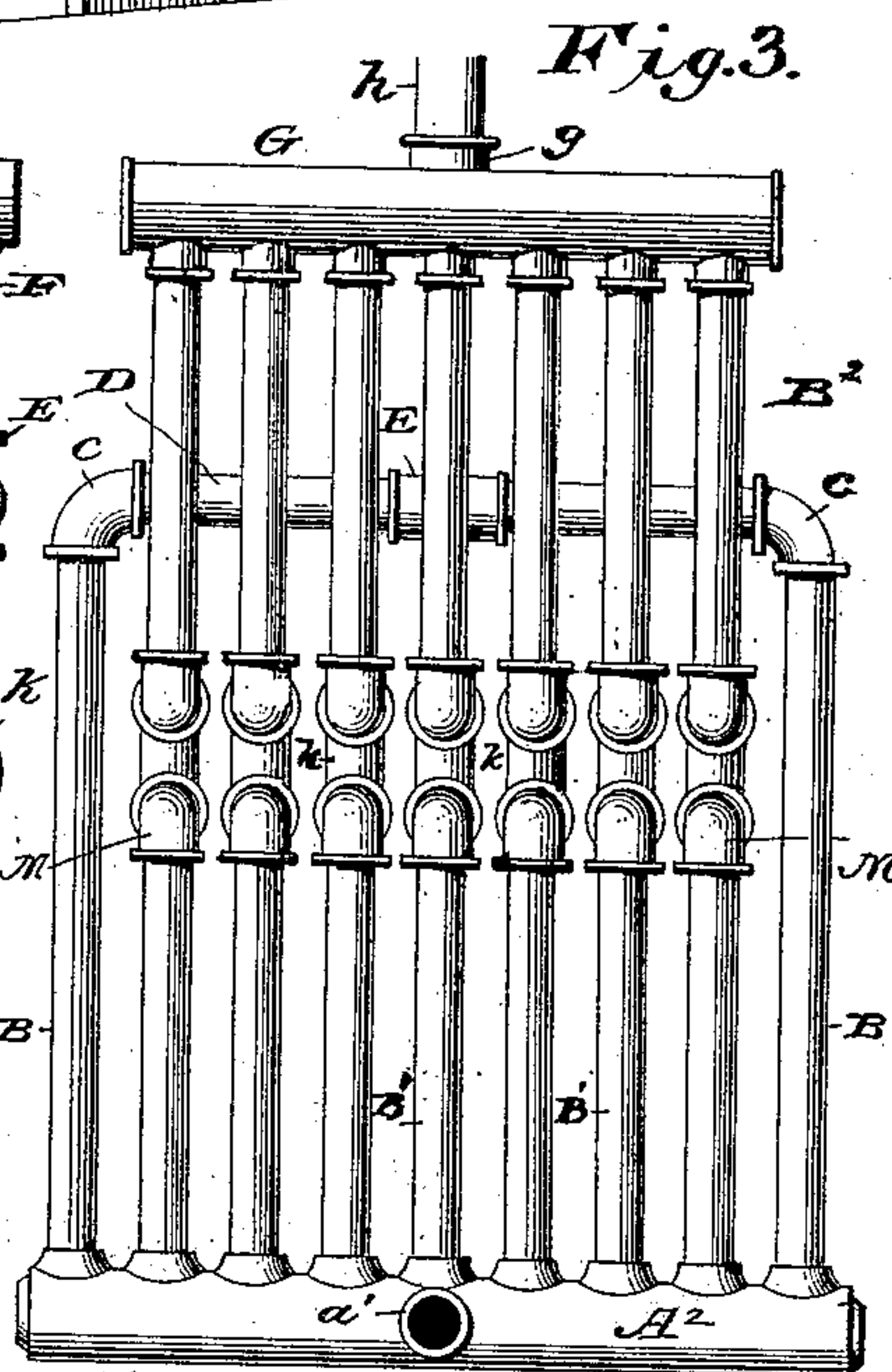
