

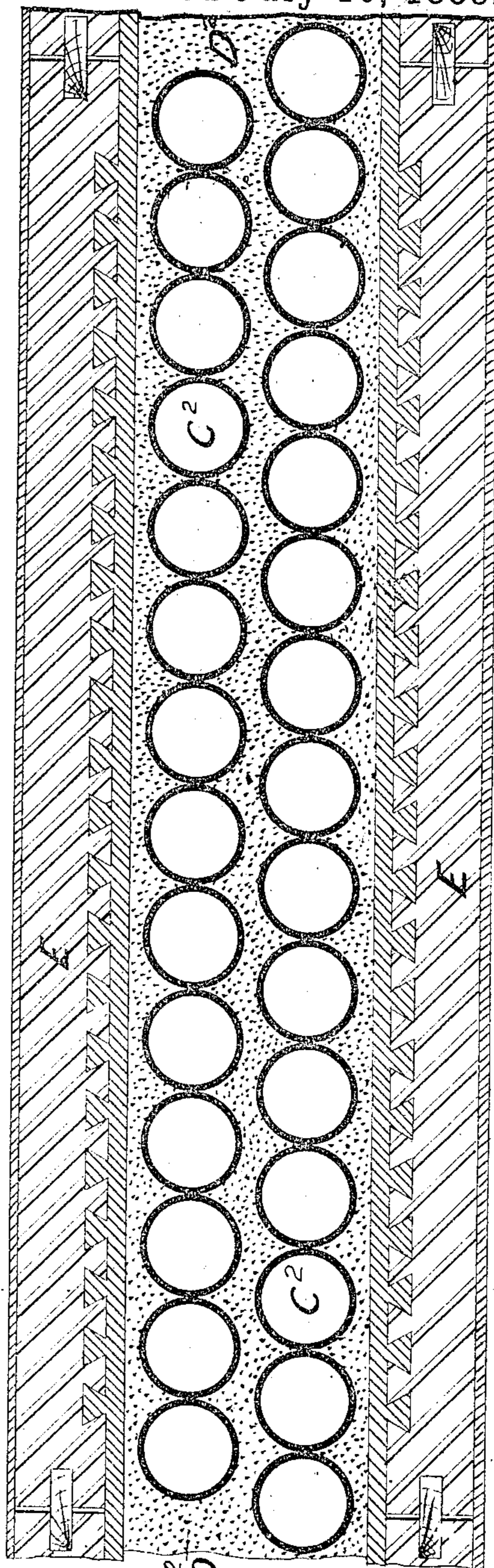
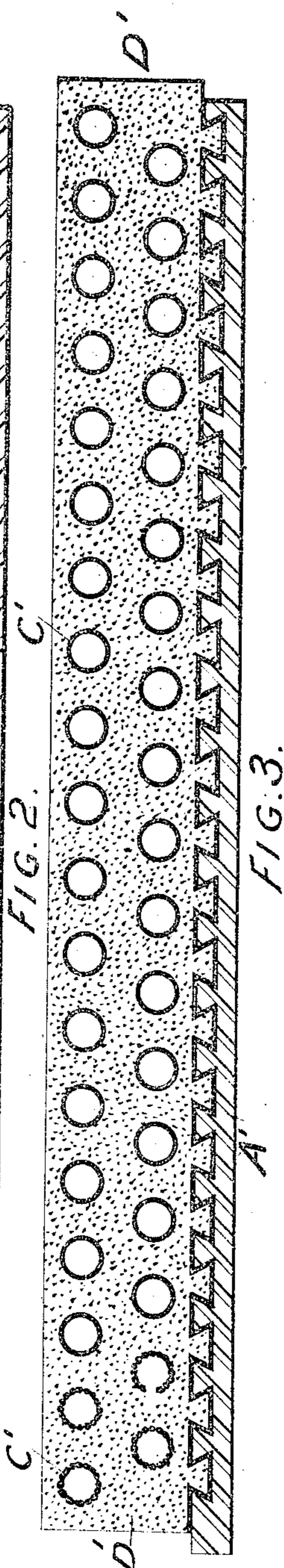
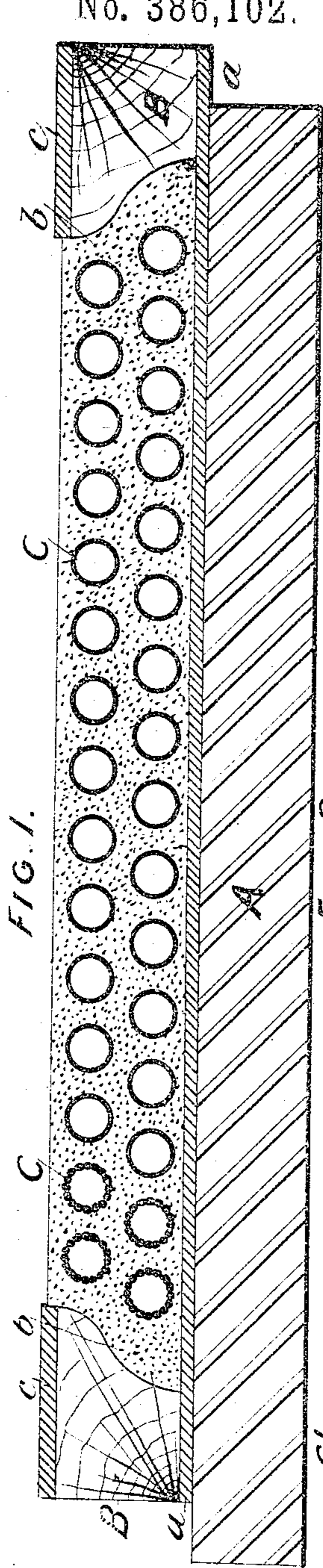
(No Model.)

