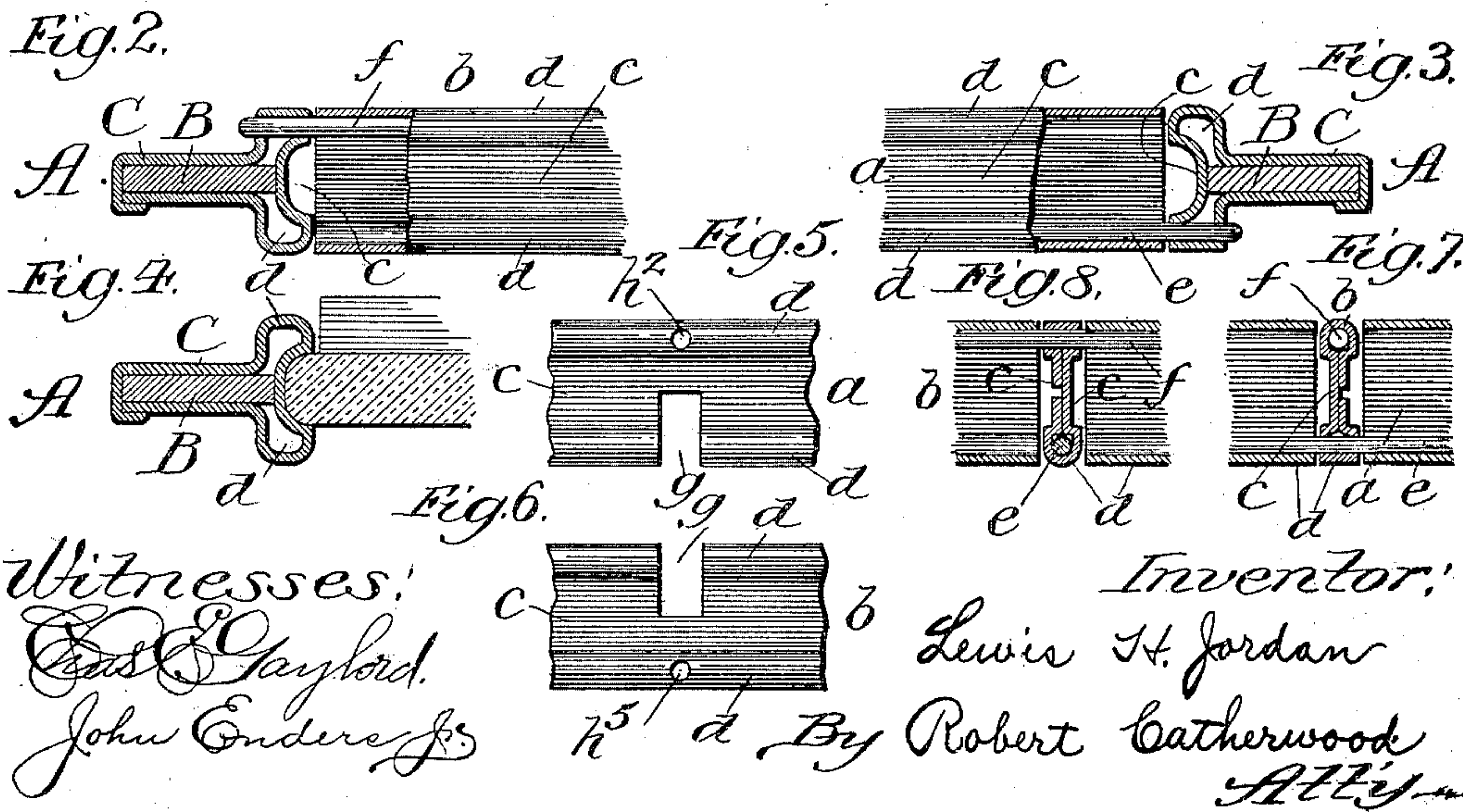
