

(No Model.)

2 Sheets—Sheet 1.

B. W. BELDEN.

FRAME FOR BUILDING BLOCKS OR PAVING TILES.

No. 400,996.

Patented Apr. 9, 1889.

Fig. 1.

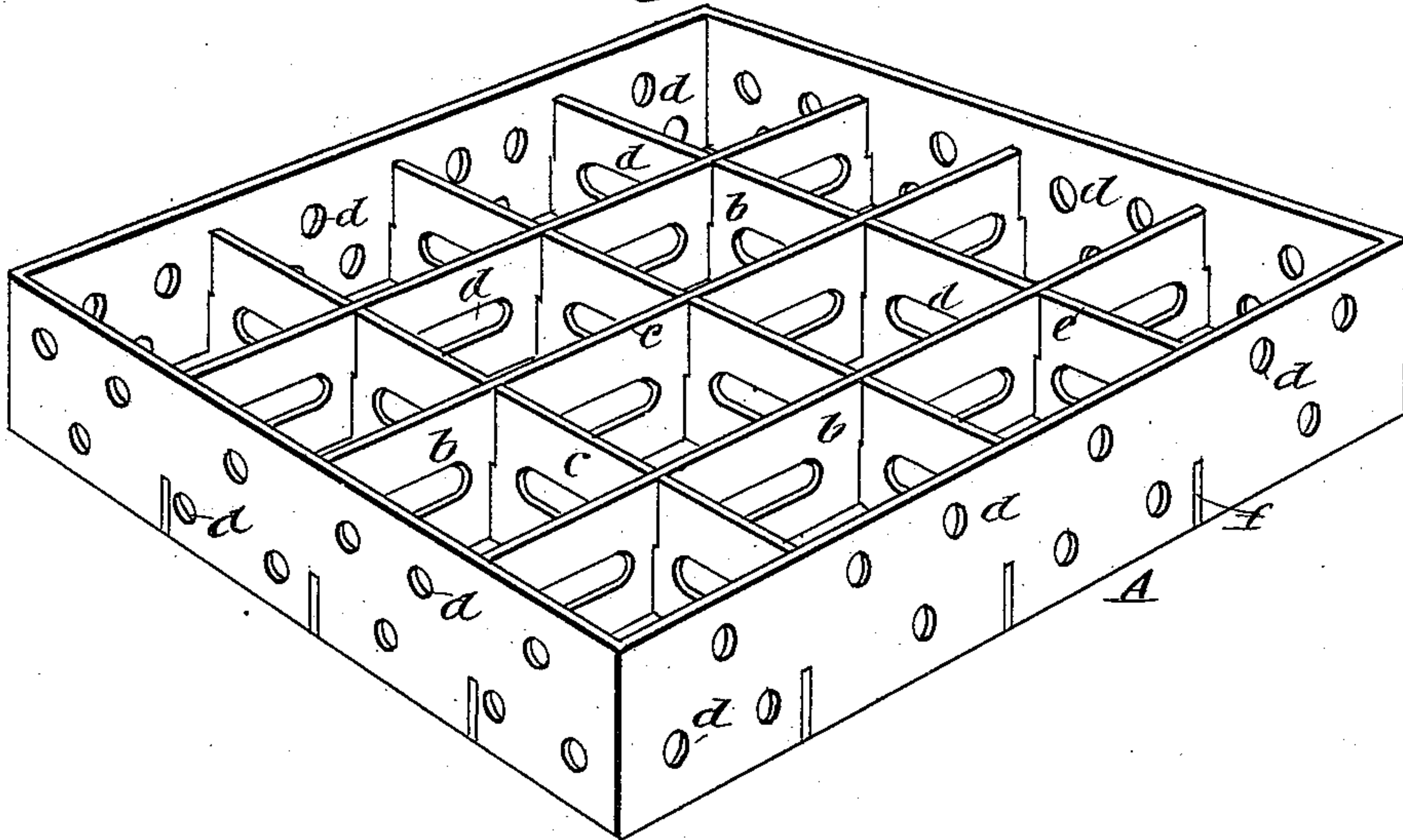


Fig. 2.

