

No. 672,176.

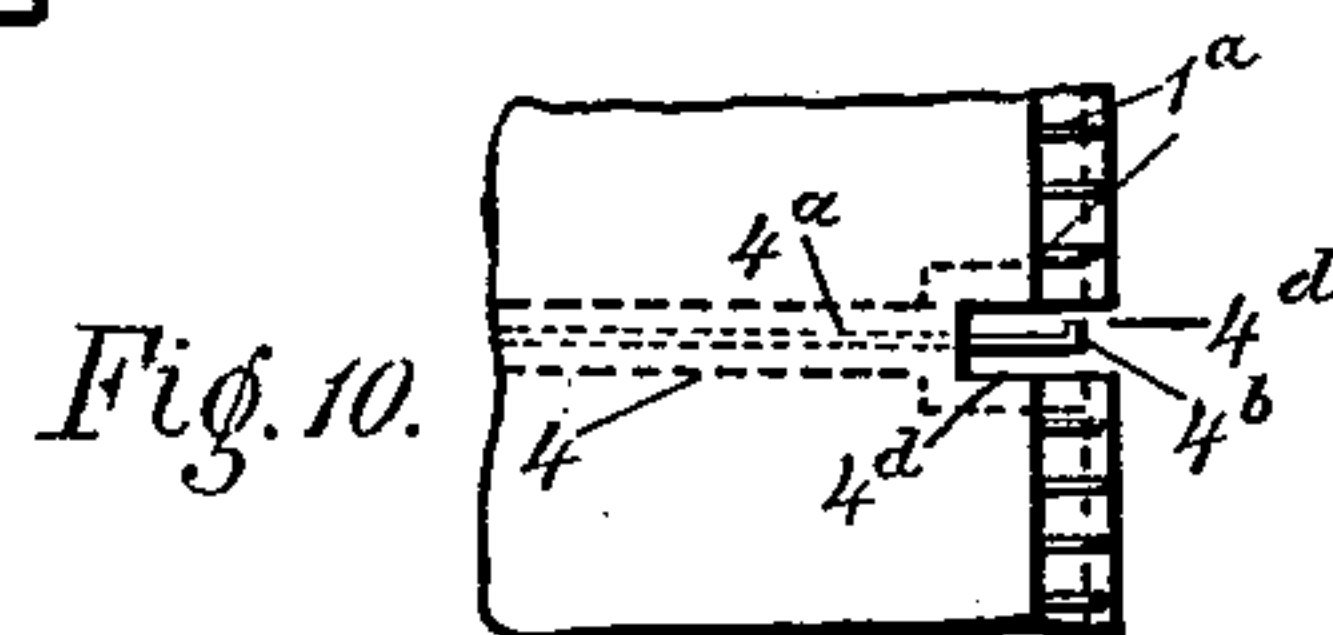
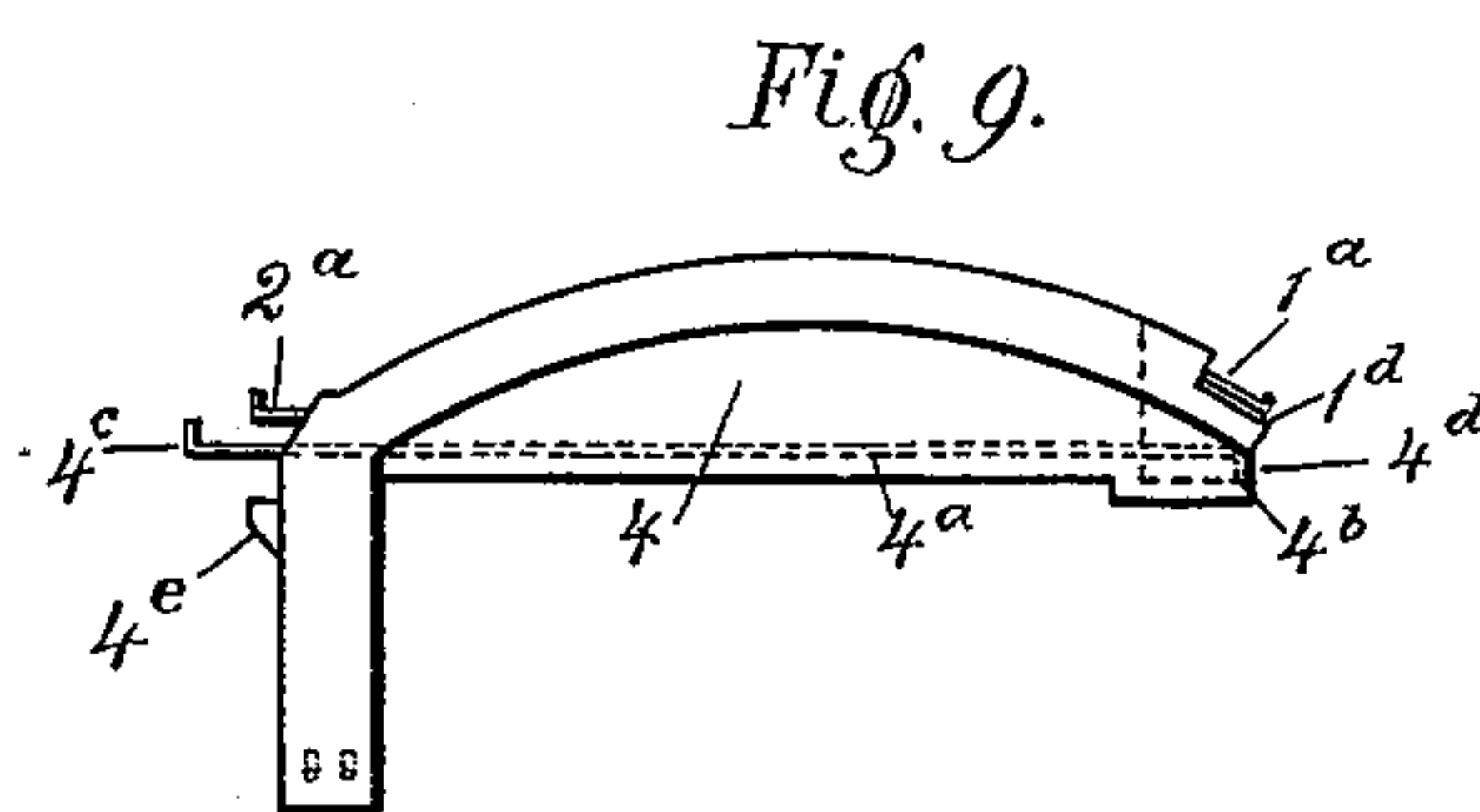