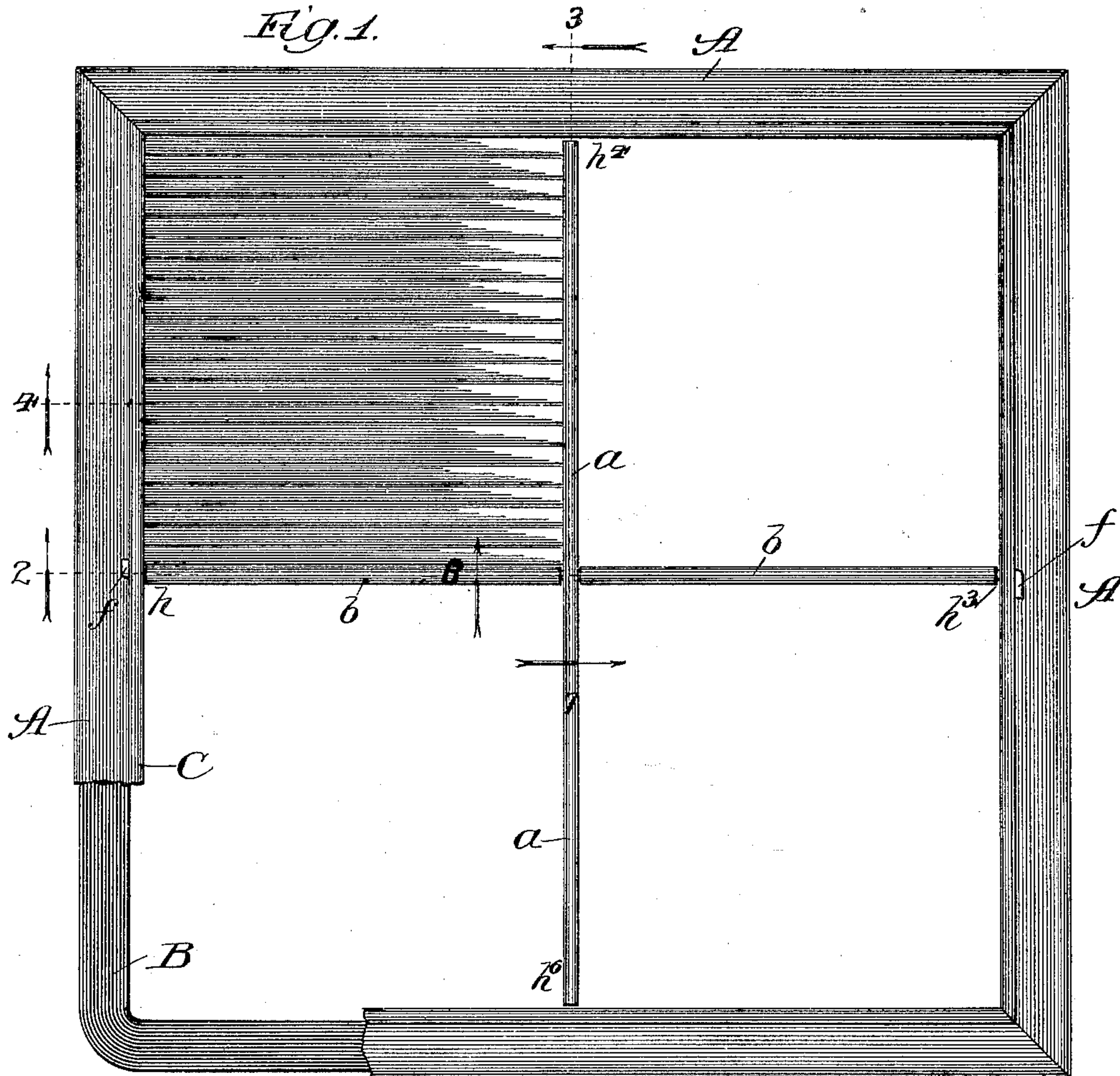