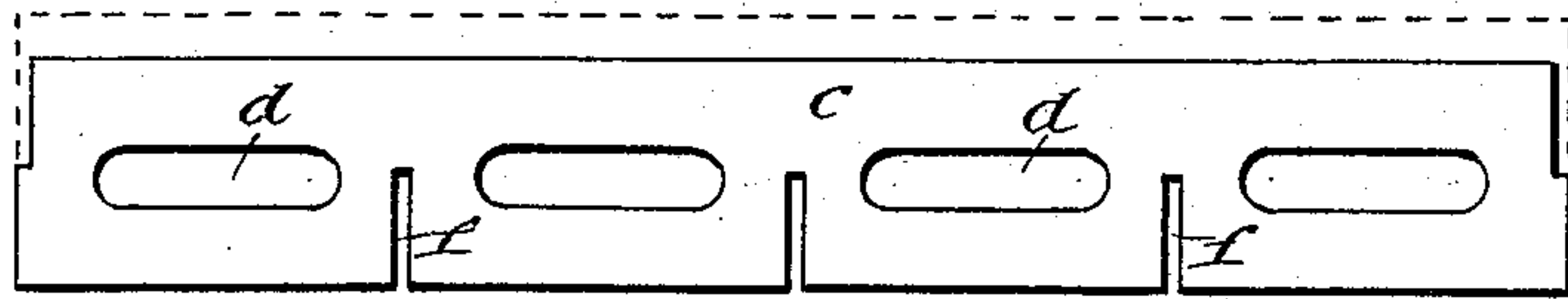
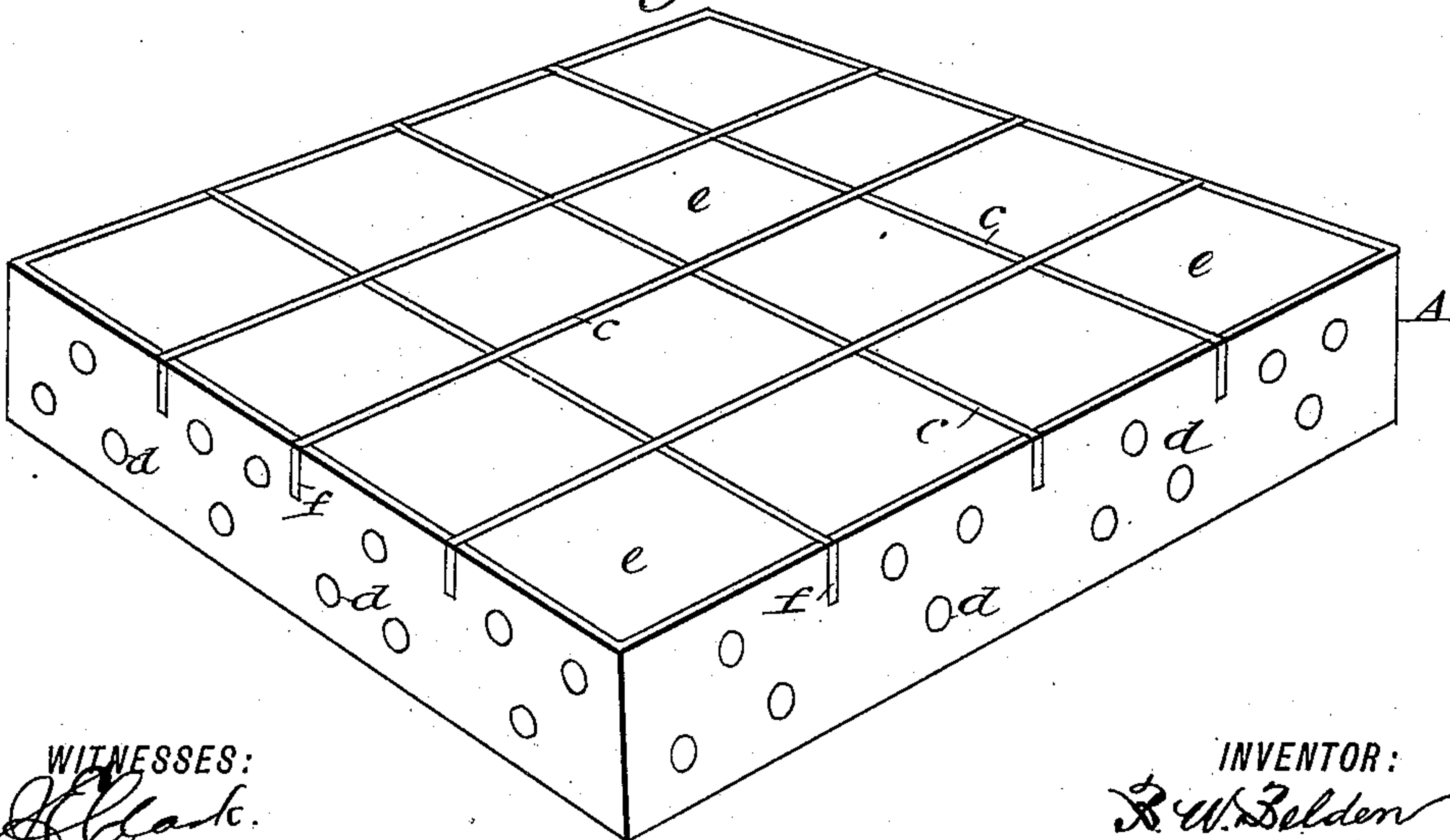


