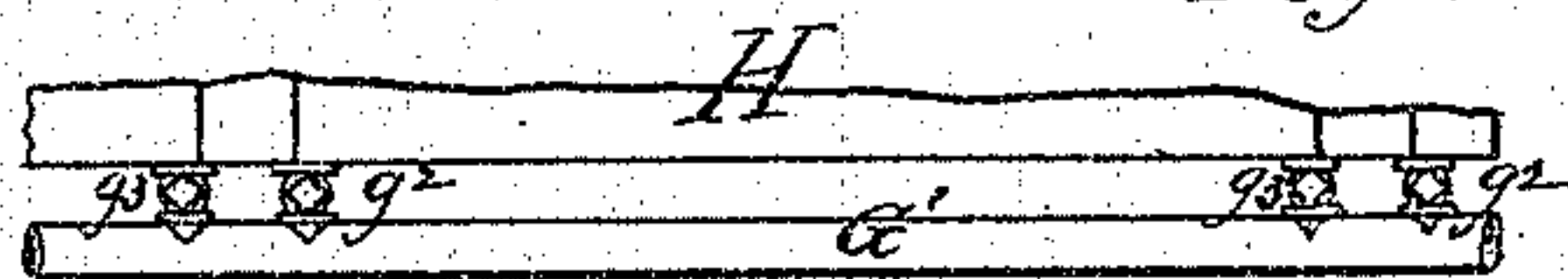