L. H. JORDAN.
SASH FRAME.

(Application filed Apr. 12, 1901.)

(No Model.)

3 Sheets—Sheet 1.

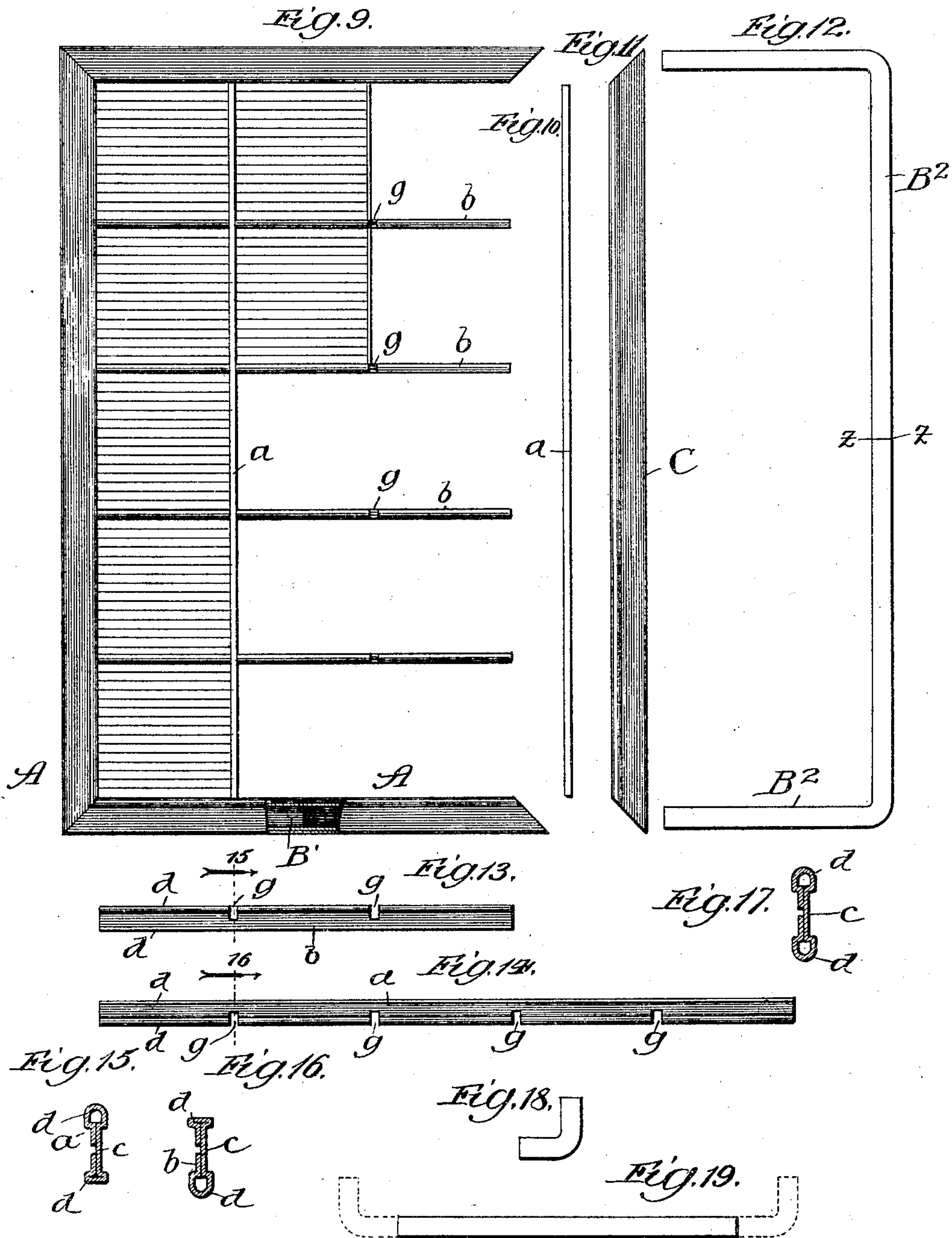


L. H. JORDAN.
SASH FRAME.

(Application filed Apr. 12, 1901.)

(No Model.)

3 Sheets—Sheet 2.



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SASH FRAME.

(Application filed Apr. 12, 1901.)

(No Model.)

3 Sheets—Sheet 3.

Fig. 20.

