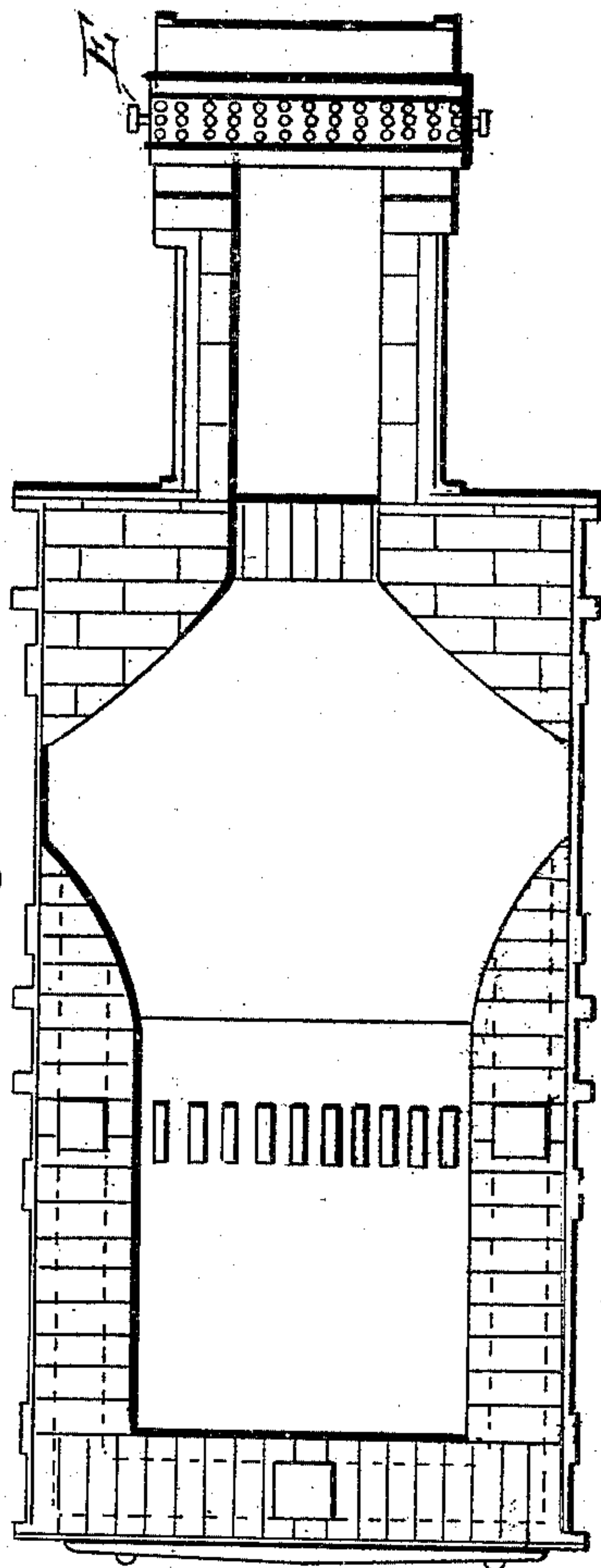
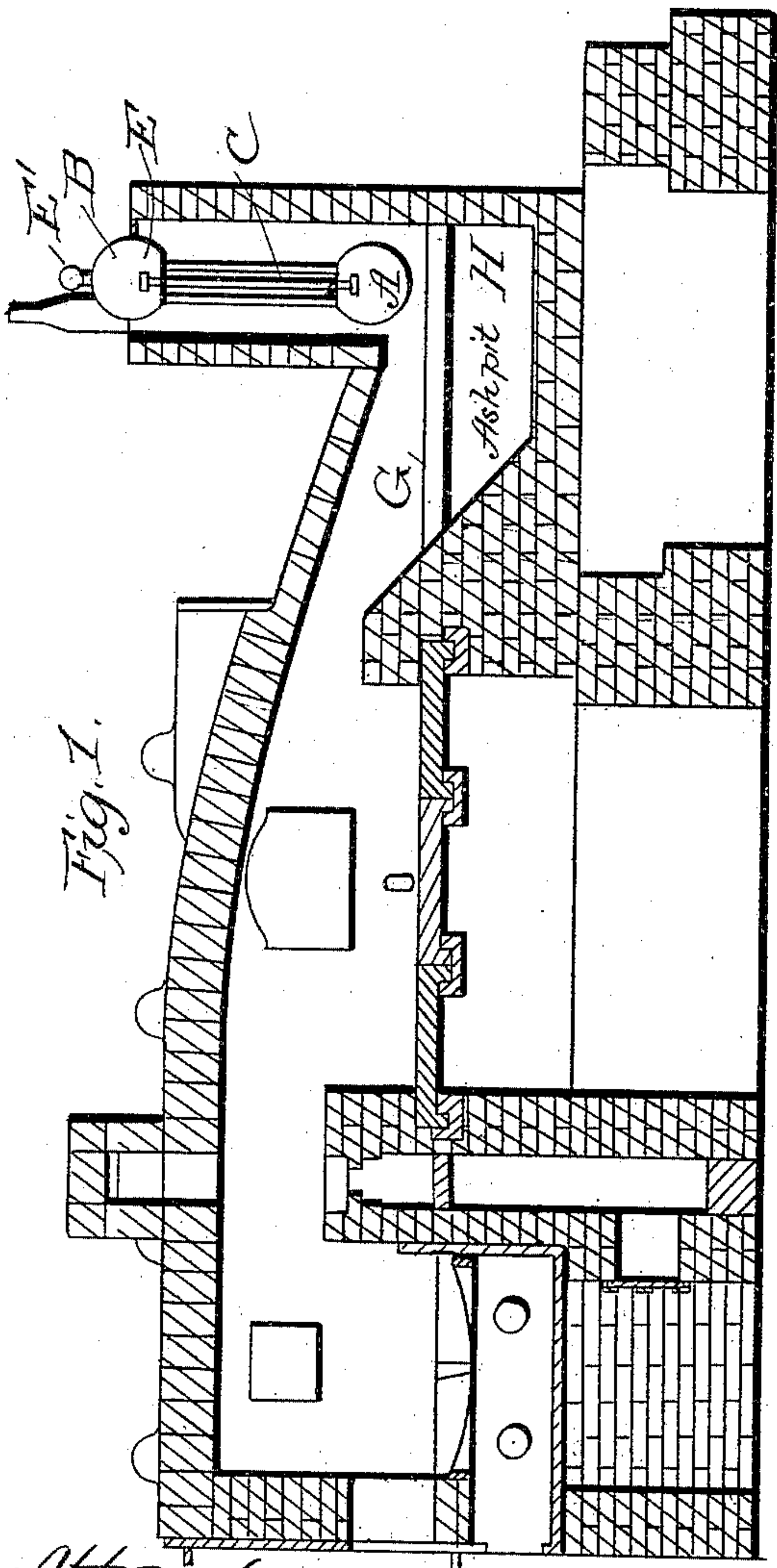
