

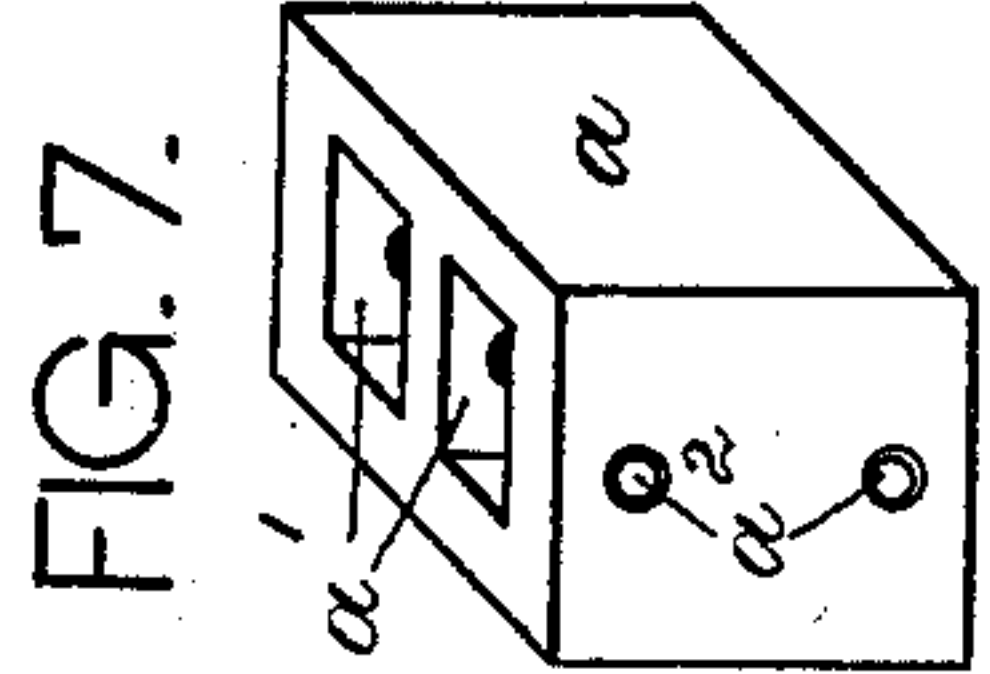