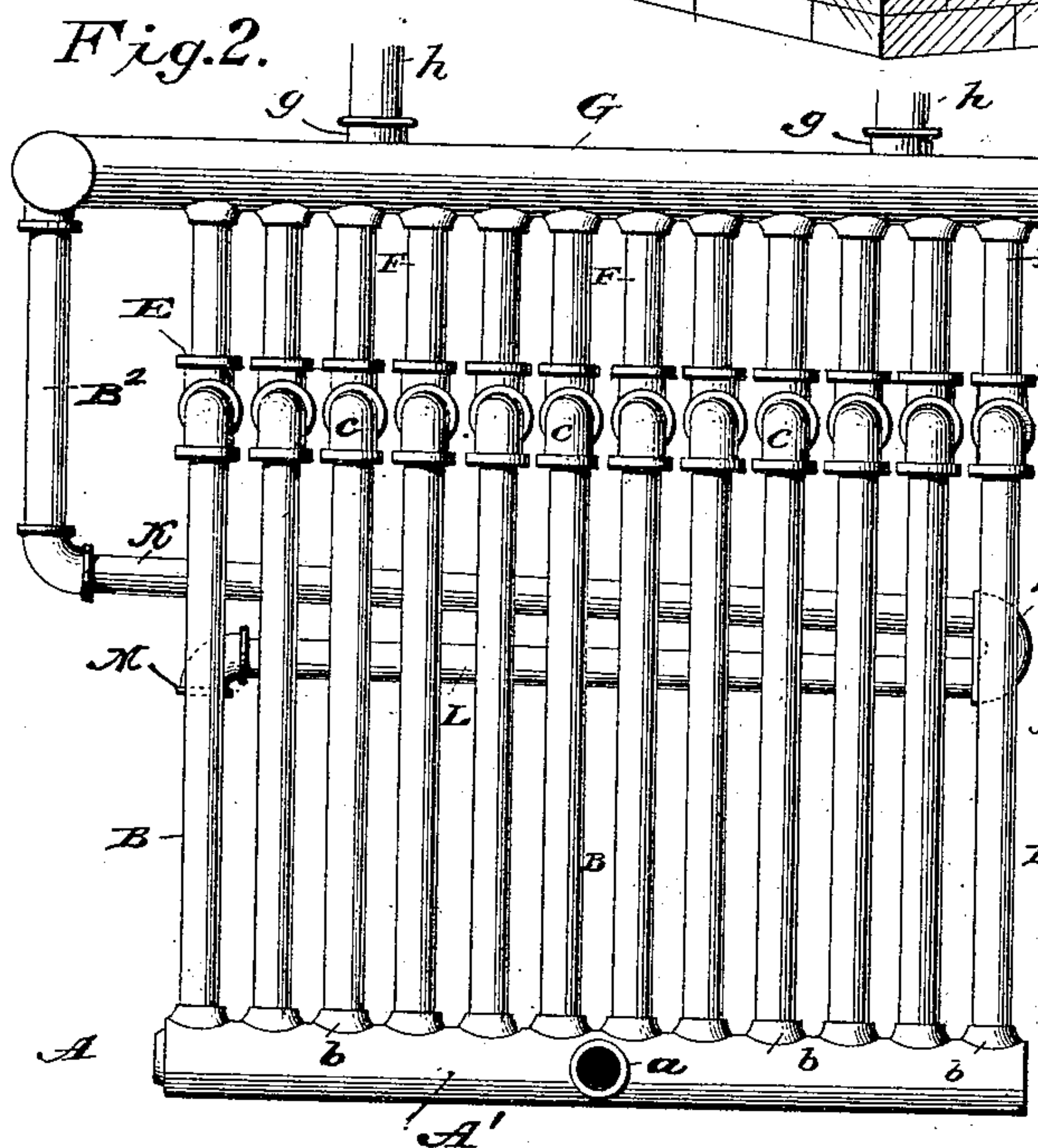