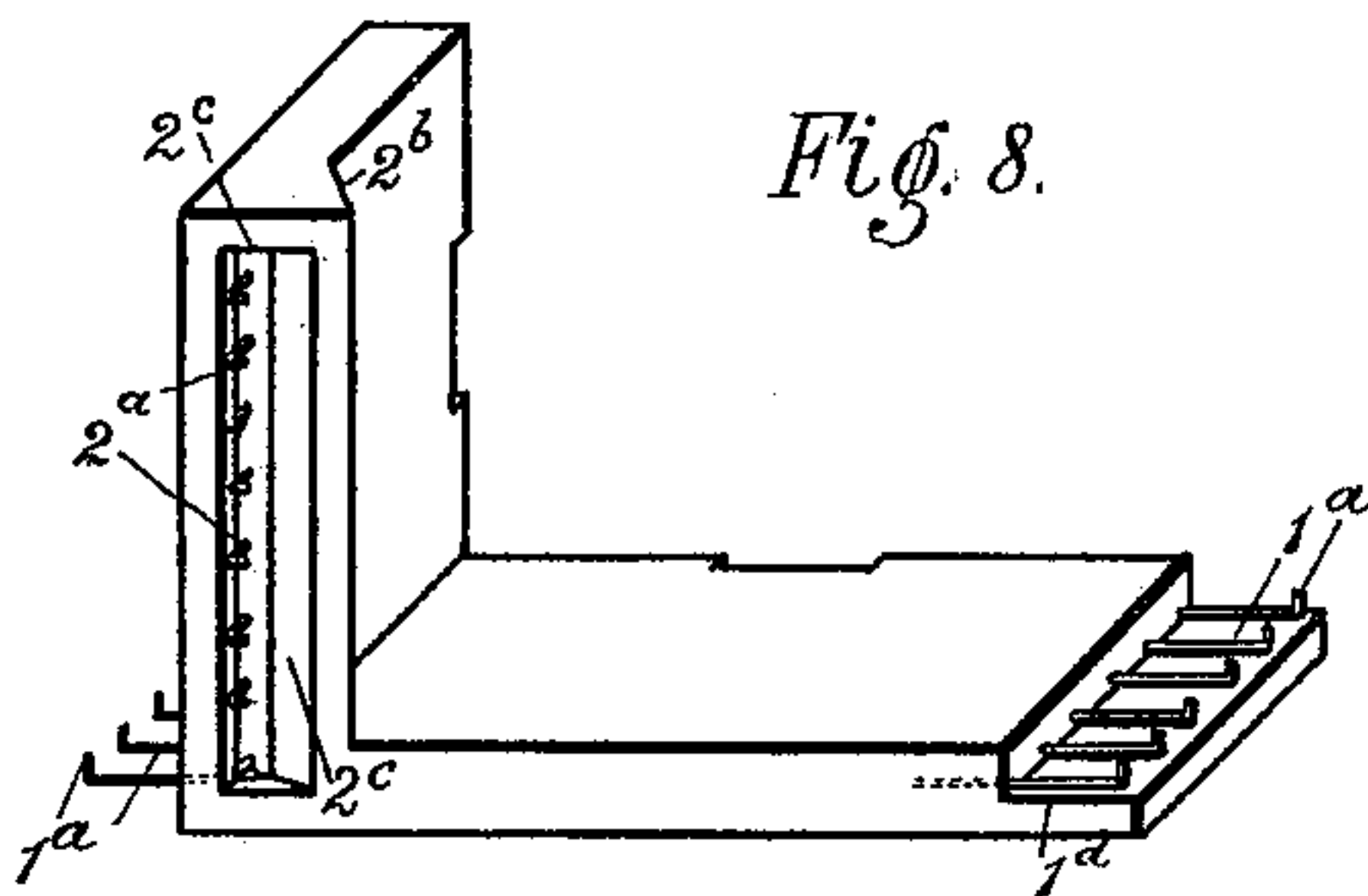
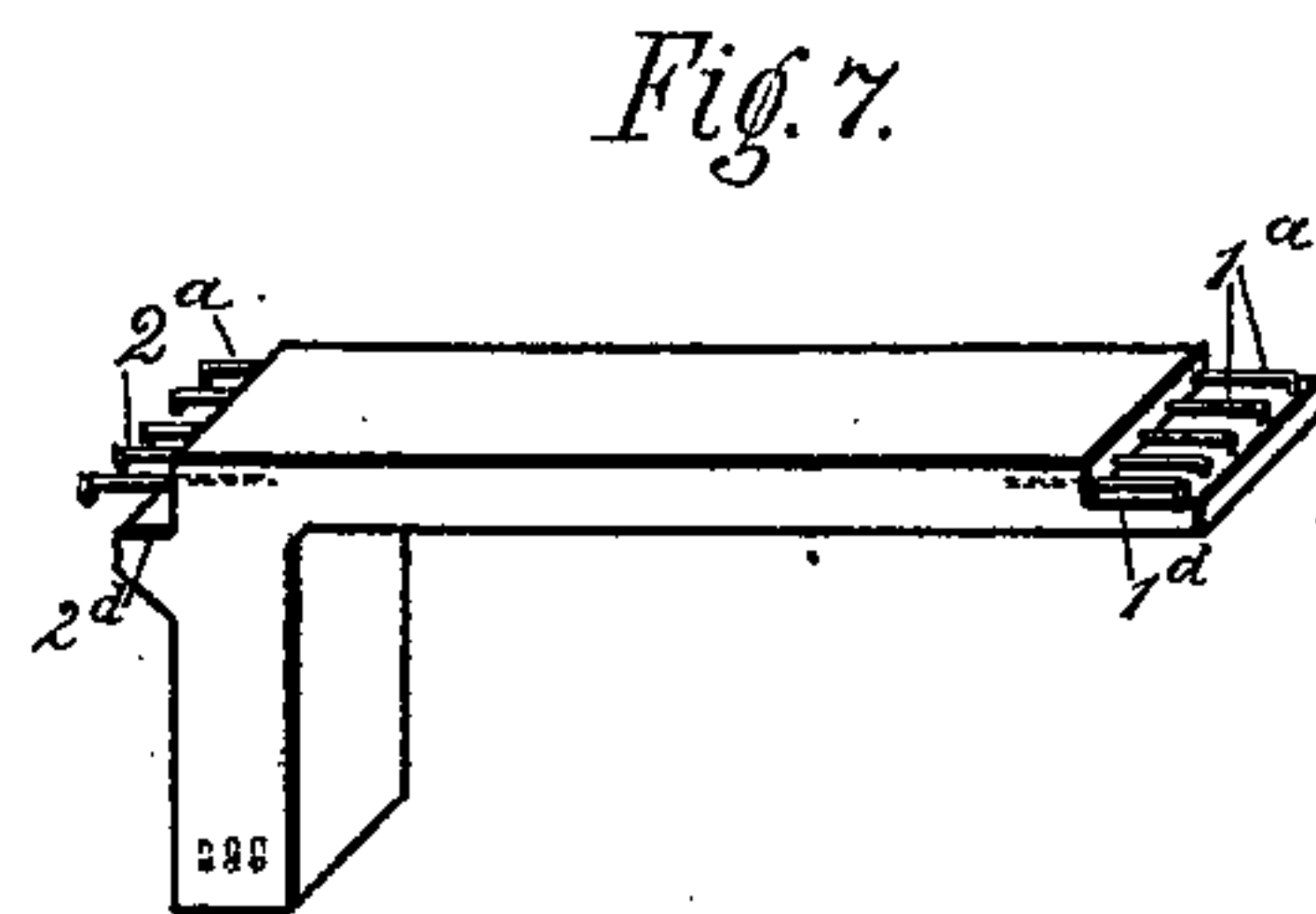