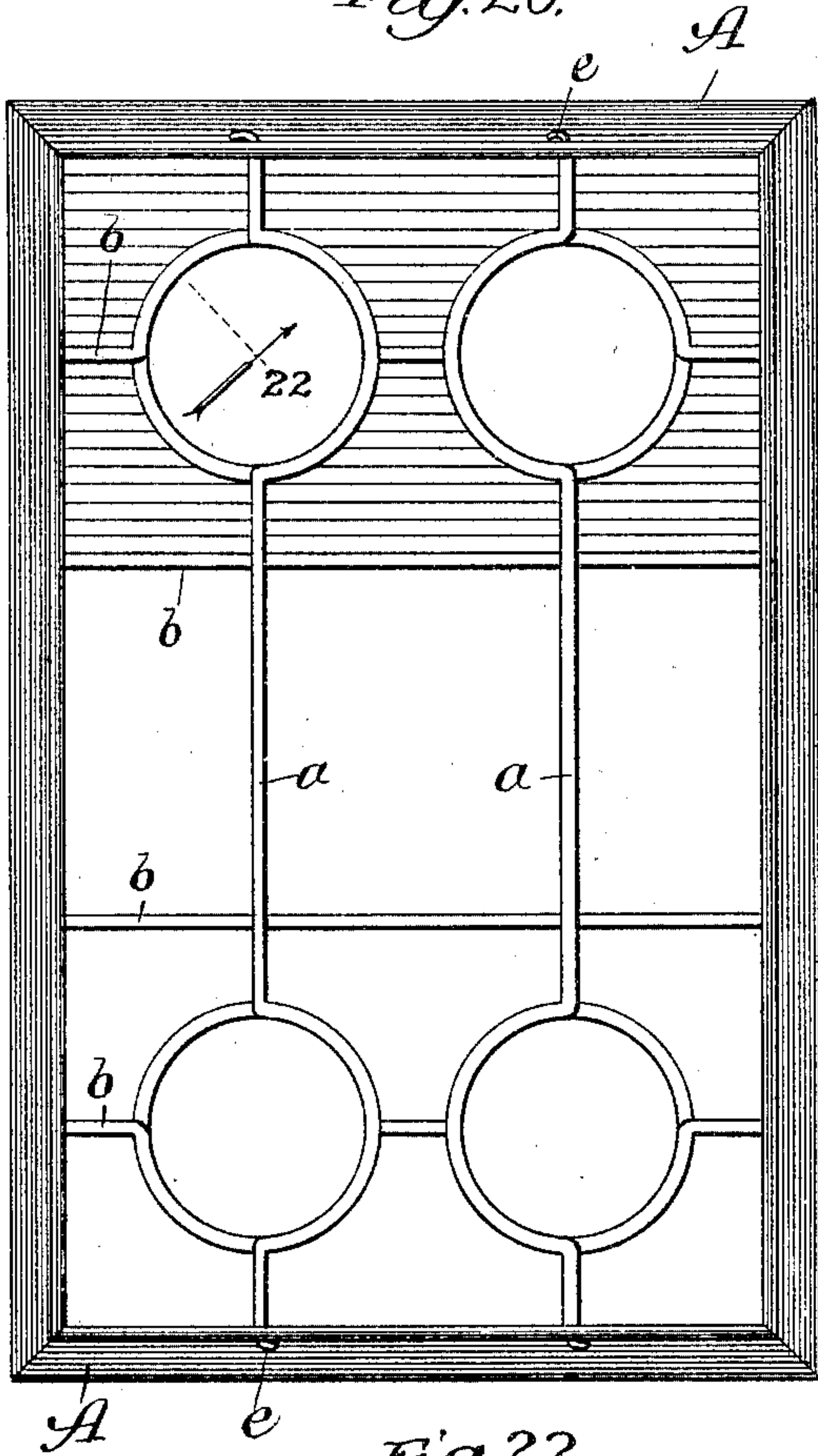


Fig. 21.