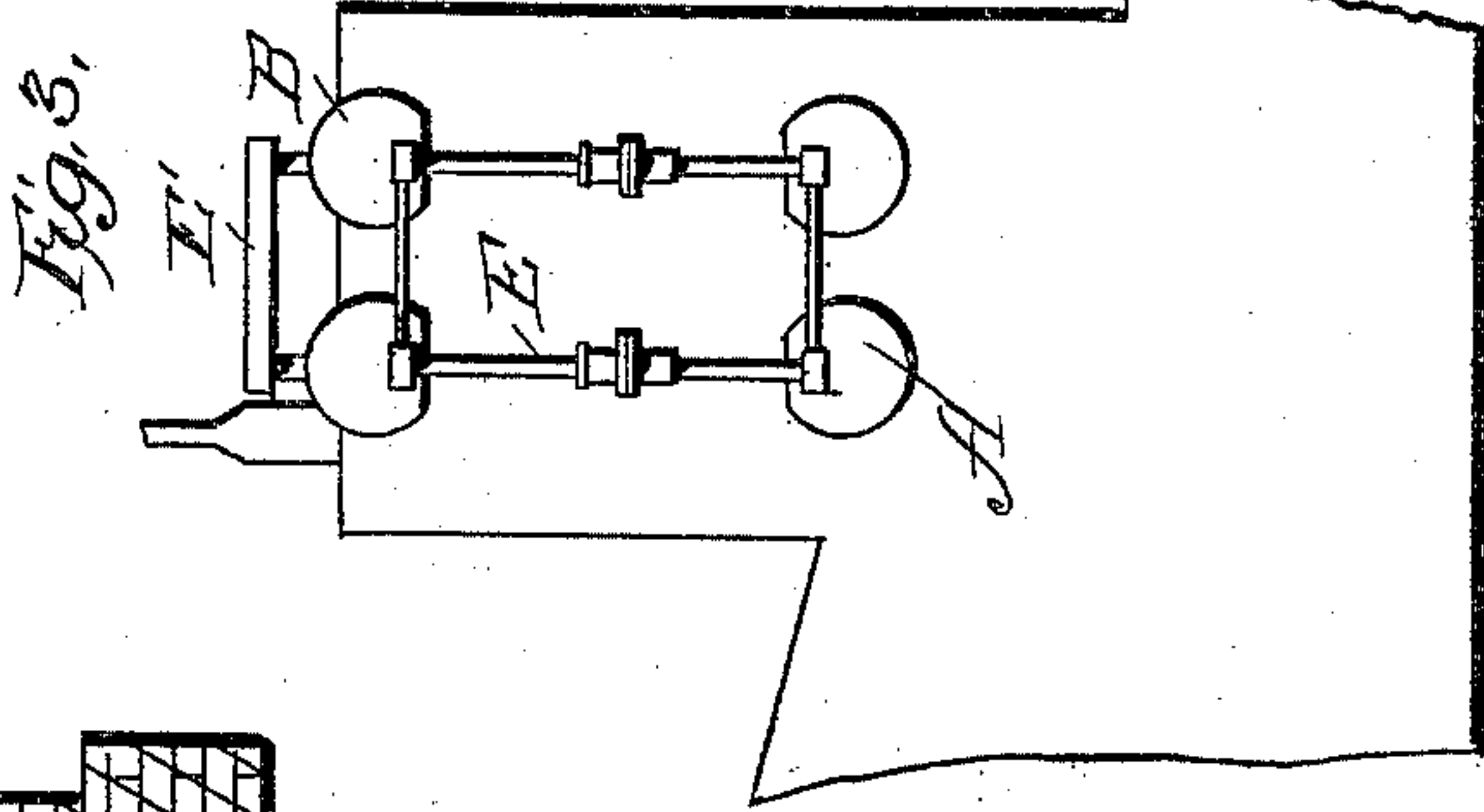