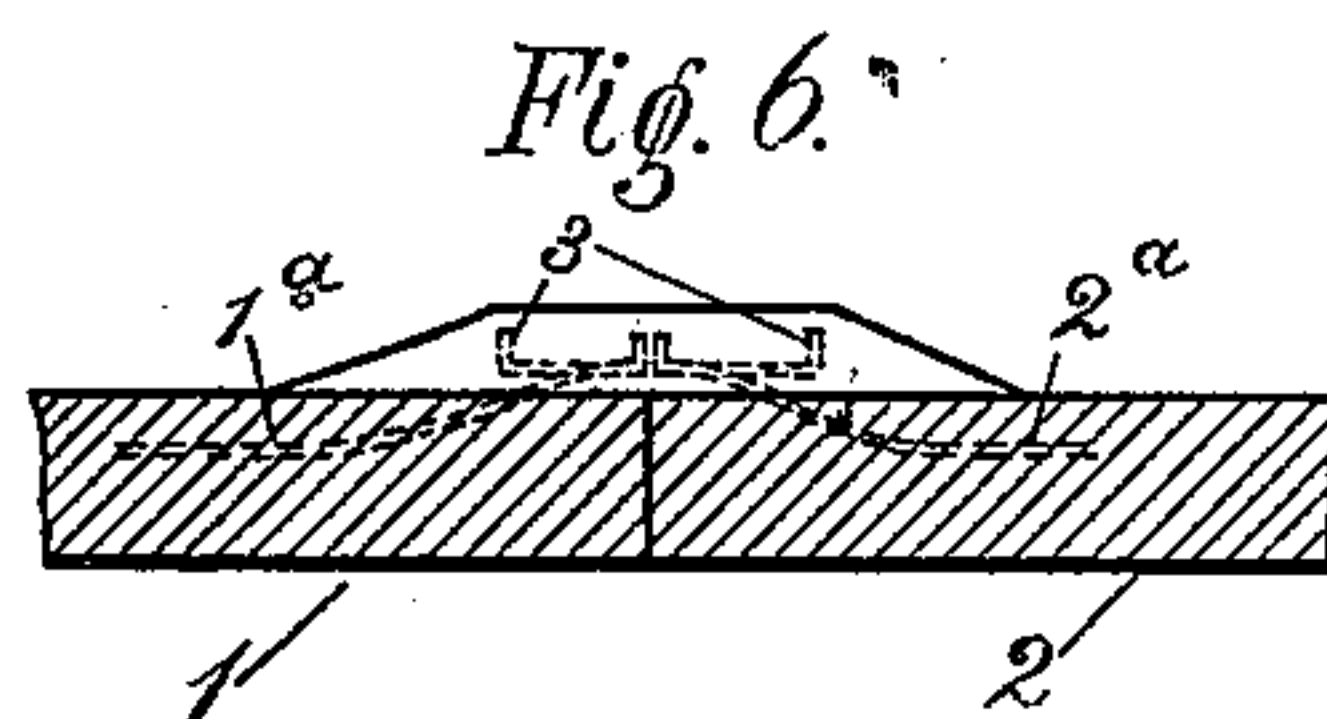
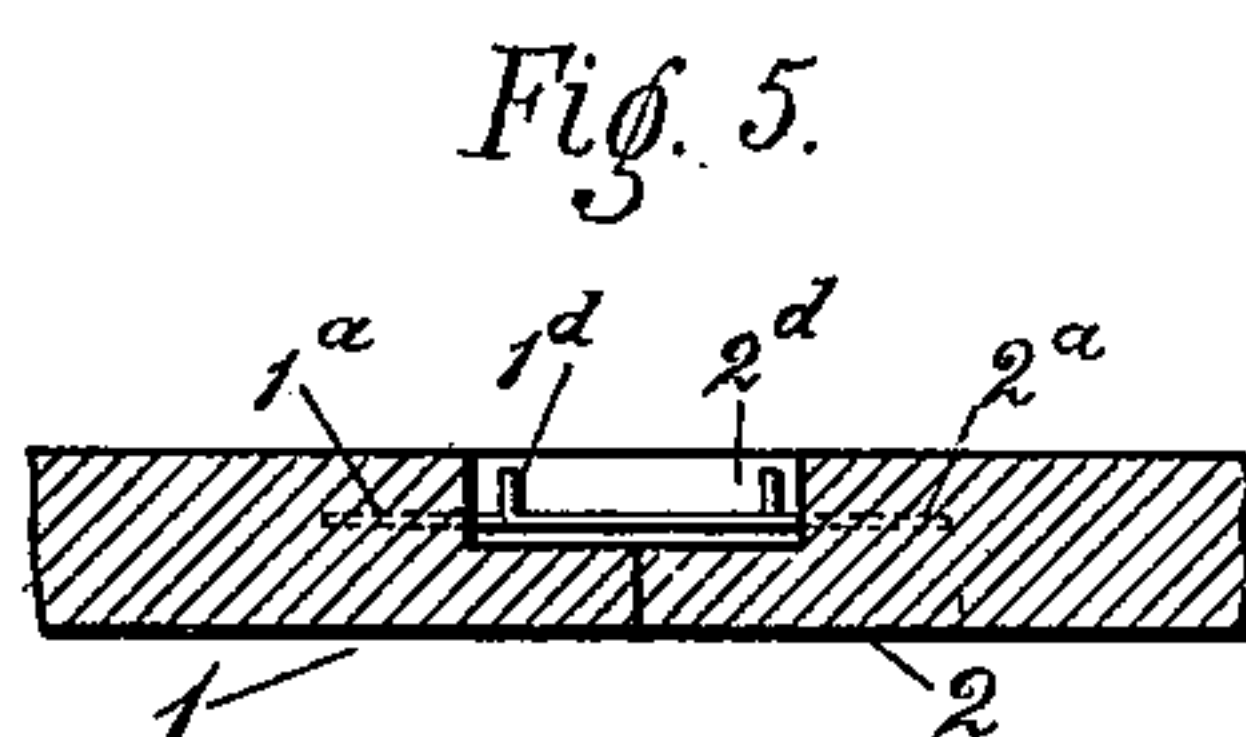