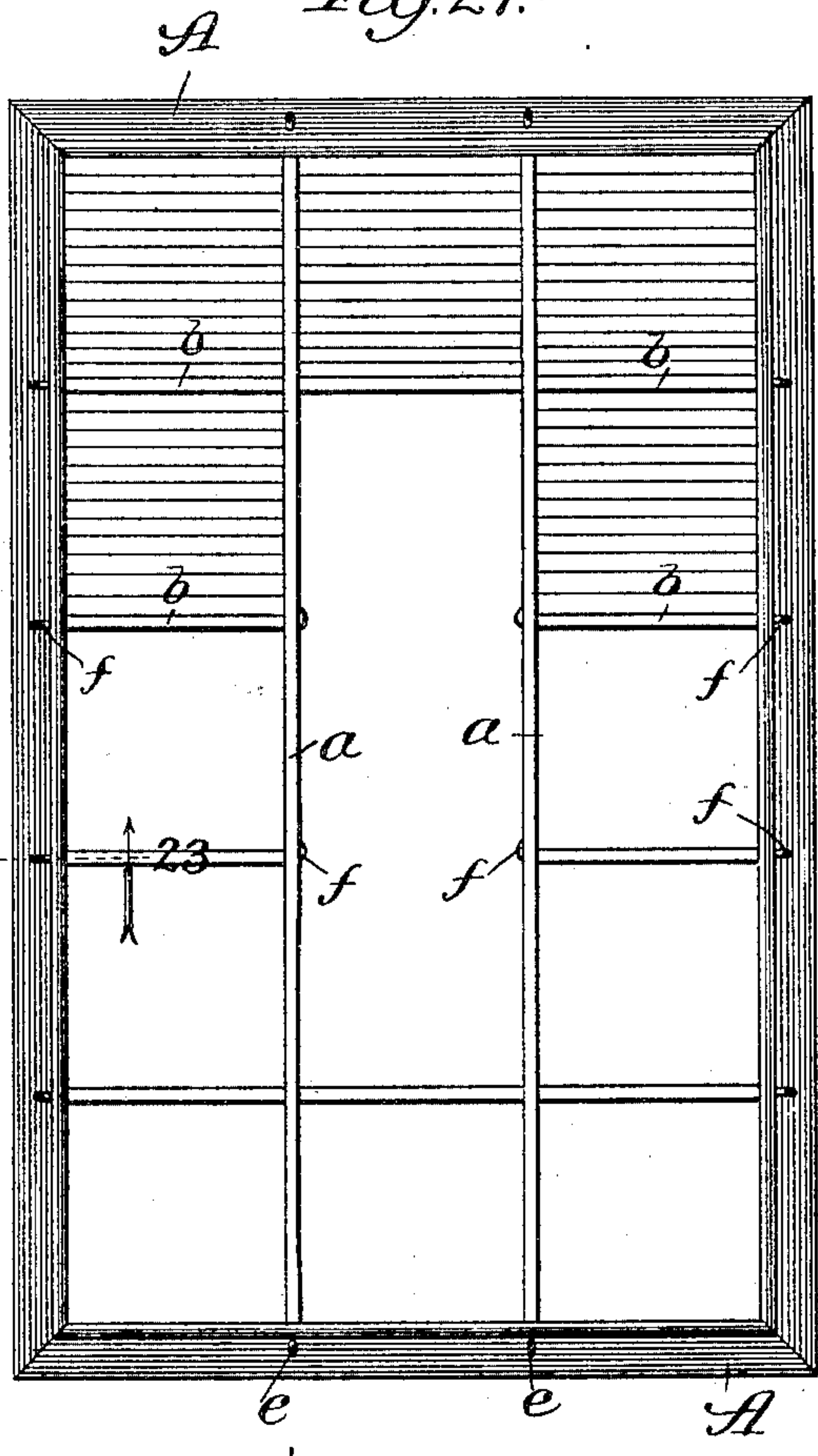


Fig. 22.