Fig. 3.



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Fig. 4.

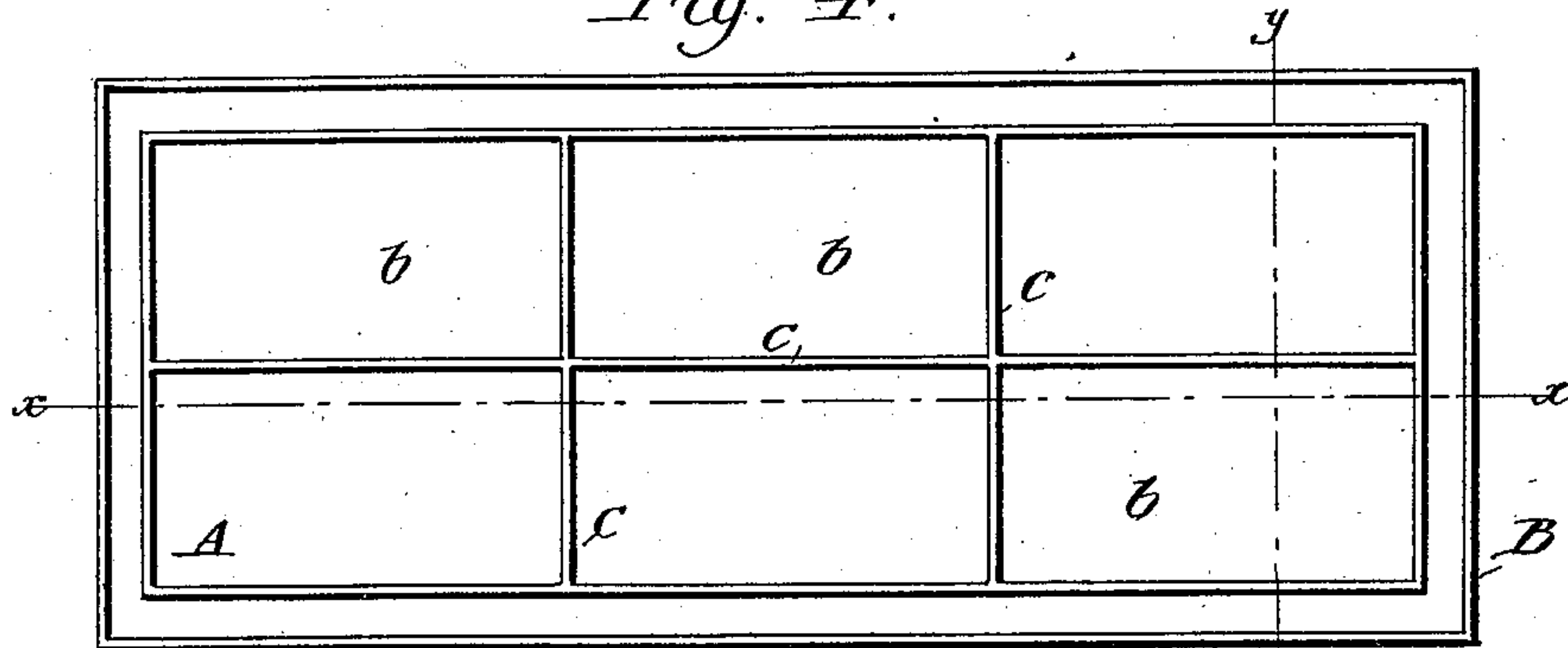


Fig. 5.

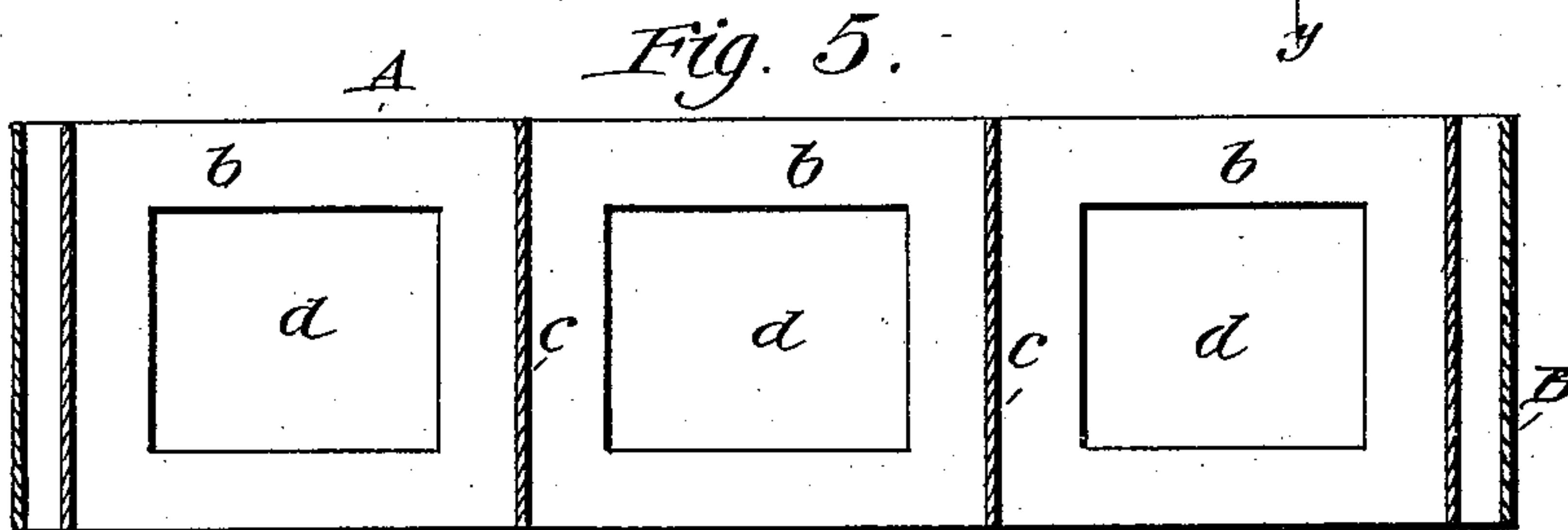


Fig. 6.