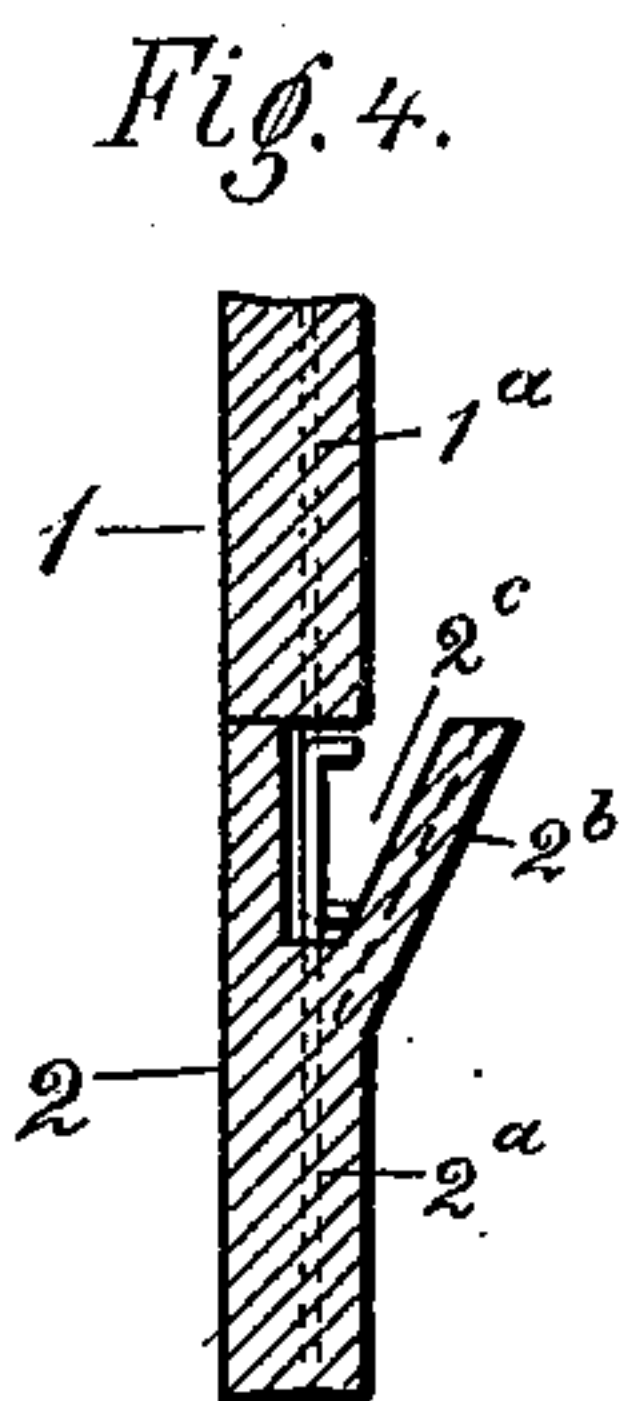
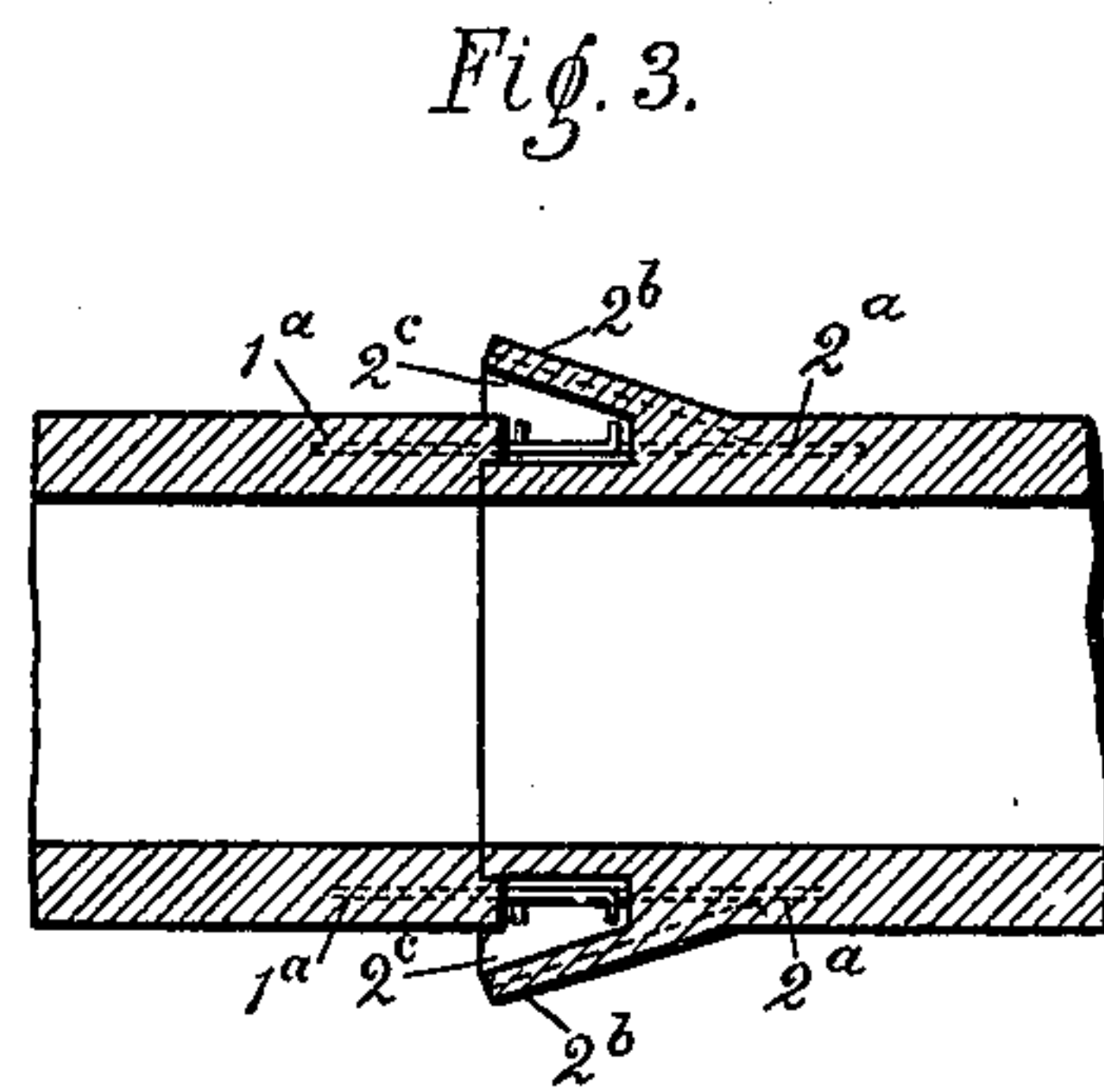