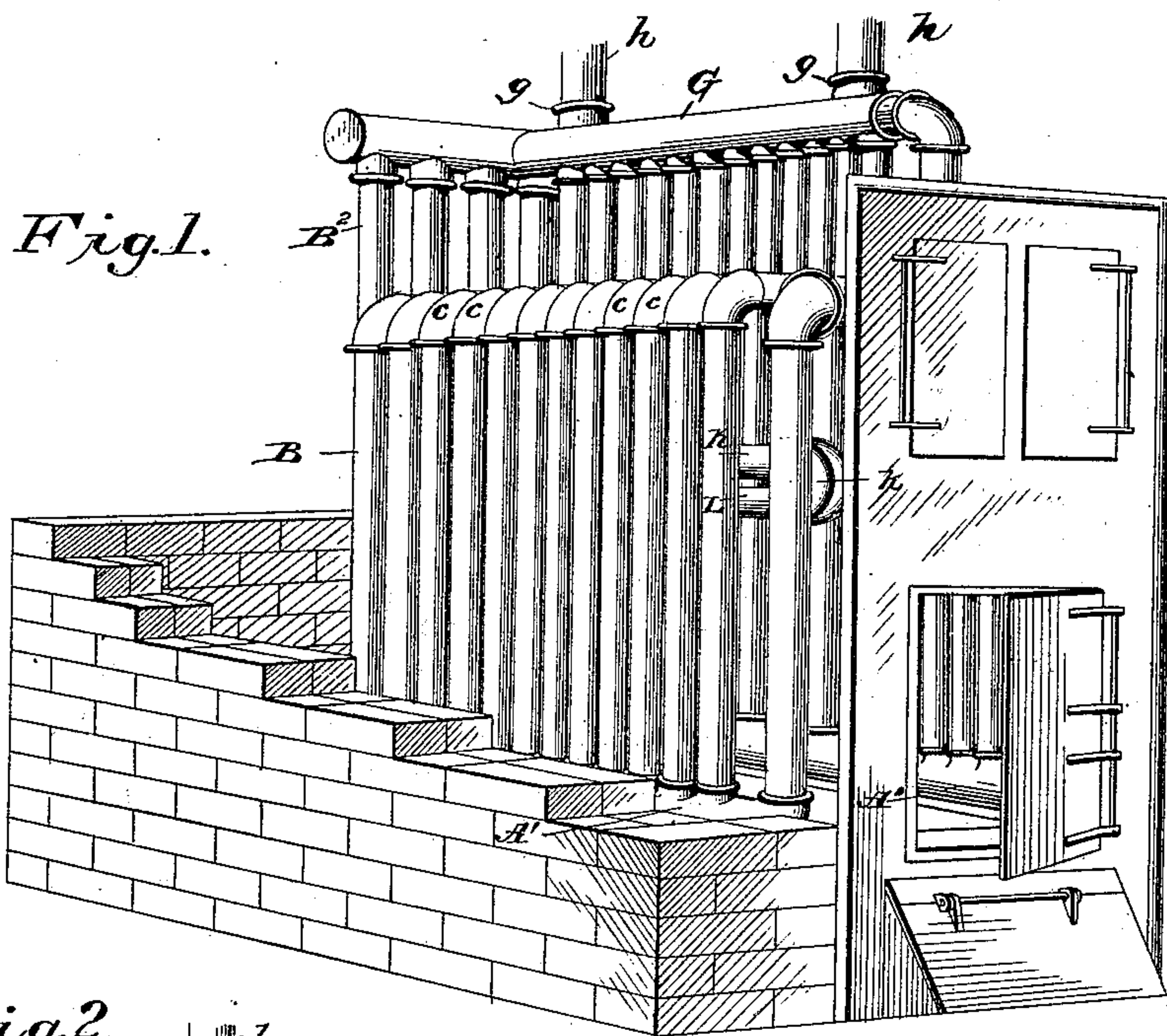