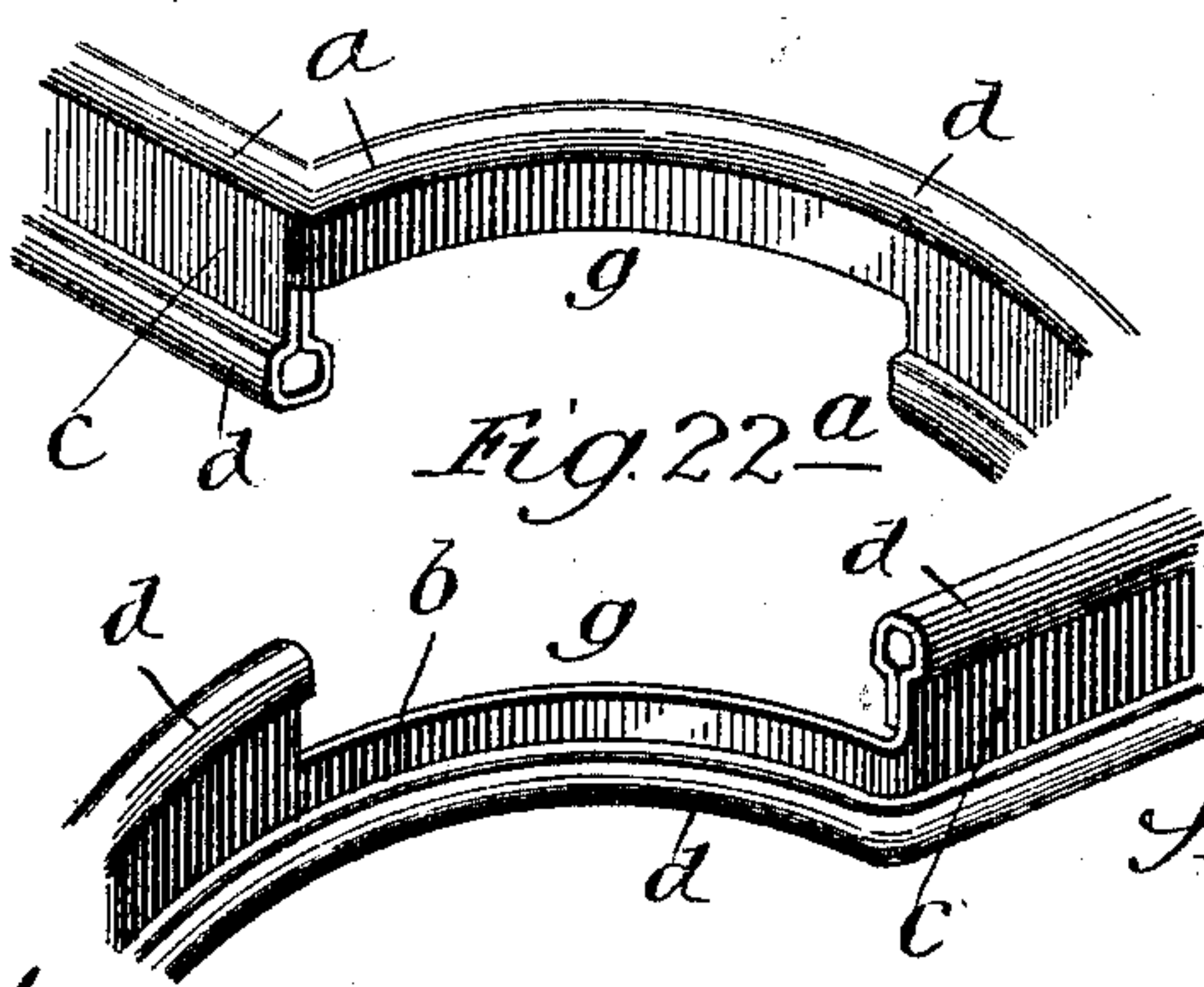


Fig. 23.

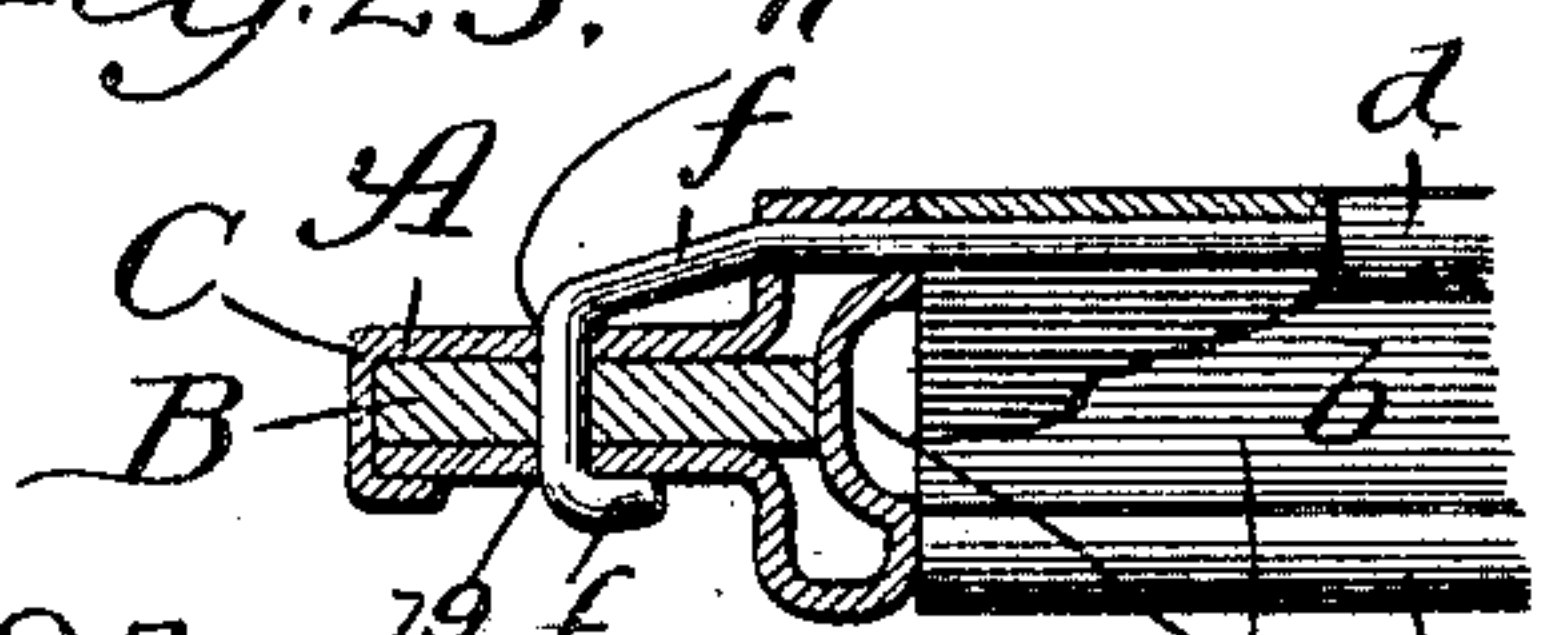


Fig. 24.