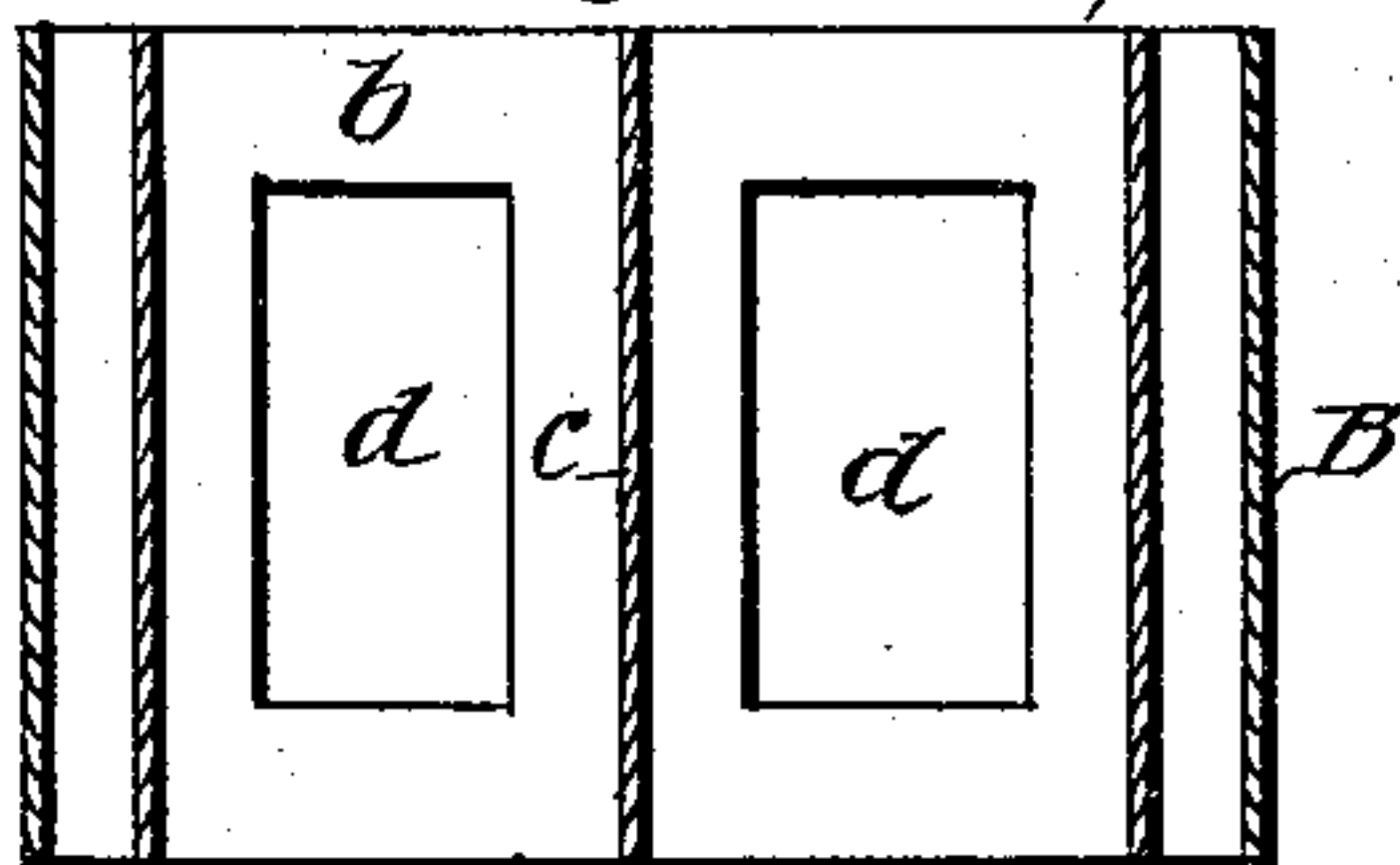
