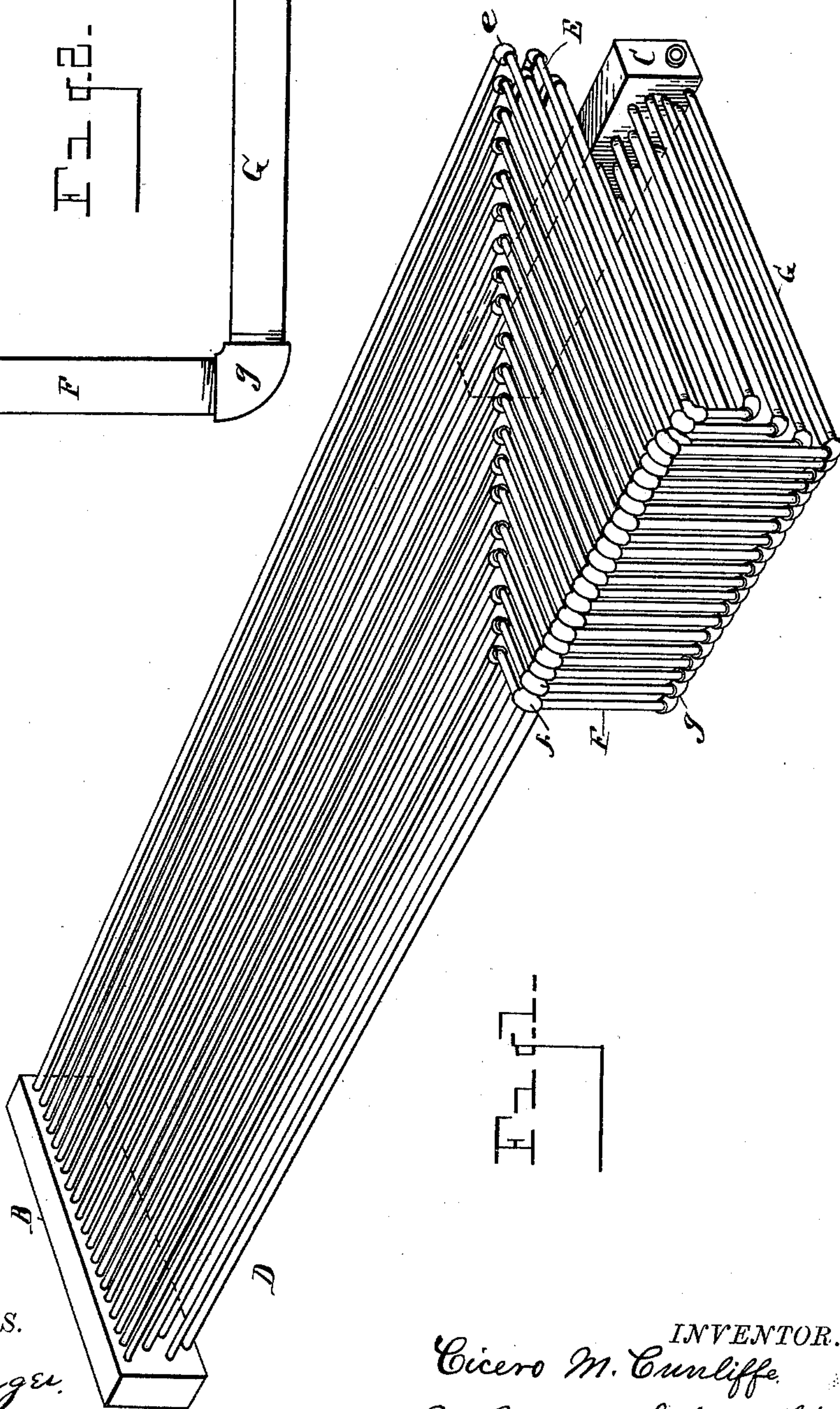