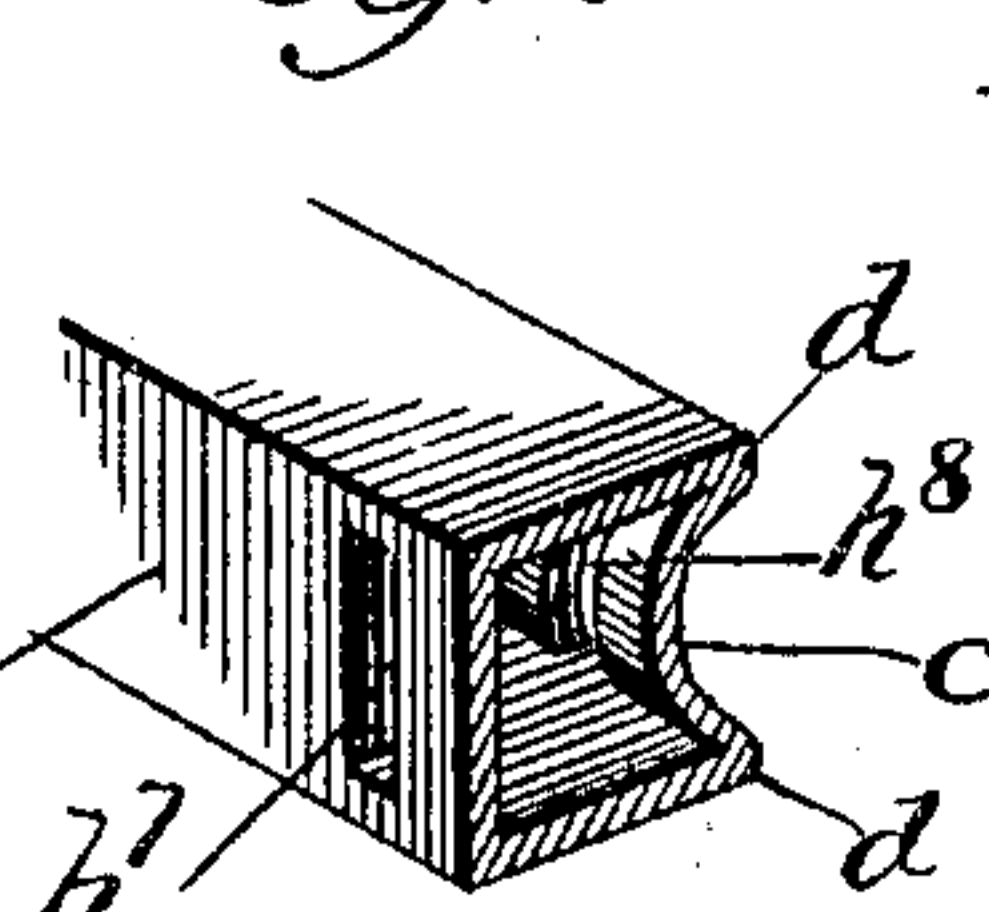
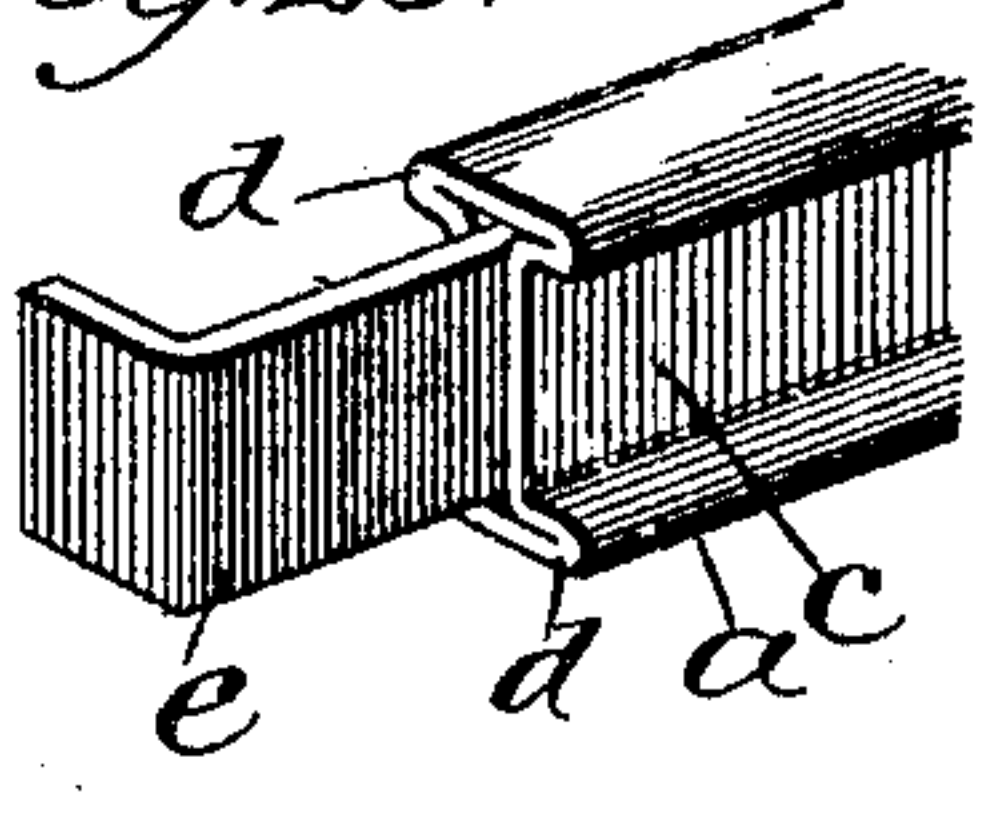