(No Model.)

E. A. WHEELER.
BOILER AND BOILER FURNACE.

No. 489,725.

Patented Jan. 10, 1893.



Attest
Matters building
F. L. Middleton

Inventor
E. A. Wheeler
by Ellis Spear
Att'y

UNITED STATES PATENT OFFICE.

EARL A. WHEELER, OF SHARON, PENNSYLVANIA.

BOILER AND BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 489,725, dated January 10, 1893.

Application filed November 10, 1891. Serial No. 411,537. (No model.)

To all whom it may concern:

Be it known that I, EARL A. WHEELER, a citizen of the United States of America, residing at Sharon, in the county of Mercer and State of Pennsylvania, have invented certain new and useful Improvements in Boilers and Boiler-Furnaces, of which the following is a specification.

In an application filed by me on the 7th day of March 1891, No. 384,088, I illustrated in connection with an improved construction of furnace a novel construction of boiler, though no claim was made for the boiler in said application.

The present application has for its subject a certain location of said boiler relative to a heating, puddling, or other furnace for utilizing the waste heat to generate steam.

The invention also consists of certain details of construction and arrangement.

In the accompanying drawings Figure 1 represents a sectional view of a puddling furnace with my improved boilers arranged in the draft stack at the rear. Fig. 2 is a plan view. Fig. 3 is an elevation of the boilers with a part of the furnace.

My improved boiler consists of upper and lower boilers singly or in series connected by a stack of vertical pipes and adapted to be heated in any suitable and improved manner. The series of boilers are connected by circulating pipes which are located outside the front wall of the furnace, being connected with the upper and lower sets of boilers so as to provide perfect circulation and permit of the flow of the water of condensation carried by the steam to the upper sets of boilers to the boilers of the lower set. The ends of the boilers extend outside of or on a line with the outer face of the brickwork, and thus are readily accessible and by removing the heads the stacks of pipes may be easily reached for cleaning, repair, or like purpose. The boilers of the lower set are shown at A, those of the upper set at B, the stacks of pipes at C, and the circulating pipes at E. A steam drum E', is in connection with each boiler of the set.

In order to utilize the waste heat of a heating or puddling furnace I arrange my boiler in the stack at the rear of the furnace and while I have shown but a single lower boiler and a single upper boiler in Fig. 1 it will be obvious that the stack may be of sufficient size to provide for a series of upper and lower boilers as in Fig. 3. The stack is preferably of brickwork of a height equal to or a little less than that of the boiler, forming a space around the boiler to permit the heating of every part of it except the extreme upper part of the upper boiler. The stack is closed at its upper end and is continued at one side of the boiler by an extension in the shape of an iron stack or a contracted brick stack as desired so as to provide ample draft. As the products of combustion and the waste heat pass out at the chimney it encircles and contacts with the boilers and the stacks of pipes with the result of imparting heat thereto and thus serving to generate steam. In order to supplement this waste heat I provide a space at the rear of the furnace in which I place a set of grate bars G and beneath the grate bars I form an ash pit H so that a fire can be built and this be utilized in connection with the waste heat or at times when the furnace is not in operation.

I claim as my invention:

In combination with a heating or puddling furnace the generator A, located entirely within the stack of the furnace, the generator B, at the mouth of said stack, vertical tubes connecting said generators, the said stack having its upper end closed about the upper generator, and a supplemental chimney or stack arranged alongside of the upper generator, substantially as described.

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

EARL A. WHEELER.

Witnesses:

G. W. SHILLING,
A. W. WILLIAMS.