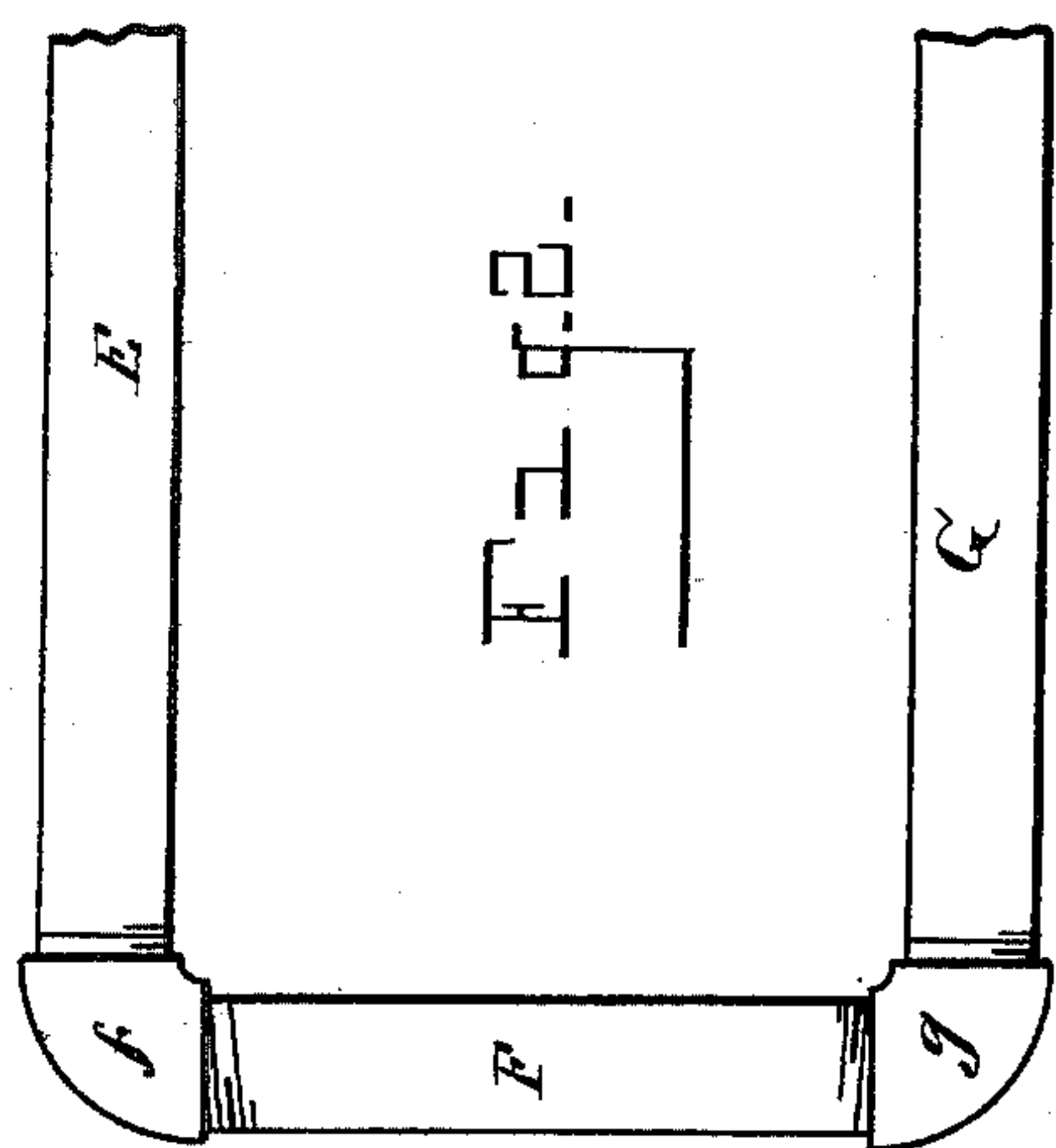
Patented June 6, 1899.