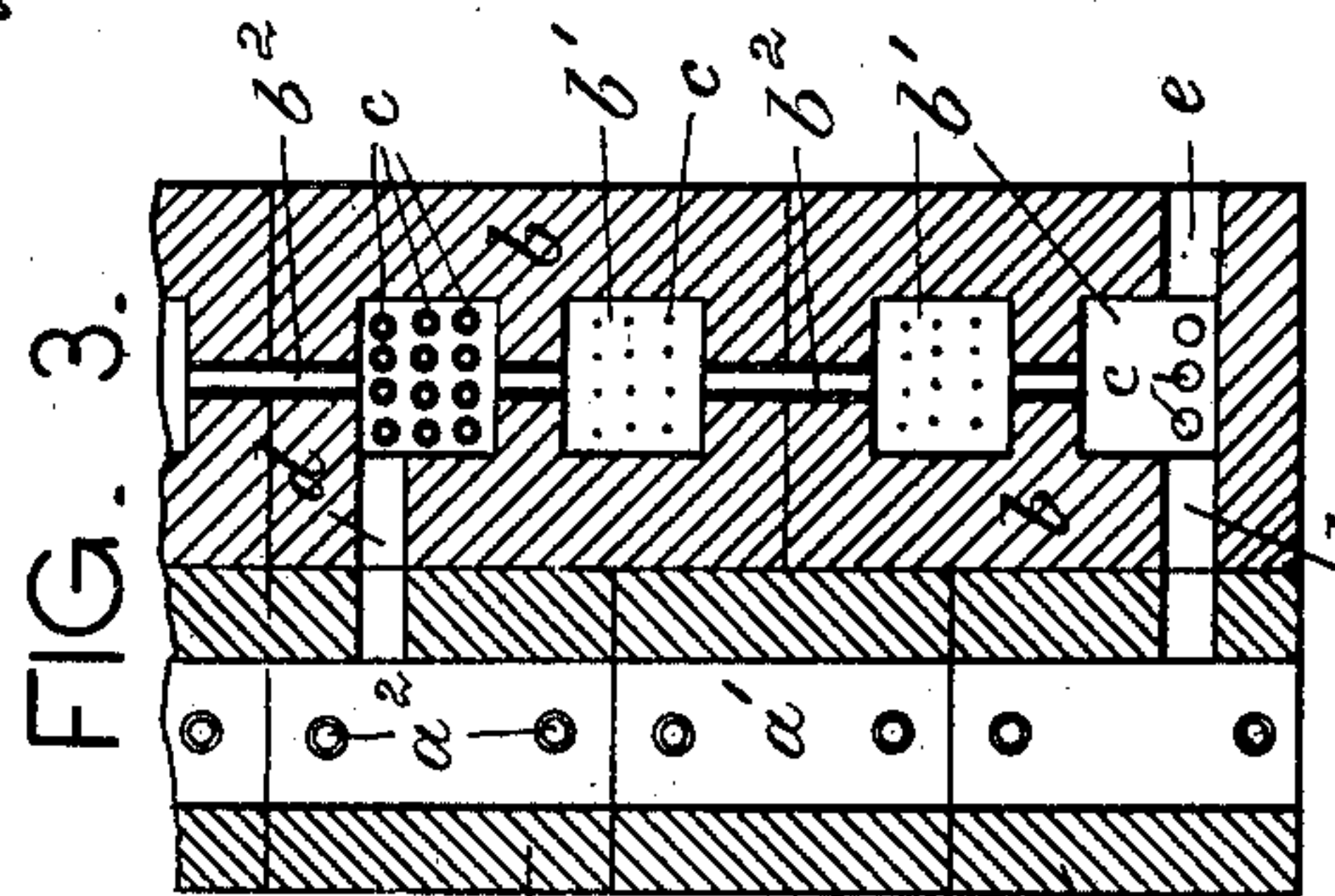
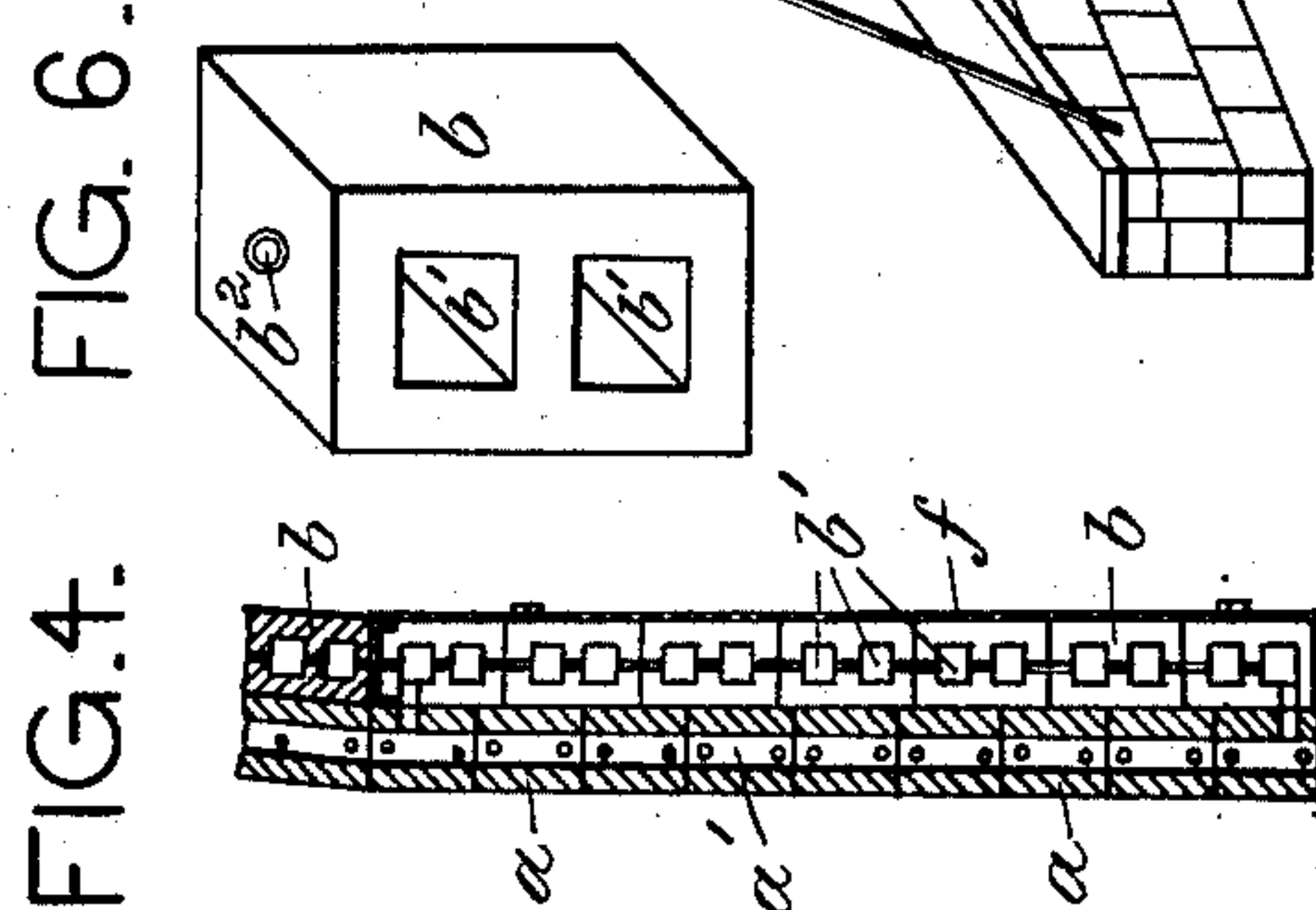