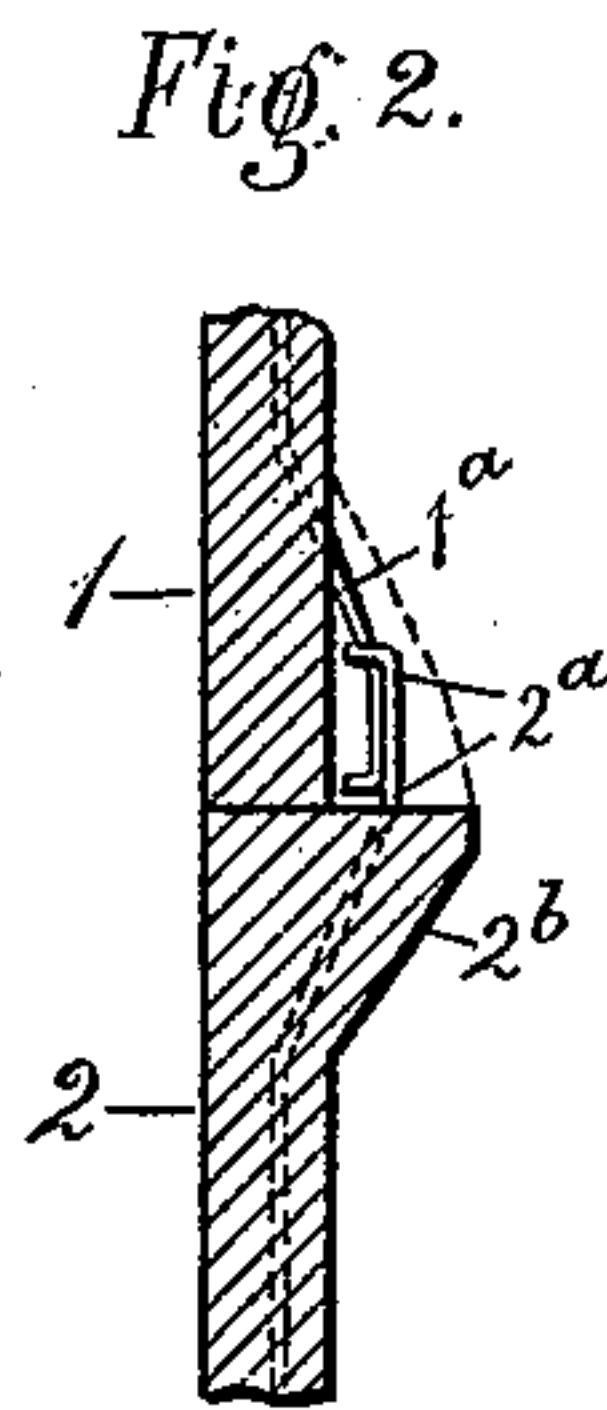
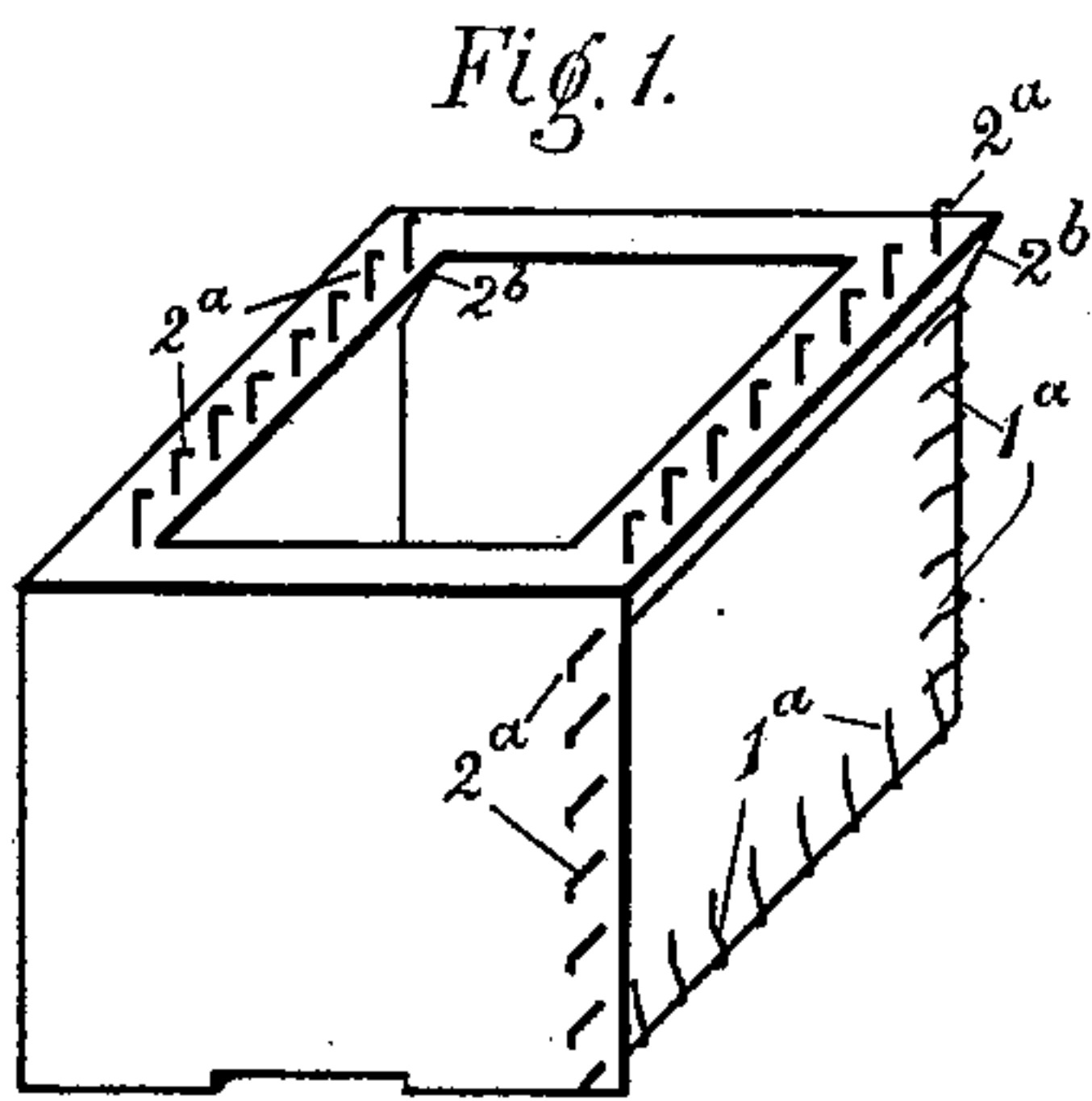
Patented Apr. 16, 1901.