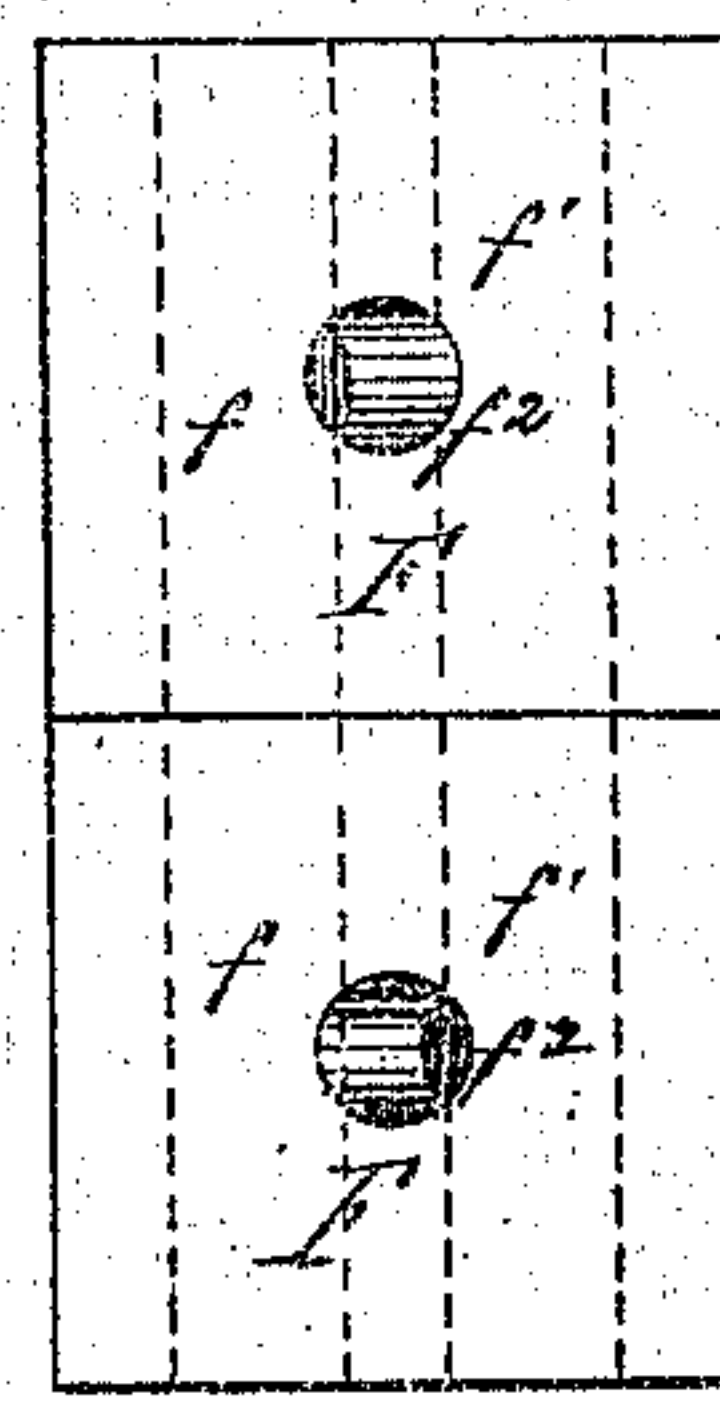
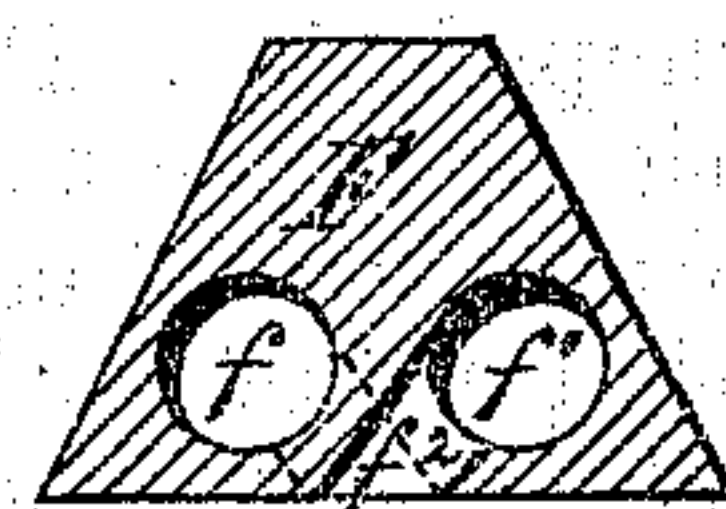