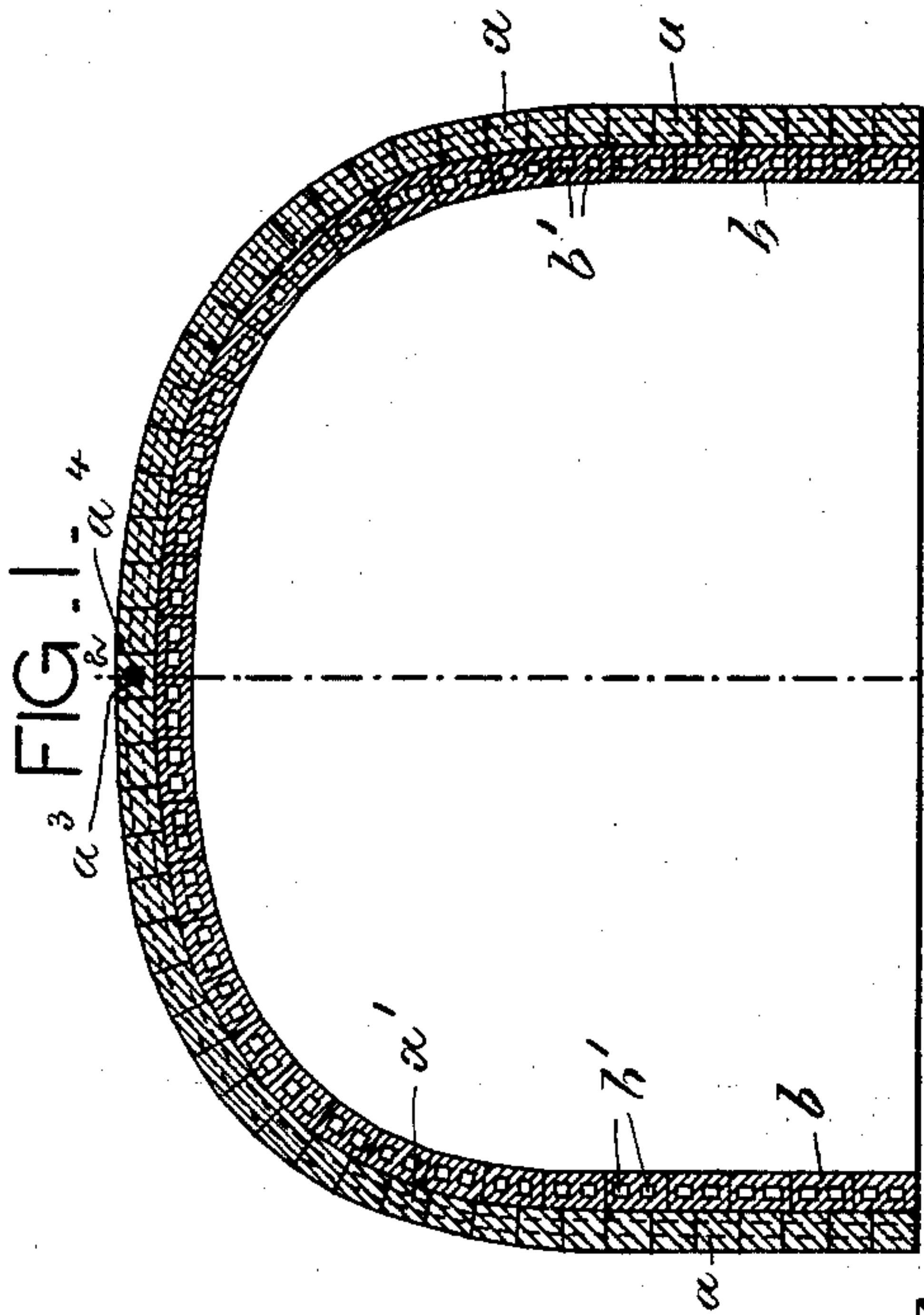