A. MACK.

BOARD OF COMPOSITE MATERIAL.

No. 386,102.

Patented July 10, 1888.



Witnesses:

*F. D. [Signature]*  
*Th. M. [Signature]*

Inventor:  
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# UNITED STATES PATENT OFFICE.

ADOLF MACK, OF LUDWIGSBURG, WÜRTENBERG, GERMANY.

## BOARD OF COMPOSITE MATERIAL.

SPECIFICATION forming part of Letters Patent No. 386,102, dated July 10, 1888.

Application filed November 29, 1887. Serial No. 256,425. (No model.) Patented in Belgium December 31, 1886, No. 75,709, and October 15, 1887, No. 78,965; in England December 31, 1886, No. 17,130; in Austria-Hungary April 12, 1887, No. 37; in Italy February 4, 1888, No. 22,734, and May 1, 1888, No. 23,156, and in France February 20, 1888, No. 187,347.

*To all whom it may concern:*

Be it known that I, ADOLF MACK, a subject of the King of Würtemberg, residing at Ludwigsburg, Würtemberg, Germany, have invented certain new and useful Improvements in Boards of Composite Material for Ceilings, Walls, and other Building Purposes, (which invention has been patented to me in Belgium by Letters Patent No. 75,709, dated December 31, 1886, and in Austria-Hungary, No. 37, dated April 12, 1887;) and I do hereby declare that the following is a full, clear, and exact specification.

My invention relates to boards, slabs, or plates, chiefly applicable to the usual building purposes of wall and ceiling linings or coverings, and also as a lining for ice-chests, flues, and the like. Each board or plate is chiefly composed of the following materials:

First. A large number of small tubes, either specially made of paper or othersuitable material or formed of vegetable stalks. These tubes are uniformly distributed, so as to form a number of cores for the semi-liquid mass which is subsequently cast in.

Second. A plastic mass consisting of plastic mineral matter—such as burnt gypsum, cement, or lime—and finely-divided solid particles of organic origin—such as small coke, wool, hair, or feathers—with or without the addition of a liquid binding substance, such as glue-water, or a mixture of water with alum, green vitriol, and soluble glass. I do not limit myself to any special proportion between the substances composing the plastic mass; but I prefer to use them in the following relative quantities: gypsum, cement, or lime, fifty parts; small coke, ten parts; wool, hair, or feathers, one part; binding substance consisting of alum, vitriol, and soluble glass, one part.

In the further description reference will be made to the annexed drawings, of which—

Figure 1 is a cross-section of a board provided with a wooden base and frame and applicable to the construction of floors as a base or support for linoleum or asphalt, or in the construction of roofs as a base for copper, zinc, tin, slate, or tile, or as an external lining of ice-stores, or as walls for temporary buildings. Fig. 2 is a cross section of a gypsum board provided with a base of prepared wood, which may, however, be replaced by tarred felt,

asphalt, or asbestos. This kind of board is applicable as a base for polished oak floors laid on asphalt, or for making sound-proof floors, and as a substitute for the usual herring-bone strutting, or as a lining for timber instead of cement or brick-work, or for plaster ceilings by nailing the boards to the ceiling-joists, or as a lining for wooden houses, cellars, and other structures, or for making light vaults and partitions. Fig. 3 is a section of a plain gypsum board as applied to the ceiling and lining of ice-chests and refrigerators. These plain gypsum boards, without base of wood, asphalt, or asbestos, are applicable to the construction of plaster ceilings, plaster partitions, sound-proof and fire-proof floors, as a lining for walls, flues, and for many other purposes. In using them for the linings of ice chests or ice houses the gypsum boards are laid in asphalt.