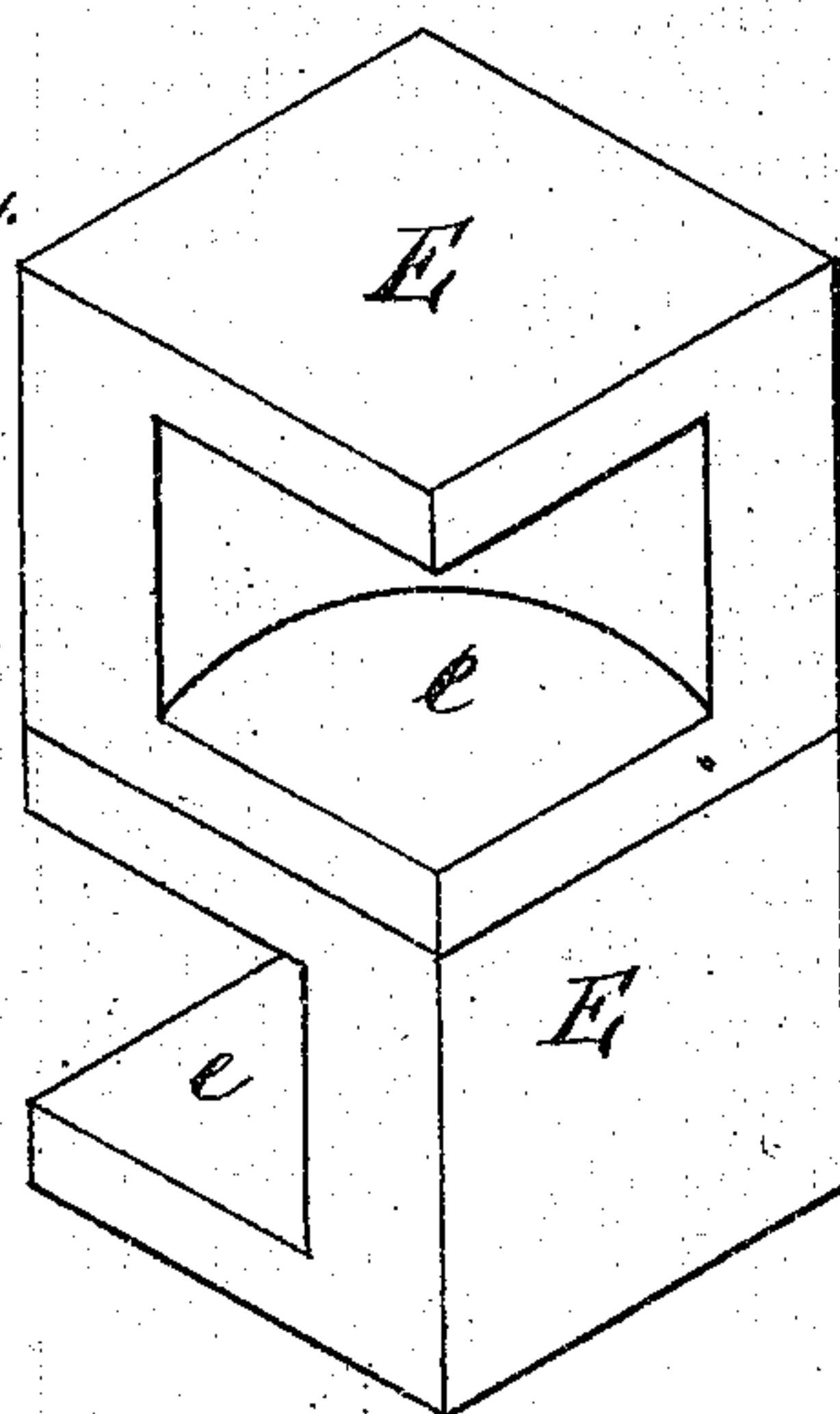