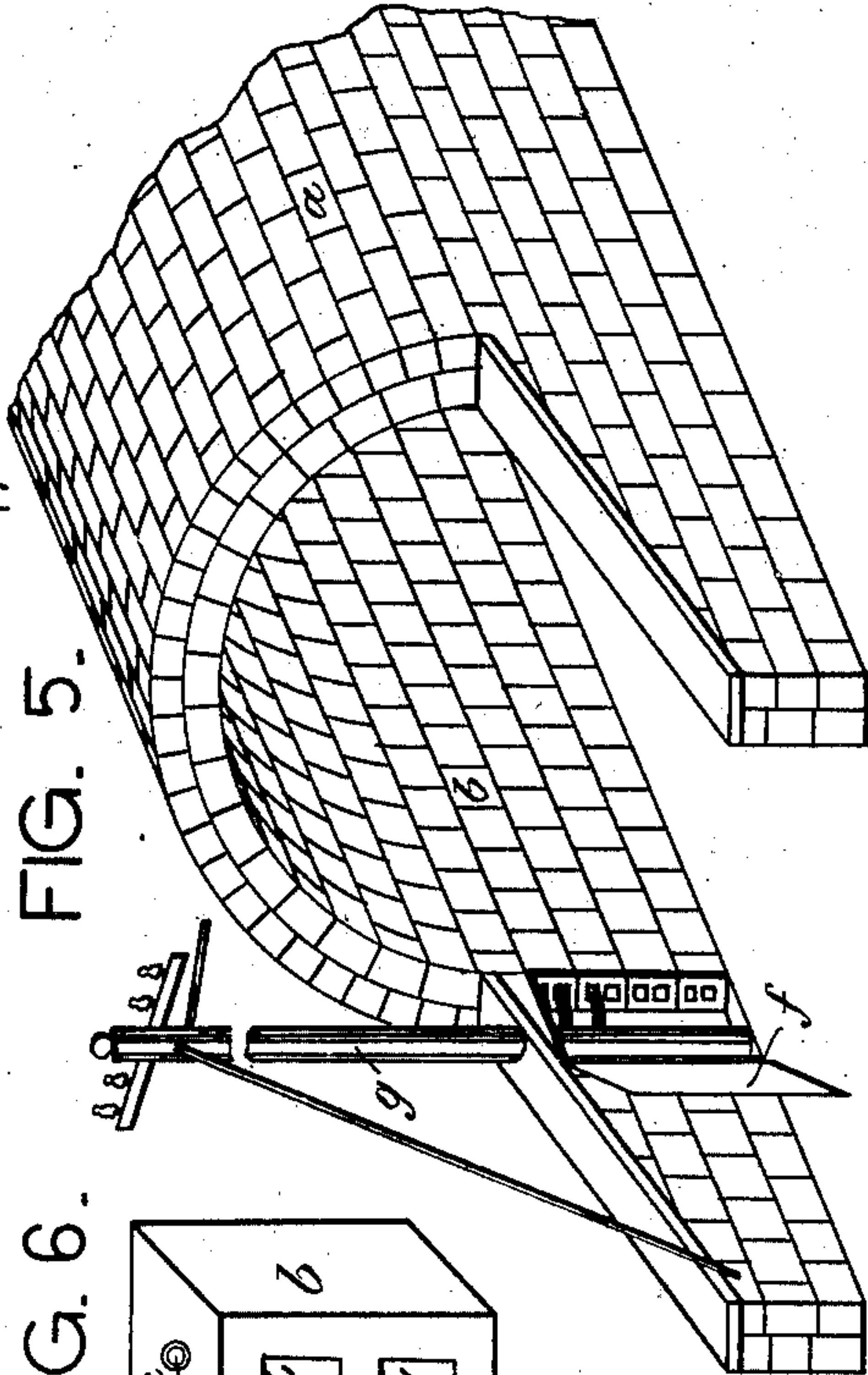