For making gypsum boards, as shown by Fig. 1, I take a wooden board, A, which is covered with asphalt or asbestos, *a*, or coated with tar, and fix upon it a closed wooden frame, B, with nails or screws or other suitable means. The said frame consists, preferably, of four wood strips covered with india-rubber, *c*, and connected with each other so as to form a rectangular frame, the inside *b* of each strip being molded or beveled inward to form a key for the plastic mass to be cast therein. The interior of the frame B is now uniformly laid with pieces of tubes C approximately parallel to each other, and the interstices are filled up with a plastic mass or material obtained by mixing glue-water or alum, green vitriol, and water-glass with burnt gypsum or cement or lime, and with small coke, wool, hair, or feathers. After the mixture has been cast in the mold or frame B and brought to a uniform surface at the top, it may be dusted with the scales arising from iron forgings or with ground cork, in order to obtain a roughened surface. As soon as the mass has hardened it is dried by exposure to the air.

The gypsum board represented by Fig. 2 consists of a base-plate, A', provided on its upper side with dovetail grooves and rendered fire-proof either by coating or impregnating it with a suitable fire-resisting material—for instance, by a coating of asbestos—and of the gypsum board proper, D', which is produced in the same manner as that in Fig. 1. Instead

of the permanent frame B shown in Fig. 1, I use, however, a mold which is detachable after the mass has become sufficiently hardened.

5 As shown by Figs. 1 and 2, the gypsum overlaps the wooden base (A and A', respectively) on one side, while on the opposite side the wooden base overlaps the gypsum. This is to break joint and make a good overlap connection between adjoining boards.

10 The plain gypsum board shown in Fig. 3 is made as follows: I place tubes or vegetable stalks in a rectangular mold composed of four wooden frames and fill the interstices with a plastic mixture of gypsum, combined with  
15 small coke, wool, hair, or feathers. The surface may be roughened by dusting it with forge scales or ground cork. After the mass has hardened it is taken out of the mold and  
20 dried in the open air. The drawings show a gypsum board, D<sup>2</sup>, placed between two layers of wood, E.

What I claim, and desire to secure by Letters Patent of the United States, is—

25 1. A board for building and industrial purposes, consisting of plastic material and a number of small tubes (either specially made of paper or other suitable material or formed of vegetable stalks) embedded in the said material, substantially as described.

30 2. A board consisting of plastic material, of a number of small tubes (either specially made of paper or other suitable material or formed of vegetable stalks) embedded in the same material, and a wooden base, substantially as described.

35 3. A board consisting of plastic material and of a number of small tubes (either specially made of paper or other suitable material or  
40 formed of vegetable stalks) embedded in the

said material, a wooden base, and a rectangular wooden frame, substantially as described.

4. A board consisting of a mixture of plastic mineral matter with wool, hair, or feathers, and tubes or vegetable stalks embedded in the  
15 said mixture, substantially as described.

5. A board consisting of a plastic mixture of burnt gypsum with hair, wool, or feathers, and tubes or vegetable stalks embedded in the  
20 said mixture, substantially as described.

6. A board consisting of a mixture of plastic mineral matter with finely-divided solid particles of organic origin, and tubes or vegetable stalks uniformly embedded in the said  
25 mixture, substantially as described.

7. A board consisting of a mixture of plastic mineral matter with a liquid binding substance and finely-divided solid particles of organic origin, and tubes or vegetable stalks  
30 uniformly embedded in the said mixture, substantially as described.

8. A board consisting of a plastic mixture of burnt gypsum with a liquid binding substance, finely-divided solid particles of organic  
35 origin, and tubes or vegetable stalks embedded in the said mixture, substantially as described.

9. A board consisting of a plastic mixture principally composed of mineral matter, tubular cores uniformly distributed and embedded  
40 in the said mixture, and a wooden base rendered fire-proof by impregnation or coating, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ADOLF MACK.

Witnesses:

B. ROI,

ARTHUR MARKS.