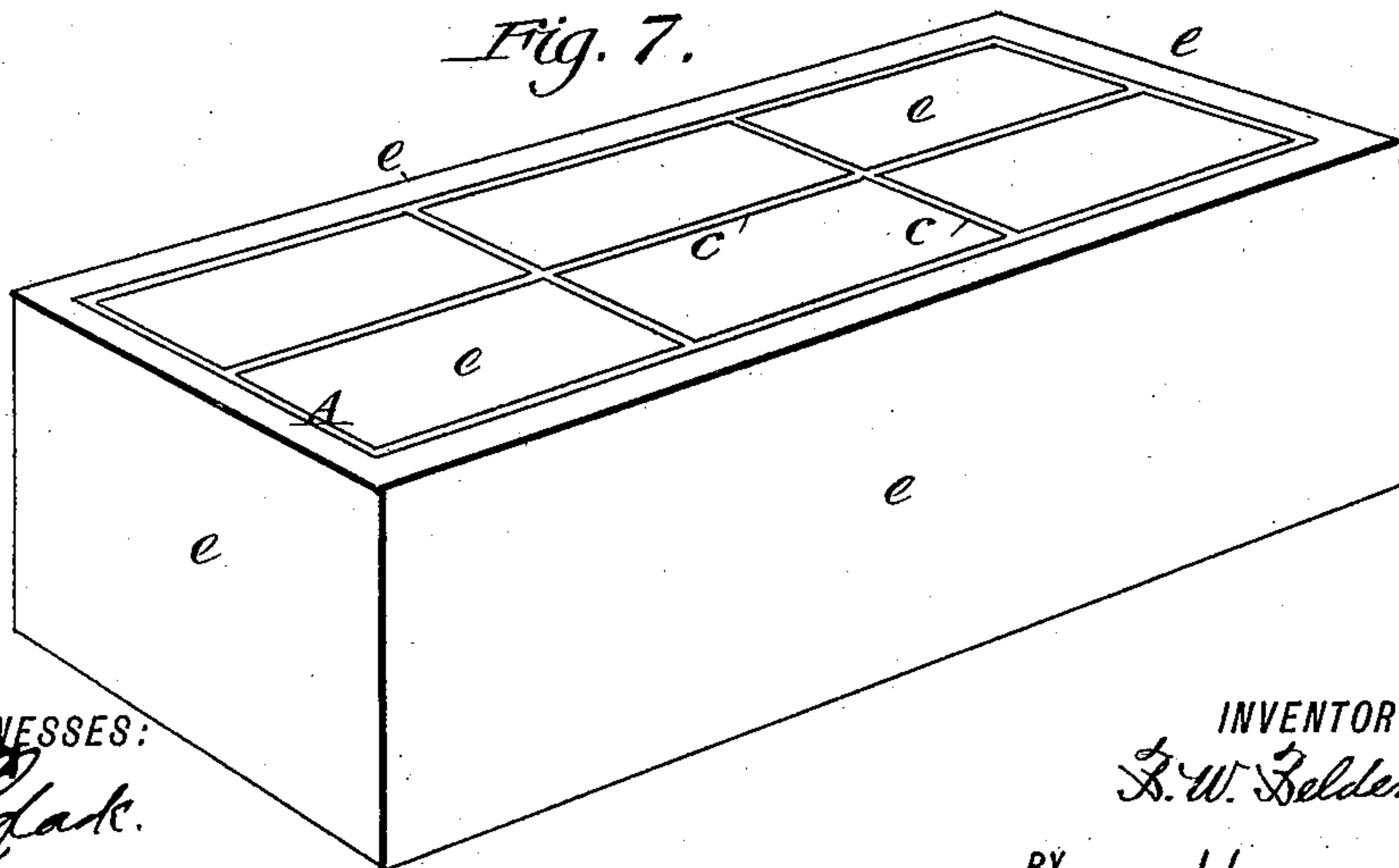