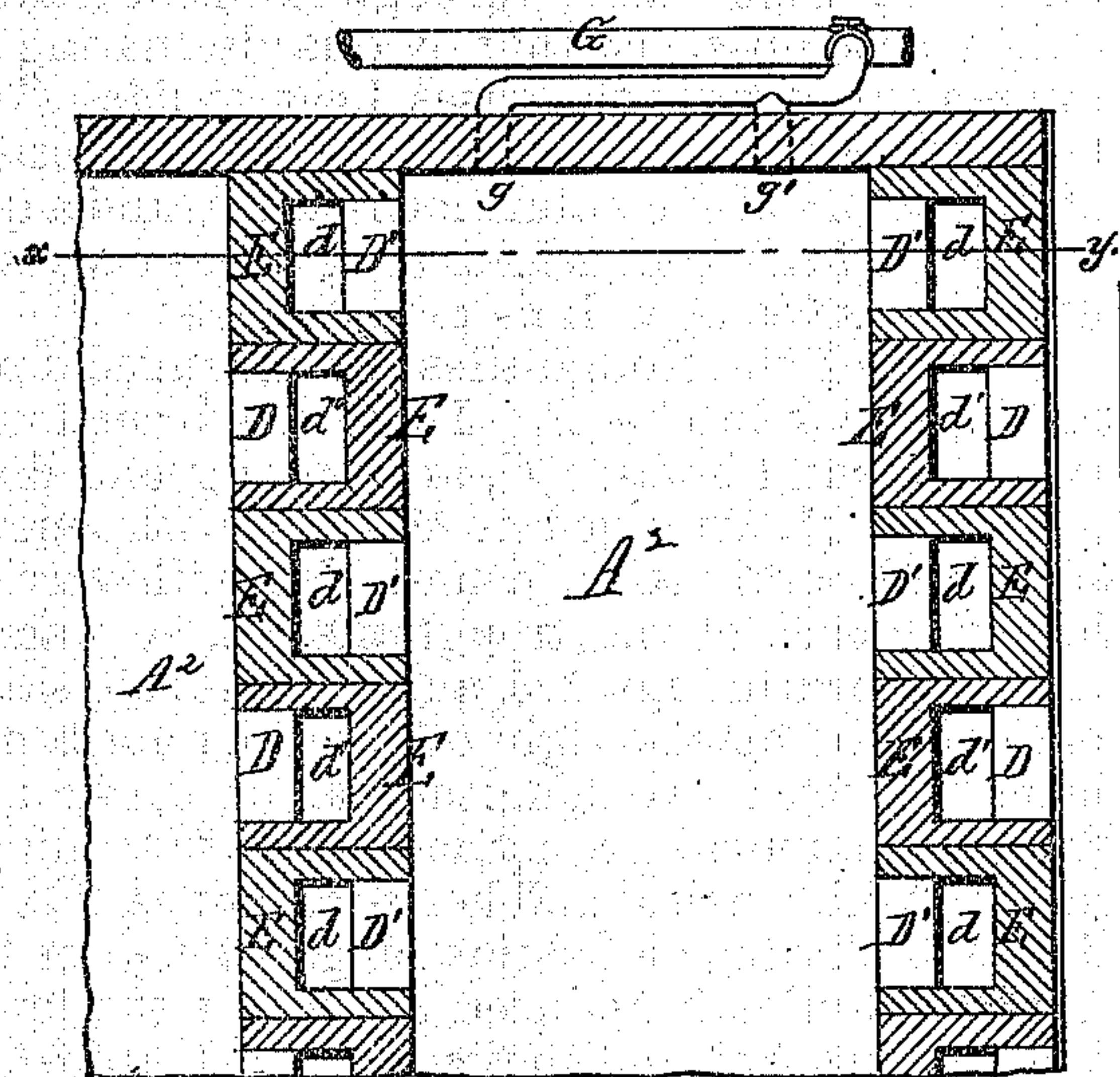
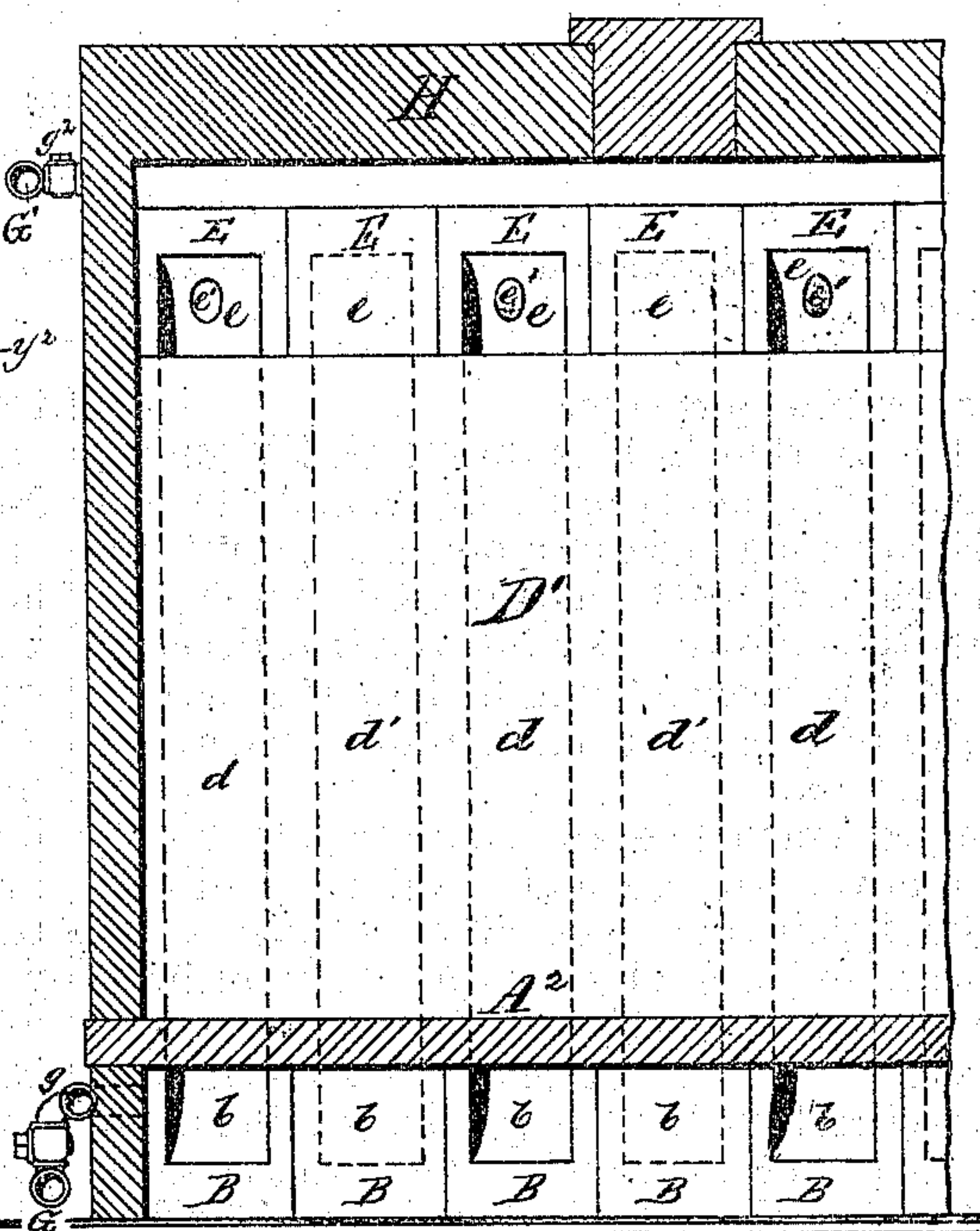