F. MELBER.
CEMENT OR CONCRETE CONSTRUCTION.

(No Model.)

(Application filed May 5, 1900.)

2 Sheets—Sheet 1.



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No. 672,176.

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(Application filed May 5, 1900.)

2 Sheets—Sheet 2.

Fig. 11.

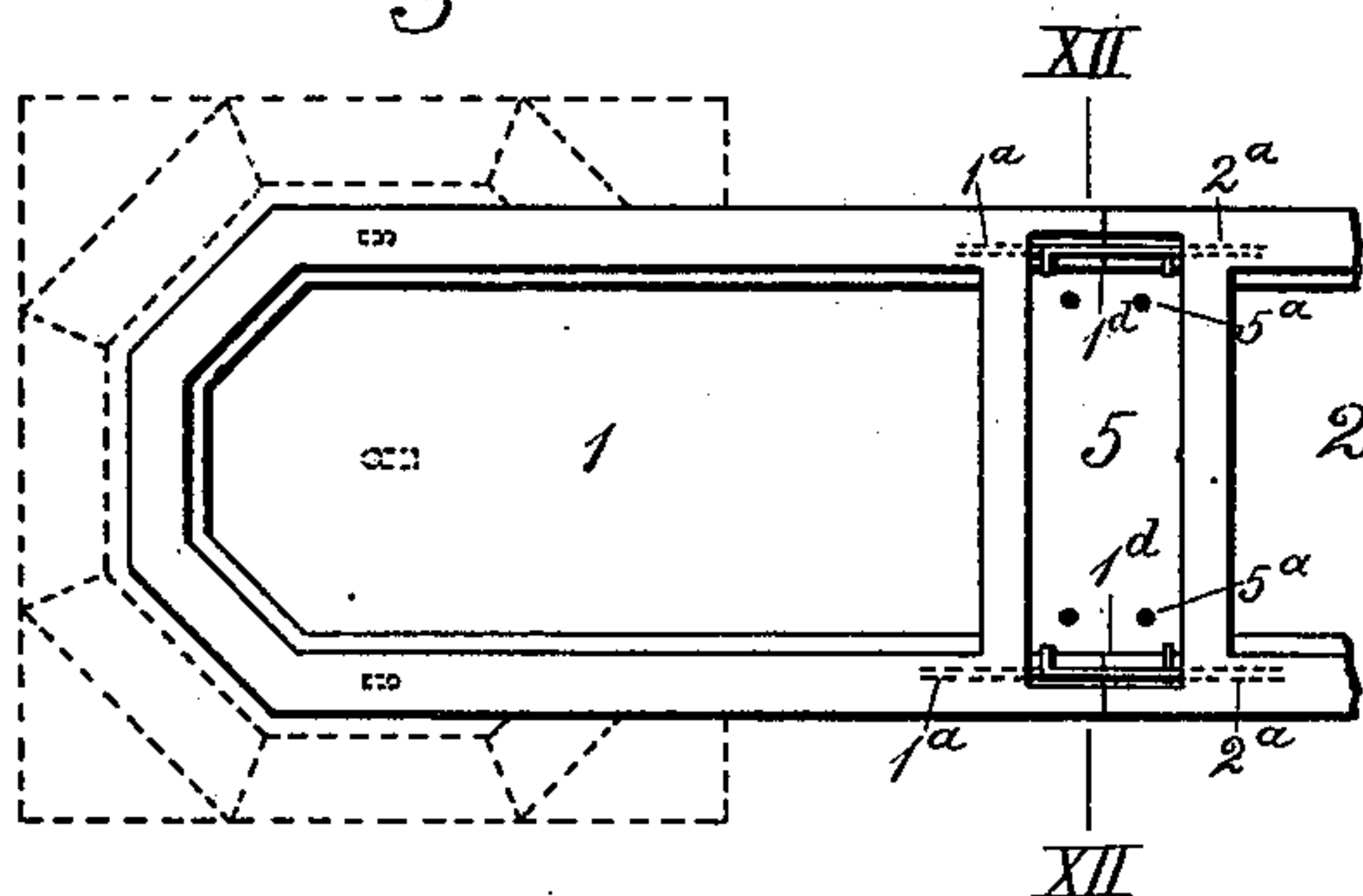


Fig. 12.

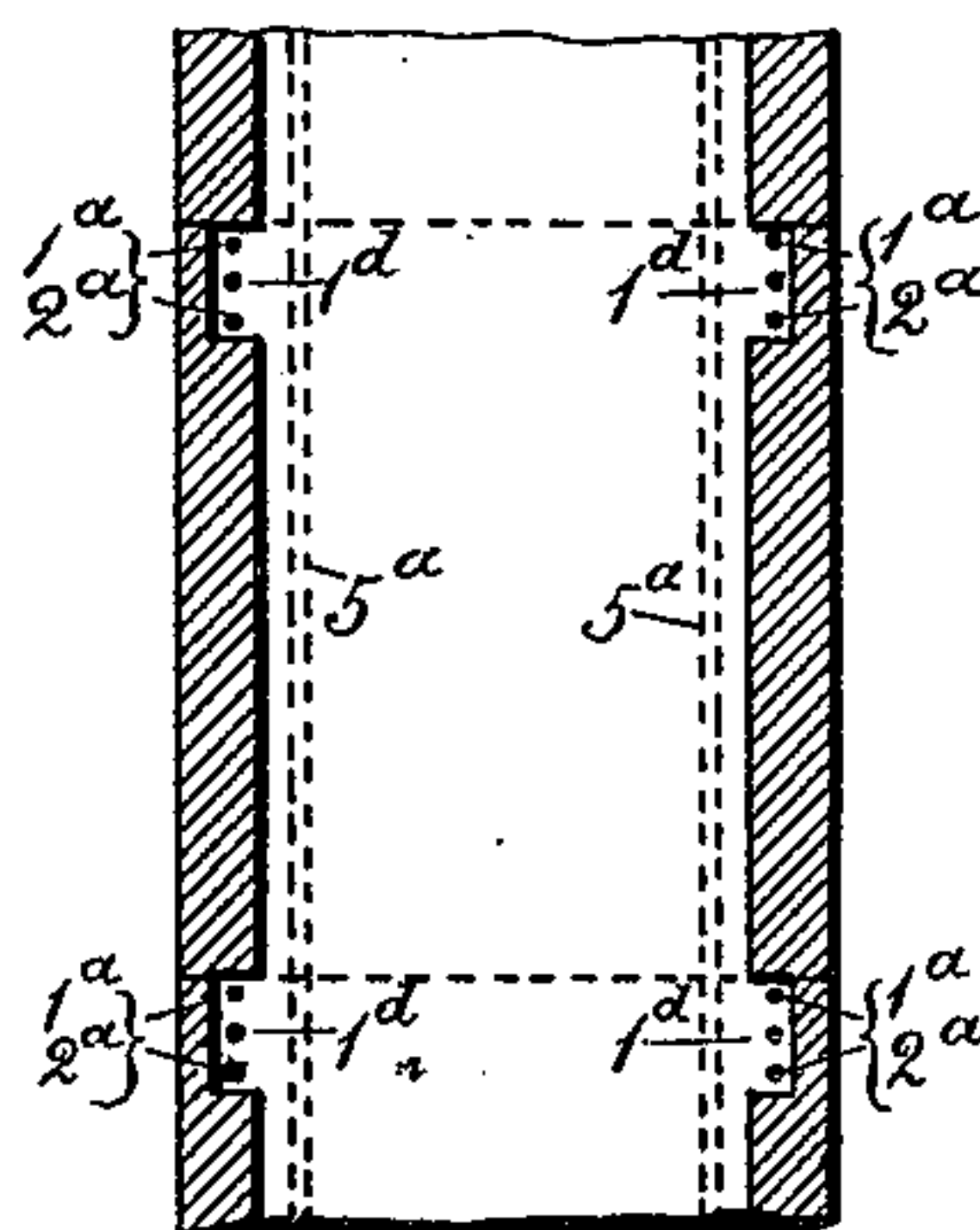


Fig. 13.