C. M. CUNLIFFE.
STEAM PIPES FOR HEATING DRY KILNS.

(Application filed May 31, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES.

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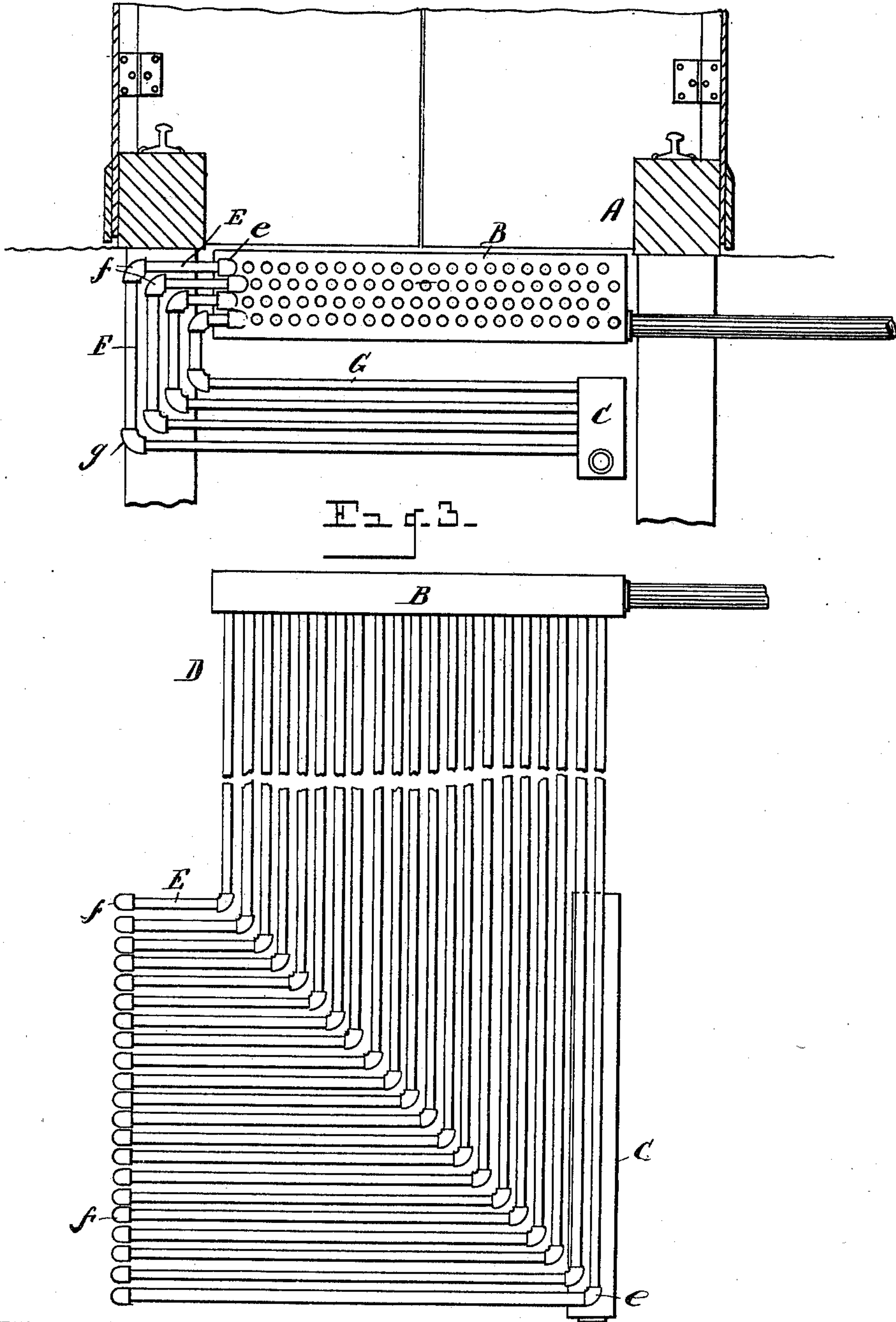
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2 Sheets—Sheet 2.



WITNESSES.

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UNITED STATES PATENT OFFICE.

CICERO M. CUNLIFFE, OF DETROIT, MICHIGAN, ASSIGNOR TO THE AMERICAN BLOWER COMPANY, OF SAME PLACE.

STEAM-PIPES FOR HEATING DRY-KILNS.

SPECIFICATION forming part of Letters Patent No. 626,410, dated June 6, 1899.

Application filed May 31, 1898. Serial No. 682,089. (No model.)

To all whom it may concern:

Be it known that I, CICERO M. CUNLIFFE, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Steam-Pipes for Heating Dry-Kilns; and I 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, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object a novel system and arrangement of steam-pipes for heating dry-kilns, the same being more particularly applicable for "moist-air" dry-kilns; and the invention consists of the structure, combination, and arrangement of devices hereinafter described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a view in perspective illustrating my invention. Fig. 2 is a detail view of certain portions of one of the sets of pipes. Fig. 3 is an end elevation showing portions of the pipe, other portions of the pipe being removed. Fig. 4 is a plan view.

The purpose of my invention, more specifically, is to provide a system and arrangement of steam-pipes for the purpose described to allow for expansion and contraction without straining any of the joints.

I carry out my invention as follows:

In the drawings, A represents any suitable inclosure for the kiln.

B denotes a steam header or manifold of suitable proportions to supply a sufficient amount of steam to keep all of the pipes hot.

C denotes a drip-header. This drip-header C is shown in the drawings arranged substantially at right angles to the longitudinal direction of the steam-header B, although I do not limit myself solely thereto. With the steam-header B is connected a suitable number of steam-pipes D, so arranged that the air in rising will come in contact with each of the pipes. Connected with the opposite extremities of the pipes D are a series of transversely-arranged pipes (indicated at E) connected with the pipes D, respectively. The pipes D

may be of any suitable length, but are preferably successively elongated the one beyond the other from one side of the series of pipes D to the opposite side of said series, while the pipes E are also preferably elongated one beyond the other from one side the series of pipes E to the other side of said series, as indicated in Figs. 1 and 4. The pipes D and E may be connected by any suitable pipe-unions, (indicated at *e*.) The pipes D and E are shown located in a horizontal position. The pipes E are also shown connected with a corresponding series of vertical pipes F, as by unions *f*.