(No Model.)

W. MALTBY & J. D. WALLACE.
WATER HEATING APPARATUS.

No. 437,495.

Patented Sept. 30, 1890.



Warren Maltby
Joseph D. Wallace.
Inventors

Witnesses
L. S. Elliott.
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by *[Signature]*
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UNITED STATES PATENT OFFICE.

WARREN MALTBY AND JOSEPH D. WALLACE, OF CHAMPAIGN, ILLINOIS.

WATER-HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 437,495, dated September 30, 1890.

Application filed April 30, 1890. Serial No. 350,057. (No model.)

To all whom it may concern:

Be it known that we, WARREN MALTBY and JOSEPH D. WALLACE, citizens of the United States of America, residing at Champaign, in the county of Champaign and State of Illinois, have invented certain new and useful Improvements in Water-Heating Apparatus; and we 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in water-heating apparatus.

The object of the invention is to provide a water-heating device or boiler which will be mainly made up of tubes and couplings, which are so arranged as to line the sides, rear, and top of the fire-chamber, the parts being constructed and combined substantially as shown, and as will be hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a perspective view; Fig. 2, a side elevation, and Fig. 3 a rear elevation.

A refers to the base-casting, which consists of two side pieces A' and a rear end piece A², the side castings being attached to the rear casting in any suitable manner, or formed of a single piece, if desired. The side pieces are provided with internally-screw-threaded openings *a* and the end piece with a similar opening *a'*, to which the supply or blow-off pipes may be joined. The base-casting A is provided at its upper portion with a series of internally-screw-threaded openings *b* for the reception of the vertical side pipes B and rear end pipes B'. The vertical side pipes B are each provided with elbows *c c*, to which are attached short sections of pipes D, which are connected to central T-joints E, in the vertical members of which are secured the lower ends of vertical pipes F, the upper ends of said pipes being secured to a casting G, which has internally-screw-threaded openings therefor, and near its ends openings *g* for the reception of circulating-pipes *h h*, as shown. The upper or top casting G at its rear end has a transverse member, on the under side

of which are a series of threaded openings for the reception of pipes or tubes B², which are connected by elbows to a series of tubes K, having return-elbows *k*, which are connected by pipes L, elbows M, and lower vertical pipes B' to the portion A² of the casting A.

By this construction we provide a furnace which has rear, side, and top walls or tubes and intermediate projecting pipes over the grate, which connect directly with the upper and lower castings, and the casting through which the supply passes is located centrally above the grate. In this manner the full benefit of the heat is obtained, and the major portion of the furnace is made up of straight pipes and elbows.

We are aware that prior to our invention it has been proposed to provide a furnace made up of a hollow base, pipes connecting the same to an upper casting, and pipes which project above the grate; and we do not therefore wish to be understood as broadly claiming the same. We are also aware of the construction disclosed in the patent of Kelsey, No. 417,325, dated December 17, 1889, and that of Mouat, No. 408,249, dated August 6, 1889. Our invention will be readily distinguished from the constructions alluded to, in that we form a construction entirely made up of tubes and bends, wherein the construction lines the incasing portion at the sides and rear, the pipes K L being located to receive the effective action of the heat, and ample space arranged above the same to permit the heat to act on the top portions of the structure. The construction, moreover, is exceedingly cheap, and all the pipes are easily accessible for the purpose of replacing or tightening the same.

Having thus described our invention, we claim—

1. In a water-heating apparatus, a casting A, comprising side section A' and end section A², each having at its upper edge a series of screw-threaded openings, vertical pipes B and B', secured at their lower ends to said sections of the casting, the pipes B having elbows *c*, transverse connecting-pipes D, and T-couplings E, for the reception of central vertical pipes F, which are connected to the central longitudinal casting G, pipes B², connecting casting G to pipes K and L, which form a return-bend and connect with casting

A² by short vertical pipes B', the parts being organized substantially as shown, and for the purpose set forth.

2. In a water-heating apparatus, the surrounding casing containing a casting A, consisting of side pieces A' and rear transverse portion A², having openings *a a* and *a'* for connecting thereto supply-pipes, a series of vertical pipes connected to said base and communicating centrally over the grate by means of transverse pipes and couplings with vertical pipes and a central longitudinal casting, said central longitudinal casting having a transverse end member, a series of interme-

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diate pipes having return-bends connecting the casting G with the rear portion A² of the base A, and egress-openings *g* in the upper casting G, the parts being combined and organized substantially as shown, and for the purpose set forth. 20

In testimony whereof we affix our signatures in presence of two witnesses.

WARREN MALTBY.
JOSEPH D. WALLACE.

Witnesses:

F. D. RUGG,
GEO. F. BEARDSLEY.