Fig. 7.



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UNITED STATES PATENT OFFICE.

BENJAMIN WALKER BELDEN, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO GUSTAVE J. MEYER, OF SAME PLACE.

FRAME FOR BUILDING-BLOCKS OR PAVING-TILES.

SPECIFICATION forming part of Letters Patent No. 400,996, dated April 9, 1889.

Application filed November 28, 1888. Serial No. 292,055. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN WALKER BELDEN, of St. Louis, in the State of Missouri, have invented a new and useful Improvement in Building Frames and Materials, of which the following is a full, clear, and exact description.

My invention relates to an improvement in building frames and materials; and its object is to provide a new and efficient substitute for brick, natural and artificial stone, cements, concrete, wood, metals, and other compositions now ordinarily employed in the construction of houses and other buildings, bridges, and similar structures, also adapted to be used in the fabrication of pavements for streets, sidewalks, floors, yards, and cellars, as well as in all works of masonry and architecture in which stone, brick, cement, or compositions enter as building materials. This substitute is designed to combine and secure superior strength, durability, solidity, facility of making and operating, beauty of finish, and economy in cost; and the invention consists in a block or structure of novel construction, which will hereinafter be fully described in the annexed specification, and particularly pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a view in perspective of a perforated partitioned frame, such as may be used in making pavements in accordance with my invention; Fig. 2, a face view of one of the partitions of said frame detached, and Fig. 3 a perspective view of said frame from a reverse side to that shown in Fig. 1 and as having incorporated with it the desired filling. Fig. 4 is a plan view of a perforated partitioned frame arranged within an outer mold or case and as suitable for making substitutes for building-stones and other articles. Fig. 5 is a longitudinal section of the same upon the line *x x* in Fig. 4; Fig. 6, a transverse section thereof upon the line *y y* in Fig. 4, and Fig. 7 a view in perspective of the block produced when removed from the outside mold.

Referring in the first instance to Figs. 1, 2, and 3, A indicates a portable frame, case, or mold having any number of sections, cells,

or compartments, *b*, formed by partitions *c*, and the several sides or walls of each compartment being provided with apertures *d*, so arranged that they will establish a free communication between the various divisions of the frame. After said frame has been thus constructed it is then filled with hydraulic cement, paper-pulp, clay, or other suitable plastic composition or material, *e*, which, hardening in the frame, will form a solid concrete mass having the properties or qualities hereinbefore described.

The frame may be made of wood, metal, straw-board, or other suitable substance, but preferably of some non-corrosive metal—such, for instance, as galvanized sheet-iron—and the whole structure, including its outer shell, ribs, or partitions and perforations, may be of any desired size, shape, or proportions.

In the construction of the frame when made of sheet metal or other suitable material, the same is either cut, sawed, or cast by any of the well-known processes into strips or ribs forming the partitions *c*, as shown in Fig. 2, which strips and the outer walls of the frame may have slits *f* in them to secure their engagement with one another; or the entire frame may be cast in one piece. After the partitions and outer shell of the frame have been fitted together, as in Fig. 1, the whole frame is placed flat upon a level surface and the filling *e* then poured or pressed into the compartments *b* until full or on a level with the upper edge of the frame. The cement or other filling, being of a proper consistency, readily flows from one compartment into all the others, the perforations *d* aiding this. This thoroughly embeds the frame-work in the filling, and firmly binds or unites the various compartments together, the mass passing through the perforations *d* interlocking the filled compartments with each other and the frame together and forming when hard a solid body, as shown in Fig. 3.

Tubes, pipes, sewers, chimneys, and arches may be similarly constructed, the metal or other material forming the frame being cut into square, circular, segmentary, or other suitably-shaped parts having perforations and slots, as described, and the ribs or partitions, according to the character of the work, being either on the inside or outside of the frame, after which the frames thus constructed are

incased in removable molds, and the plastic or like filling introduced and allowed to harden. In this manner the frames may be filled either after being placed in position for permanent service or be filled and finished at the factory, and in preparing them the edges of the frame, either on one or all sides, may be totally or partially covered by the filling, according to taste or the purpose for which they are to be used. This mode of construction will be readily understood by reference to the four last figures of the drawings relating to the manufacture of artificial blocks of stone, hereinafter described.