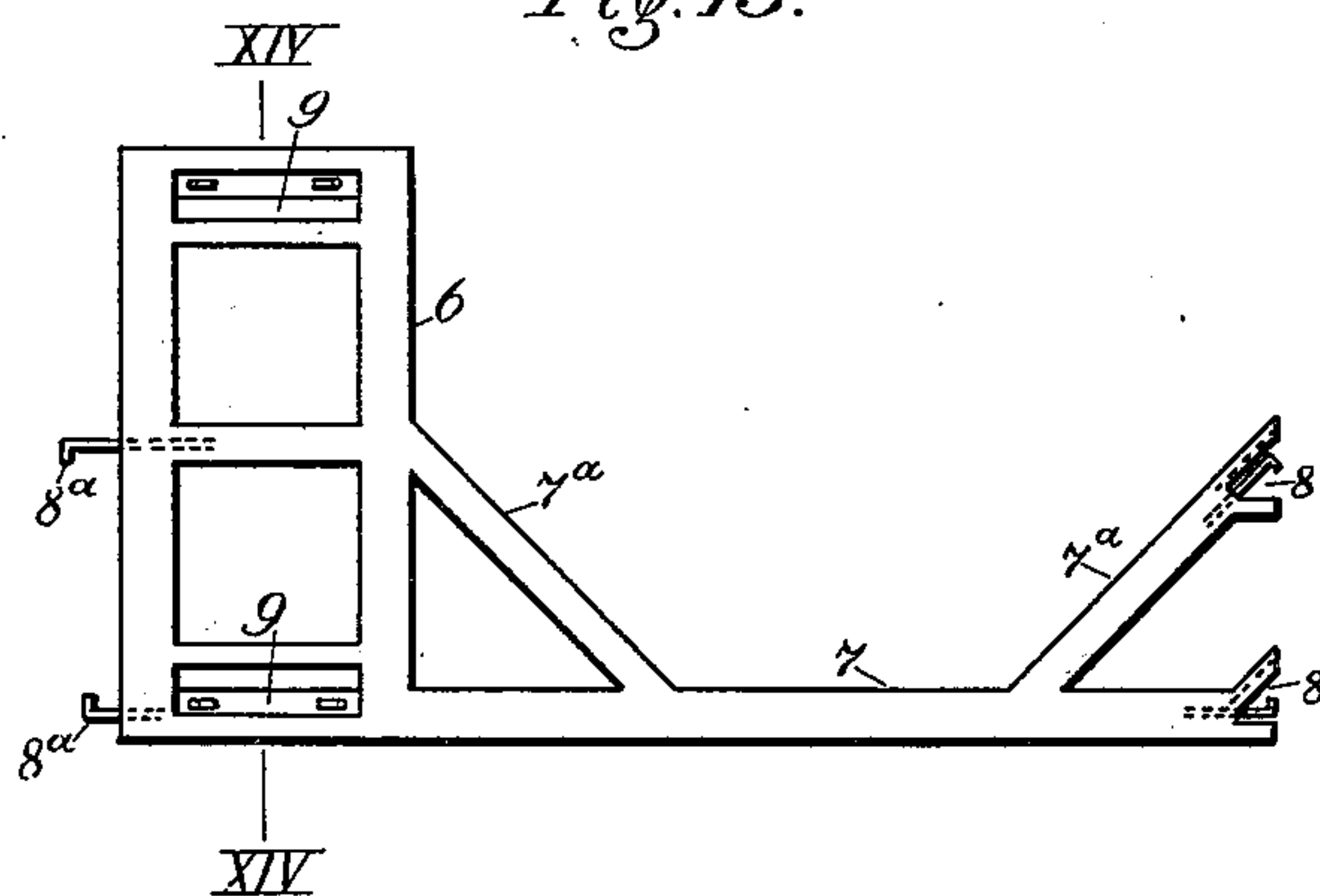
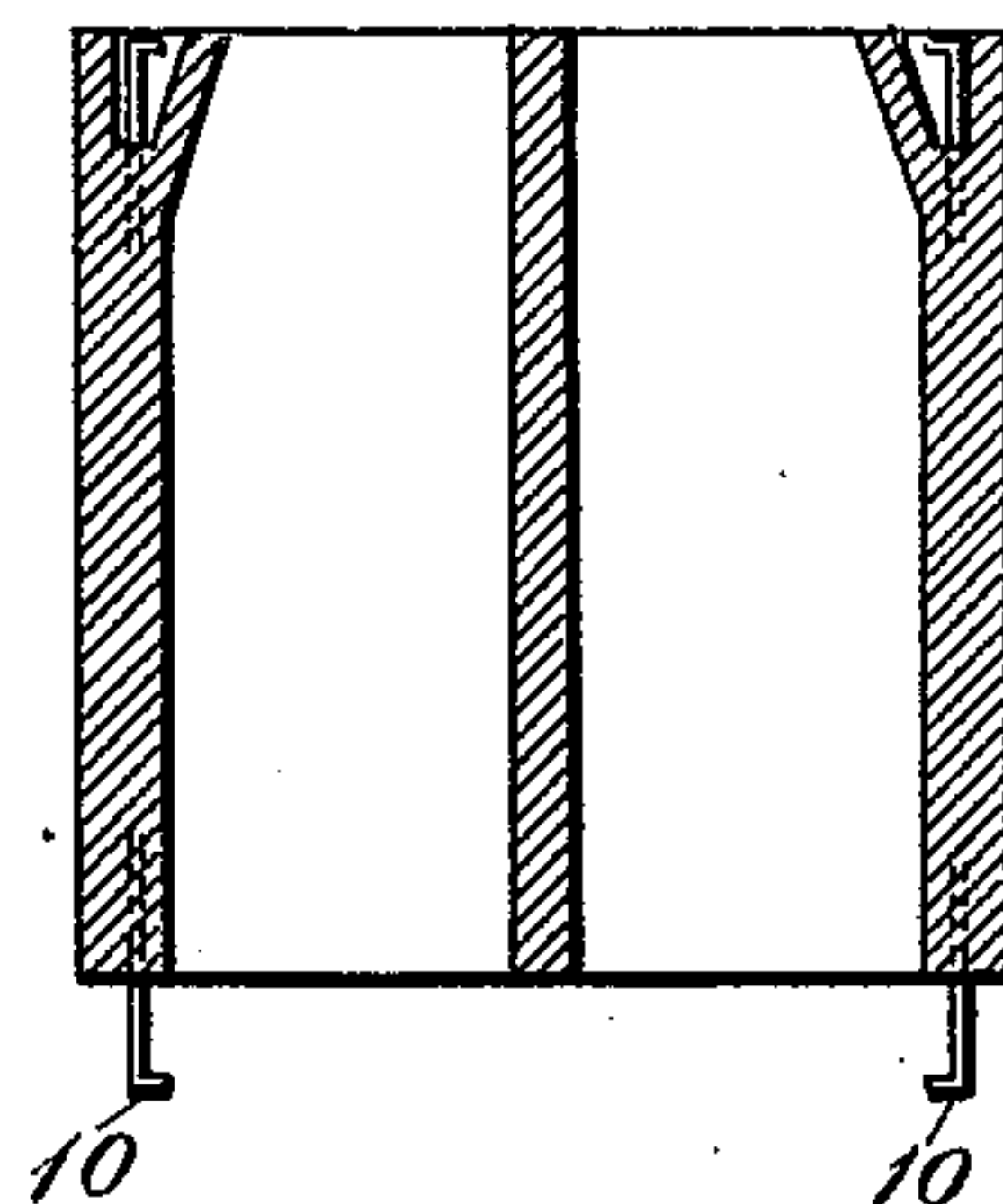


Fig. 14.



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UNITED STATES PATENT OFFICE.

FREDERICK MELBER, OF PITTSBURG, PENNSYLVANIA.

CEMENT OR CONCRETE CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 672,176, dated April 16, 1901.

Application filed May 5, 1900. Serial No. 15,600. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK MELBER, a citizen of the United States of America, and a resident of Pittsburg, county of Allegheny, State of Pennsylvania, have invented certain new and useful Improvements in Cement or Concrete Construction, of which the following is a specification.