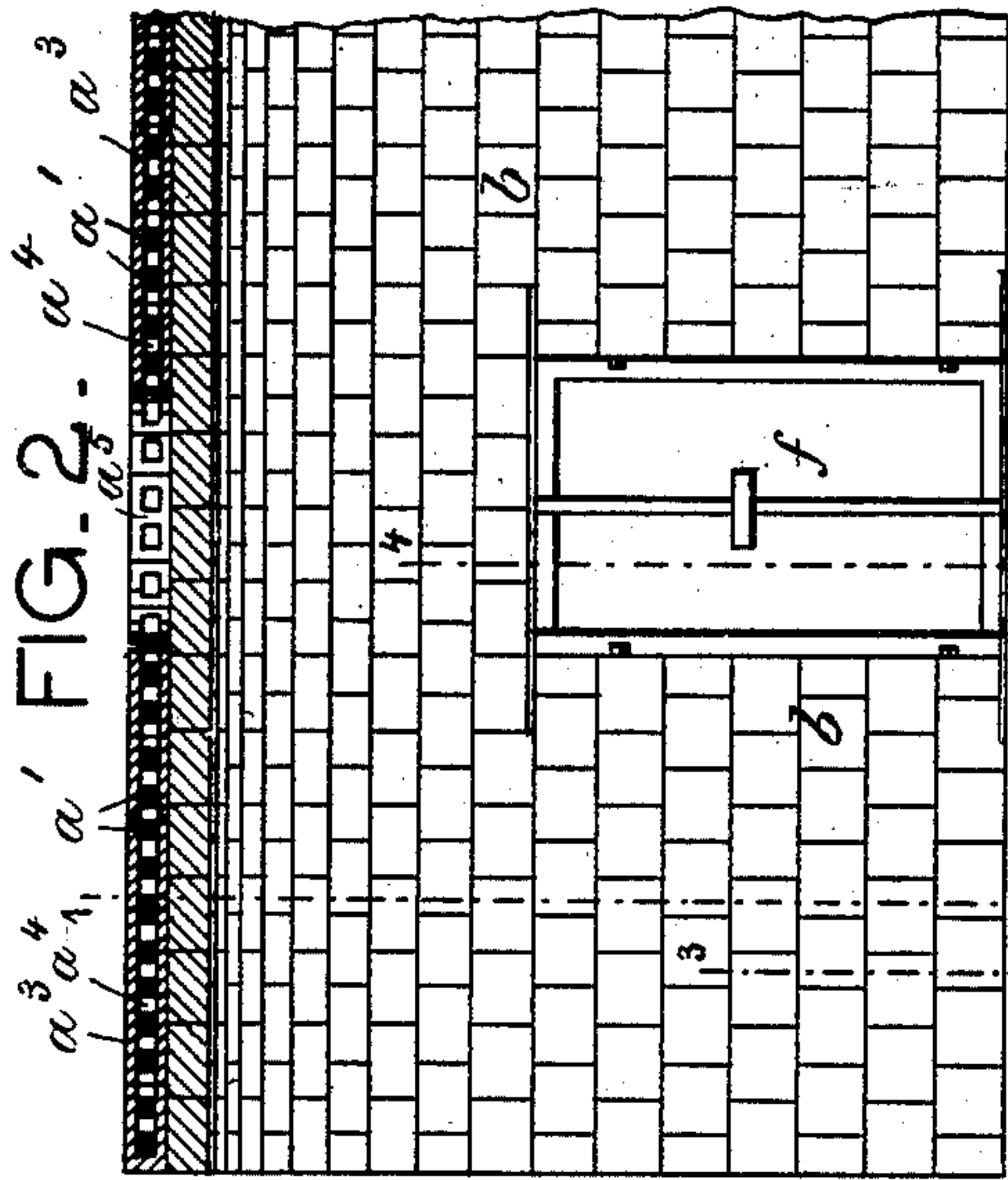
No. 711,257.