In case the filling is of clay the product may be baked or burned, like brick, to secure any degree of hardness, and by the admixture of appropriate pigments with the filler any color or shade may be imparted to the mass.

In the manufacture of artificial blocks of stone, Figs. 4, 5, 6, and 7 of the drawings being now referred to, in which it may be desirable to conceal the frame entirely, said frame A consisting of the outer wall or case, with its partitions *c* forming compartments *b*, having communicating perforations *d* in their sides, is incased by or placed within an outer molding-frame, B, which serves to hold the filler in position until hardened, when it is removed, leaving the frame A wholly or mainly invisible, if desired, within the mass, or embedded therein, as shown in Fig. 7.

As any desired shape or dimensions may be given to the blocks or articles made, as herebefore described, the same may be used in making the walls of houses, ceilings, interior work, and decorations in place of laths and plastering; also in making arches, cornices, posts, columns, bridges, dams, and levees, floors for hallways and stairs, statuary, mantels, hearths, and chimneys, slabs, and ornaments for furniture, sewer and water mains, tubes, and pipes for water and gas, aquariums and reservoirs, pavements for all purposes, and various other structures where brick, stone, plaster, cement, or different compound building substances are now used.

The ribs or partitions *c* serve to produce absolute inflexibility, while the filling itself will keep the various parts of the frame immovable, and thus each will add to the natural strength of the other. In this respect the article produced being tough and non-fragile, it will excel brick and stone where such properties are essential.

The strength secured by the construction of such blocks or articles, as described, admits of paving-blocks so constructed being made comparatively thin, which, besides reducing the cost of production, will cause them to expand and contract under the influence of heat and cold without breaking or cracking, thereby giving them a decided advantage over other pavements. The size of the blocks, their moderate weight, and the uniformity and precision possible in laying them will prevent sinking and do away with those

unsightly holes, cracks, and depressions so commonly to be seen in pavements. In case of fractures, produced by unusual violence, the injury would affect only the section receiving the blow, which is not the case with ordinary pavements, and the fractured section could be easily and cheaply repaired by removing the filling and refilling the injured compartment, and all this could be done without disturbing the other portions of the block.

The simplicity of the process necessary will enable any inexperienced person to perform the entire operation of cutting the partitions, mixing the filler, fitting and filling the frame, and placing the finished blocks in position for service. Besides these, there are many other advantages which it is not necessary to mention.

The quality of the filling may vary according to taste and outlay desired, and the same, if necessary, be such that for ornamental purposes it will admit of a high polish.

In shipping the blocks the same may either be done entirely made up or with the frame in detached pieces ready for being put together and the filling afterward applied, and in any case the packages would be compact and the nature of the product would obviate all risk of loss by breakage or injury by handling.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. As an improvement in building-blocks, the frame A, formed of thin strips of non-corrosive material, said frame consisting of an outer shell or casing, and parallel strips arranged at right angles to each other provided with apertures, said strips forming communicating compartments adapted to receive the plastic material, substantially as and for the purpose described.

2. As an improvement in building-blocks, the frame A, formed of suitable thin strips of non-corrosive material, said frame consisting of an outer shell and inner strips arranged parallel to and crossing each other at right angles, the walls of said shells and the strips provided with horizontally-arranged apertures and vertically-arranged slits, whereby said strips and shell may be interlocked, thereby forming compartments communicating with each other, said compartments adapted to receive the plastic material, substantially as and for the purpose described.

3. As a new article of manufacture, a block for building or paving purposes consisting of the frame A, formed of thin apertured strips arranged parallel and at right angles to each other and interlocked, as described, and a plastic composition disposed within said compartments and through the apertures in the walls thereof, all arranged substantially as shown, and for the purpose specified.

Witnesses: BENJAMIN WALKER BELDEN,
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