With the series of pipes F is connected a corresponding series of pipes G, as by unions *g*, said pipes G shown extending horizontally and communicating into the drip-header C. The pipes F, as shown in detail in Fig. 2, are provided with right and left hand threads to engage the correspondingly-threaded unions *f* and *g*. These right and left hand vertical threaded pipes F practically constitute pivots, upon which may swing the corresponding pipes E and G, which are united to the vertical pipes F at right angles thereto. By such an arrangement and construction the pipes E and G can swing upon their connections with the corresponding pipes F under expansion and contraction without twisting the headers, inasmuch as thereby the pipes in expanding can stretch out readily without straining any of the joints. This system and arrangement of pipes, in connection with the headers, also provides for a drip-header to receive water of condensation at the bottom of the whole series of pipes at the back end thereof.

It is evident that under expansion and contraction the pipes D exert a leverage on the pipes E to turn them on the pivotal connecting-pipes F, while said pipes F are also permitted to turn in the unions *g*. Where the pipes D are made of considerable length, as indicated in the drawings, the expansion and contraction will amount to considerable. At the same time the pipes E will expand lengthwise, while the pipes G will also expand lengthwise, and both being at right angles to the pipes F and of substantially equal length the expansion of the two sets of pipes E and G

will carry the pipes F in a corresponding direction without straining the pipes.

What I claim as my invention is—

1. In a system of steam-pipes, a series of pivotal pipes, a series of pipes united to each extremity of said pivotal pipes and arranged to swing thereupon in the expansion and contraction of the pipes, and an additional series of pipes connected with one of the series of pipes united to the pivotal pipes and arranged to exert a leverage thereon under expansion and contraction, substantially as set forth.

2. In a system of steam-pipes, a series of pivotal pipes provided with right and left hand screw-threads at the extremities thereof, a series of pipes united to each extremity of said first-named pipes at substantially right angles thereto, and an additional series of pipes connected with one of the series of pipes united to the pivotal pipes and arranged to exert a leverage thereon under expansion and contraction, substantially as set forth.

3. In a system of steam-pipes, the combination with a steam header or manifold, of a series of steam-pipes D connected therewith, a series of pipes E connected with the pipes D, respectively, at an angle thereto, a series of pipes F connected with the series of pipes E, respectively, a series of pipes G connected with the series of pipes F, respectively, and a drip-header connected with the series of pipes G, the series of pipes E arranged to swing on the pipes F, and the series of pipes D arranged to exert a leverage on the pipes E under expansion and contraction, substantially as set forth.

4. In a series of steam-pipes, the combination with a steam header or manifold, of a series of steam-pipes D connected therewith, a series of pipes E connected with the pipes D, respectively, at an angle thereto, a series of pipes F connected with the series of pipes E, respectively, a series of pipes G connected

with the series of pipes F, respectively, at an angle thereto, and a drip-header connected with the series of pipes G, the series of pipes F serving as pivots upon which the pipes E and G may swing in the expansion and contraction of the pipes, the series of pipes D arranged to exert a leverage on the pipes E under expansion and contraction, substantially as set forth.

5. In a system of steam-pipes, the combination with a steam header or manifold, of a series of steam-pipes D connected therewith, a series of pipes E connected with the pipes D, respectively, at an angle thereto, a series of pipes F connected with the series of pipes E, respectively, a series of pipes G connected with the series of pipes F, respectively, at an angle thereto, and a drip-header connected with the series of pipes G, the series of pipes F having a right and left hand threaded connection with the unions connecting the pipes E and G therewith, the series of pipes D arranged to exert a leverage on the pipes E under expansion and contraction, substantially as set forth.

6. In a system of steam-pipes, a series of pivotal pipes, a series of pipes united to the upper extremity of the pivotal pipes at substantially right angles thereto, and an additional series of pipes united to the opposite extremities of the pivotal pipes at substantially right angles thereto, the upper series of pipes united to the upper extremities of the pivotal pipes having a swinging engagement upon the pivotal pipes, substantially as set forth.

In testimony whereof I sign this specification in the presence of two witnesses.

CICERO M. CUNLIFFE.

Witnesses:

N. S. WRIGHT,
MARY HICKEY.