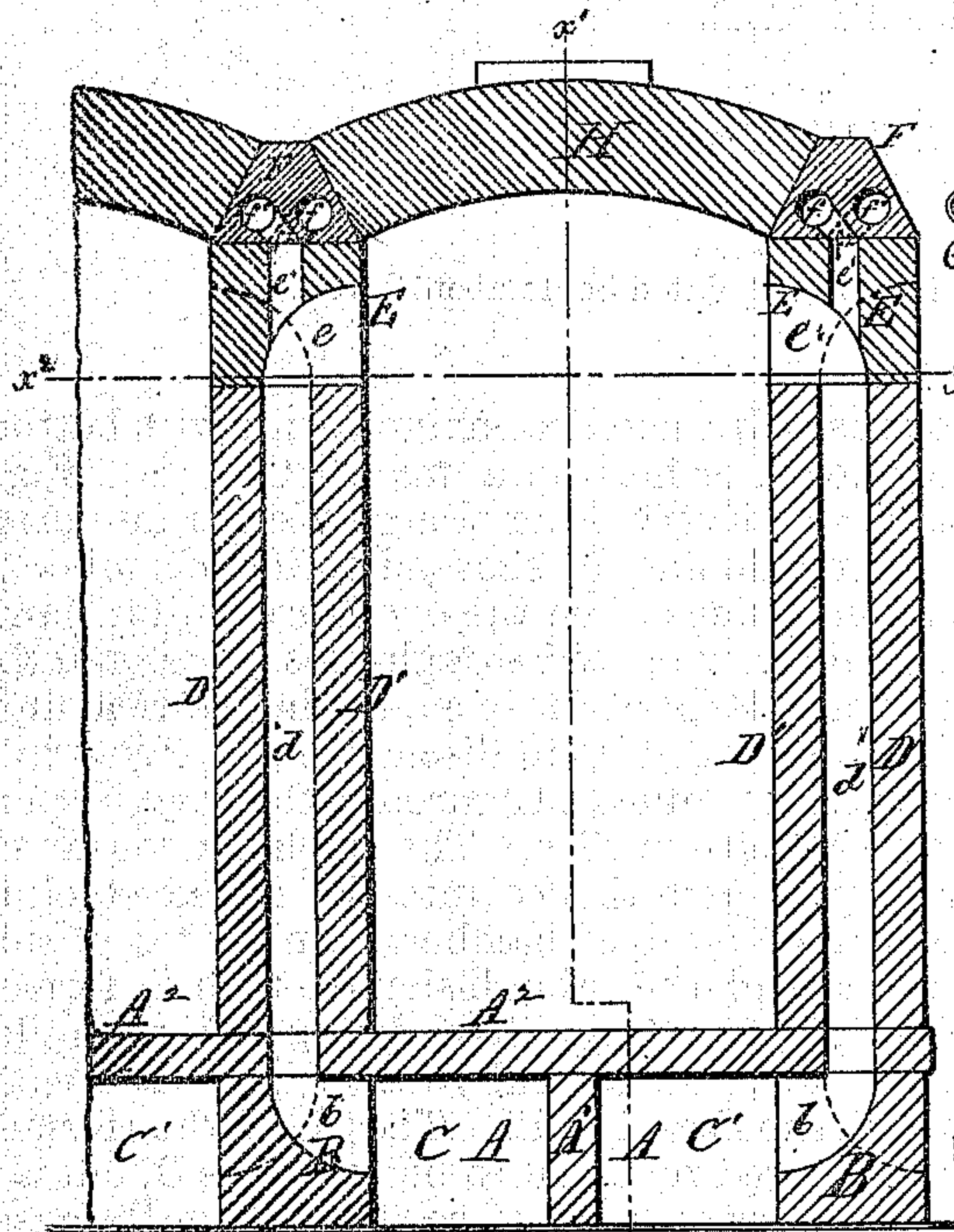