In the drawings which form part of this specification, Figure 1 is a construction shape illustrating my union. Fig. 2 is a sectional detail of said union. Fig. 3 illustrates a modified form of the union. Fig. 4 is a sectional detail of said modified form. Figs. 5 and 6 are additional forms of said union. Figs. 7, 8, and 9 illustrate the application of my unions to construction shapes. Fig. 10 is a broken plan view of Fig. 9. Fig. 11 illustrates the application of my invention to wall building. Fig. 12 is a sectional view along the line XII XII in Fig. 11. Fig. 13 illustrates my invention applied to retaining-walls, and Fig. 14 is a sectional view along the line XIV XIV in Fig. 13.

My invention, generally stated, consists of certain new improvements in cement or concrete construction, especially in reference to the construction of building and structural shapes and their union when in place.

The application of cement or concrete to general structural purposes is attended with difficulties, owing to the character of the material, which requires expensive molds while hardening, and the fact that the hardened material while able to withstand compressive strains to a large degree is unable to withstand shearing or tensile strains. In construction of works of such material it is found much less expensive and more desirable to construct the work in sections or "shapes" at the shop and then assemble them at the place of construction. These shapes being small as compared with the entire construction can be molded with less expense for molds, &c. I show a new method of joining such shapes together, so that the complete structure is not an aggregation of individual shapes, but an integral whole.

The following is a detailed description of my invention.

1 and 2 are sections of shapes. From the side of 1, adjacent to its extremity, protrude

rod or rods 1^a, and rod or rods 2^a protrude from a lateral lip 2^b on shape 2, said protruding rods being in their embedded portion along the line of the tension strains in the shape. When said shapes are placed end to end, as shown in Fig. 2, the ends of rods 1^a and 2^a overlap, and the offset formed by the extremity of shape 1 and lip 2^b is packed with cement, covering rods 1^a and 2^a, as shown in dotted line in Fig. 2. This filling when hard and fixed becomes a solid joint or union between shapes 1 and 2. In Fig. 3 I illustrate another form of this union, which is shown in detail in Fig. 4, in which rod 1^a protrudes from the extremity instead of the side of shape 1, and between the extremity of 2 and lip 2^b is provided a wedge-shaped recess 2^c, into which protrudes the rod 2^a. When the two shapes are placed end to end to be joined, rods 1^a and 2^a both protrude into recess 2^c. This recess is then rammed full of soft cement or concrete, and when the same hardens a firm union between the two shapes is formed. In Fig. 5 I vary this union by providing the shapes with two lateral recesses or set-offs 1^d and 2^d, into which rods 1^a and 2^a protrude across the abutting ends of shapes 1 and 2, respectively. These abutting recesses are then rammed full of cement, which when hardened forms a solid and permanent joint for shapes. In Fig. 6 I lead both rods 1^a and 2^a out of the sides of the shapes, and across the abutting ends of the shapes I place a third rod 3. Over these three rods and the abutting ends of the shapes 1 and 2 I place a quantity of cement or concrete, which when hardened unites the shapes solidly. The method of preparing such shapes is well illustrated in Fig. 1, in which the top and one side surface are fitted with rods 2^a 2^a, protruding from a lateral lip, as in the case of shape 2, Fig. 2, and the remaining side showing rods 1^a 1^a protruding from the said side near the edge, also as in Fig. 2. In Fig. 7 I show a shape the abutting ends of which are arranged for the form of union shown in Fig. 5. In Fig. 8 I show a shape whose vertical edge is fitted for adjustment with the union shown in Fig. 4 and whose horizontal edges are intended for the union illustrated in Figs. 3 and 4. In Figs. 9 and 10 the ends of the shape are fitted for the form of union shown in Fig.

5, while an additional feature is the strengthening-rib 4 and rod 4^a, embedded therein, serving both to assume tension strains and at its ends 4^b and 4^c to unite abutting shapes. 5 4^d is a recess into which one extremity 4^b of rod 4^a protrudes, and when two similar shapes are placed together for union the corresponding rod extremity 4^c would protrude also into recess 4^d. This recess is then rammed with 10 cement. This serves as an additional union to that furnished by rods 1^a 2^a and recess 2^d. 4^e is a ledge on said shape, upon which the bottom of the recess 4^d of the abutting shape rests when in position for union. In Fig. 11 15 I show two abutting hollow shapes, in which 5 is a union constructed after the manner illustrated in Fig. 5, and in Fig. 12 I illustrate by a sectional view my method of building a wall of several tiers of such shapes. In 20 this case I place several tiers of shapes in position in such a manner that the abutting ends of the shapes in each tier register with the abutting ends of the shapes in the other tier. I then place rods 5^a 5^a vertically through 25 the spaces at the abutting ends. This space is then rammed full of cement. The cement is thus forced into the recesses 1^d 1^d and around rods 1^a 2^a, thus uniting shapes 1 and 2 and the filling of the registering spaces be- 30 tween the abutting end of the shapes, thus forming a union between the tiers. By this means an integral pier-wall can readily be constructed from individual shapes.

Fig. 13 shows a section of a retaining-wall, 35 in which 6 is a hollow pier, 7 the wall proper, and 7^a 7^a the braces. 8 8 are the recessed portions of unions of the design illustrated in Fig. 4, while 8^a 8^a are the rods which in an adjacent similar shape are intended to engage 40 8 8. In case a second tier of shapes are to be superimposed on the section shown I provide recessed portions 9 9 of unions, the corresponding rods 10 10 being fixed in the lower side of the shape to be superimposed, so that 45 when the shapes are in position rods 10 10 engage recesses 9 9, and thus when cement is rammed in form a solid union.

From the above it is evident that the cumbersome and expensive method of erecting 50 molds and molding the cement or concrete on

the site of the structure is effectively done away with and individual shapes substituted which have when united with my method all the strength to resist strains and solidity of an integral structure. The unions in my com- 55 pleted construction are just as able to resist the tension strains as any part of the construction, as the tension-rods run right across the junction between adjoining shapes.

While I have described minutely my invention for the sake of clearness, I do not wish to limit myself thereby, but claim broadly—

1. A union for abutting cement or concrete shapes consisting of metal embedded in said shapes along the lines of the tension strains 65 and having its ends protruding from said shapes and overlapping the abutting ends thereof, and a covering of cement fixing said overlapping ends to the shapes.

2. A union for abutting cement or concrete 70 constructions consisting of metal protruding from one of said constructions; a lateral projection adjacent to the extremity of the second construction; the forward extremity of said projection being in the same plane as the 75 forward extremity of the second construction; metal protruding from the extremity of said second construction, a covering of cement or concrete for the extremities of said metal.

3. A union for abutting cement or concrete 80 constructions consisting of metal protruding from one of said constructions; a lateral projection on said other construction; a recess between said lateral projection and the extremity of said second construction; metal 85 protruding into said recess and a filling of cement or concrete for said recess.

4. A cement or concrete construction consisting of shapes; metal rod embedded in said shapes for a portion of their lengths along the 90 lines of the tension strains and crossing the abutting ends of said shapes and a cement or concrete covering for said rod ends binding rod ends to shape, substantially as described.

Signed by me at Pittsburg, Pennsylvania, 95 this 3d day of May, 1900.

FREDERICK MELBER.

Witnesses:

J. BOYD DUFF,

EDWARD A. LAWRENCE.