Patented Oct. 14, 1902.

N. F. PALMER.  
SUBWAY.

(Application filed Aug. 14, 1902.)

(No Model.)



Witnesses:  
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# UNITED STATES PATENT OFFICE.

NOYES F. PALMER, OF BROOKLYN, NEW YORK.

## SUBWAY.

SPECIFICATION forming part of Letters Patent No. 711,257, dated October 14, 1902.

Application filed August 14, 1902. Serial No. 119,592. (No model.)

*To all whom it may concern:*

Be it known that I, NOYES F. PALMER, a citizen of the United States, and a resident of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Subways, of which the following is a specification.

This invention relates to a subway which is thoroughly ventilated and is provided with abundant means for accommodating the necessary tubing and wiring.

In the accompanying drawings, Figure 1 is a vertical cross-section of my improved subway on line 1 1, Fig. 2; Fig. 2, a longitudinal section on line 2 2, Fig. 1; Fig. 3, an enlarged cross-section on line 3 3, Fig. 2; Fig. 4, an enlarged cross-section on line 4 4, Fig. 2; Fig. 5, a perspective view of one end of the subway; Figs. 6, 7 are perspective views of the blocks for constructing the same.

The subway is constructed of hollow concrete blocks laid in two parallel walls. The outer wall or row of blocks is provided with vertical perforations to constitute ventilating-channels, while the inner row is provided with horizontal perforations to constitute conduits for receiving tubing and wiring.

*a a* are the outer blocks provided with vertical perforations, the perforations of superposed blocks being in alinement, Fig. 3, to form a series of parallel transverse flues or air-passages *a'*. These flues communicate with one another by horizontal perforations *a''*, formed within the ends and the central partition of blocks *a*, so that a free circulation of the air may take place. The keystones *a'''* of the structure are provided with a continuous longitudinal passage *a''''*, Fig. 1, with which the flues *a'* communicate and which discharges the air at intervals along the roof of the subway by openings *a'''''*, Fig. 2.

The inner wall of the subway is built closely up against the outer wall and is composed of hollow concrete blocks *b*, provided with horizontal perforations. The perforations in each tier of blocks are placed in alinement to form a series of horizontal ducts or conduits *b'*. Some of these conduits are used for the reception of tubing or electric wiring *c*, while others constitute air-passages. The passages *b'* communicate with one another by upright perforations *b''*, and they likewise communicate at intervals with the flues *a'* by horizontal perforations *d*. In this way the entire system of air-cells within both walls of the

subway is connected and a thorough ventilation is effected. The cells are drained through exits *e*, that open from the lowermost conduit *b'* at suitable intervals into the interior of the tunnel.

The lower rows of conduits *b*, are interrupted from time to time by intervening chambers accessible from the interior of the subway by doors *f*, by means of which the wiring *c* may be reached. At the termini of the structure the wiring is received within the interior of hollow poles *g*, fitted into the approaches and leading the wiring to the points desired.

It will be seen that my improved subway is of superior strength, is thoroughly ventilated, and provided with ample means for accommodating the necessary tubing and wiring.

What I claim is—

1. A subway composed of an outer row of hollow blocks, having a series of vertical perforations, and of an inner row of hollow blocks, having a series of horizontal perforations, substantially as specified.

2. A subway composed of an outer row of hollow blocks, having a series of communicating vertical perforations, and an inner row of hollow blocks, having a series of communicating horizontal perforations, the vertical perforations of the outer blocks communicating with the horizontal perforations of the inner blocks, substantially as specified.

3. In a subway, an outer row of hollow blocks, having a series of communicating vertical perforations, a longitudinal discharge-passage within the roof of the subway, and ducts that connect the vertical perforations with said discharge-passage, substantially as specified.

4. In a subway an outer row of hollow blocks, having a series of vertical perforations, and a communicating longitudinal discharge-passage, combined with an inner row of hollow blocks, having a series of horizontal perforations, the vertical perforations of the outer blocks communicating with the horizontal perforations of the inner blocks, substantially as specified.

Signed by me at New York city, New York, this 13th day of August, 1902.

NOYES F. PALMER.

Witnesses:

F. V. BRIESEN,  
EDWARD RAY.