THEODORE G. MEIER.  
Improvement in Coke Ovens.

119,092.

Patented Sep. 19, 1871.



Witnesses:

Robert Burns.

L. M. Herbert.

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# UNITED STATES PATENT OFFICE.

THEODORE G. MEIER, OF ST. LOUIS, MISSOURI, ASSIGNOR TO ADOLPHUS MEIER & CO., OF SAME PLACE.

## IMPROVEMENT IN COKE-OVENS.

Specification forming part of Letters Patent No. 119,092, dated September 19, 1871.

*To all whom it may concern:*

Be it known that I, THEODORE G. MEIER, of St. Louis, in the county of St. Louis and State of Missouri, have made certain new and useful Improvements in Coke-Ovens; and I do hereby declare that the following is a full and true description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

The improvements herepresented relate: First, to such a novel arrangement of vertical and horizontal flues that each oven gives as well as receives heat, and whereby the gases are utilized and the generated heat is equally distributed to all parts of the oven. Secondly, to a peculiarly-constructed right or left trough-shaped tile, forming the upper and lower inlet and outlet connections with vertical and horizontal flues. Thirdly, in forming a skew-back tile with two horizontal holes and one diagonal hole or flue, whereby said tile is also made right or left in combination with trough-shaped tile. Fourthly, in arranging, in combination with vertical and horizontal flues, a system of pipes to aid combustion of gases by the introduction of cold or hot air or steam; the arrangement and construction of all said parts being such that every oven can be operated separately or independent of adjoining ovens, and all of which will now be more fully described.

To enable those herein skilled to make and use my said improvements I will now more fully describe the same, referring to the accompanying Figure 1 as a transverse sectional elevation at line  $xy$ ; Fig. 2 as a longitudinal sectional elevation at line  $x^1y^1$ ; Fig. 3 as a top sectional plan at line  $x^2y^2$ ; Fig. 4 as a perspective of trough-shaped tiles, showing reversed position of troughs in every other tile; Fig. 5 as a detail sectional elevation of skew-back tile; Fig. 6, detail bottom plan of same; Fig. 7, detail top plan of blast-pipe arrangements.

The oven is built on a solid foundation, the top of which is fire-brick. The sides or walls of the bottom chamber A consist of trough-shaped tiles B. Said tiles B are formed with troughs  $b$ . (See Figs. 1, 2, 3, and 4.) The bottom chamber A has horizontal flues C C', formed by the division-wall A<sup>1</sup>, upon the top of which the tile-floor A<sup>2</sup> is built. The said bottom floor A<sup>2</sup> of the coke-chamber may also be formed like an arch. In either case the trough-shaped tiles B are arranged with their

troughs  $b$  alternately communicating with bottom chamber A or horizontal flues C C'. (See Figs. 1 and 3.) Every other trough-tile B thus forms an open side flue for each adjoining chamber or horizontal flues when the ovens are built in pairs. Upon the row of said trough-tiles B are built the side walls D D' of the oven, having vertical flues  $d d'$  so arranged as to discharge the gases into the horizontal flues C C' through the trough-openings  $b$  of bottom tiles. The smoke or consumed gases pass from thence into the smoke-stack in the rear of bottom chamber. On the top of side walls are placed trough-shaped tiles E, formed with right or left troughs  $e$ , similar to bottom tiles B, but having a central vertical hole or flue,  $e'$ , as shown in Figs. 1 and 2. The tiles E thus formed are arranged reversed to bottom tiles B, but in a similar alternate manner, so as to receive the gases from the oven and conduct them through vertical flues  $d d'$ ; from thence through horizontal flues.

It will be observed that by this alternating arrangement of flues the gases, heat, or flames collect and completely envelop the sides and bottom of the oven; also combustion is aided, and a utilization of heat from neighboring ovens occurs as each flue gives as well as receives heat.

On top of the trough-tiles E is arranged a row of skew-back bricks, F. These are formed with two horizontal holes,  $f f^1$ , and having one diagonal hole,  $f^2$ , arranged to connect with one of said horizontal holes,  $f$ , and also with vertical hole  $e'$  in each of the trough-tiles E, in manner clearly shown in Figs. 1, 5, and 6. The said skew-back tiles being also right or left, their horizontal holes  $f f^1$  form two longitudinal or continuous flues, communicating, by means of their diagonals  $f^2$ , with vertical and horizontal flues. In order to facilitate combustion of gases cold or hot air, or steam, is introduced in each of the longitudinal flues  $f f^1$ , and similarly in the bottom horizontal flues C C'. For this purpose main pipes G G' are arranged in front or end of the oven, connecting, by branch pipes  $g g^1$ , with horizontal flues C C', and also connecting, by branch pipes  $g^2 g^3$ , with longitudinal flues  $f f^1$ , in manner indicated in Figs. 2, 3, 7. As, therefore, the cold or hot air, or steam introduced is also, by means of the diagonal flues  $f^2$ , forced in the vertical flues  $d d'$ , a complete combustion is insured, the heat generated being utilized before it passes into the smoke-stack. Each of the branch pipes  $g g^1 g^2 g^3$



has proper stop-cocks; thus the combustion of the gases is under the control of the operator, and every oven can be shut off separately without interfering with the working of the adjoining ovens.

The said system of pipes is operated either by suction or blast. The arch top H is built on top of skew-back bricks, and has proper opening, in which coal is charged in the coke-chamber. The door in front may be arranged to work in slides, or raised or lowered by chains connecting with a hoisting apparatus, or swung on hinges at the sides or top. When the coke is well baked it may be drawn or forced out of the oven by a steam-engine, as ordinary. The oven can readily be repaired. The construction is simple, cheap, and durable.

Having thus fully described my said improvements, what I claim and desire to secure by Letters Patent, is—

1. The arrangement and combination of horizontal flues C C' and vertical flues d d' to collect the gases, aid combustion, and extract heat and distribute the same to sides and bottom of the oven, substantially as and for the purpose set forth.

2. The alternate arrangement of vertical flues d d', by means whereof each oven gives and receives heat and each oven can be worked sepa-

ately of its neighbors, in combination with horizontal flues C C', substantially as shown and described.

3. The trough-shaped tile B having trough b, substantially as set forth.

4. The trough-shaped tile E having trough e and vertical hole e', substantially as set forth.

5. The trough-shaped tiles B and E, constructed as described, and arranged to serve as inlet to vertical flues d d' or outlet to horizontal flues C C', substantially as and for the purpose set forth.

6. The right or left skew-back tile F, having longitudinal holes f f<sup>1</sup> and diagonal hole f<sup>2</sup>, when arranged in combination with trough-shaped tiles E and vertical flues d d', substantially as and for the purpose described.

7. The combination of pipes G G', branch pipes g g<sup>1</sup> g<sup>2</sup> g<sup>3</sup> with stop-cocks, when arranged in connection with longitudinal flues f f<sup>1</sup>, vertical flues d d', and horizontal flues C C', substantially as shown, and for the purpose set forth.

In testimony of said invention I have hereunto set my hand.

THEODORE G. MEIER.

Witnesses:

WILLIAM W. HERTHEL,  
ROBERT BURNS.

(164.)