Fig. 25.



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UNITED STATES PATENT OFFICE.

LEWIS H. JORDAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO AMERICAN LUXFER PRISM CO., OF SAME PLACE.

SASH-FRAME.

SPECIFICATION forming part of Letters Patent No. 682,199, dated September 10, 1901.

Application filed April 12, 1901. Serial No. 55,532. (No model.)

To all whom it may concern:

Be it known that I, LEWIS H. JORDAN, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented a new and Improved Sash-Frame, of which the following is a specification.

My invention relates to sash-frames for framing prisms, lights, tiles, and analogous articles.

The object of my invention is to provide a sash-frame for uniting and supporting tile-like sections of prismatic, plain, or ornamental glass or analogous articles in a plate adapted to resist fire, weather, and decay which shall combine great strength and stability with the elasticity necessary to resist pressure and shock of wind and loads, while occupying the minimum of space and effectually closing by a practically tight joint the interstices between the edges of the tiles or other articles to be framed, and which can be conveniently, expeditiously, and economically constructed and put together.

My invention is particularly adapted for framing prism-tiles designed to resist great pressure or to serve as a fireproof screen or retardant, though it may be advantageously used for many other purposes.

In the accompanying illustrations, wherein like parts are denoted by like letters, Figure 1 is a front view of a sash embodying my invention having space for framing four lights, with a tile shown occupying the upper left-hand space, the other spaces being unoccupied. Fig. 2 is a cross-section through the surrounding frame on line 2 of Fig. 1, showing part of one of the grids in cross-section and part in elevation. Fig. 3 is a similar cross-section and elevation on line 3 of Fig. 1. Fig. 4 is a cross-section and elevation on line 4 of Fig. 1 of the surrounding frame and the tile. Fig. 5 is a side view of a portion of the vertical grid shown in Fig. 1, and Fig. 6 is a side view of a portion of the cross-grid in Fig. 1, near the points of intersection on each. Fig. 7 is a cross-section of the cross-grid and a side elevation of the grid shown in Fig. 1 at the point of intersection. Fig. 8 is a similar view of the grid in cross-section and the cross-grid in elevation at the point

of intersection. Figs. 9, 10, 11, 12, 13, and 14 show the parts adapted to be assembled in one sash. Fig. 9 is a front view of a sash arranged with spaces for framing fifteen tiles, the left-hand tier of tiles being shown framed in the grids, which are illustrated as loose in the frame. In the succeeding tier only two tiles are in place framed by the other frame and the two upper cross-grids. In the surrounding frame, midway between the two lower corners, a part of the outer frame is cut away to show the supporting or reinforcing frame within. Fig. 10 is a top view of the grid adapted to be interposed between the second and third tiers of tiles shown in Fig. 9, the construction being the same as that of the other grids used in the sash. Fig. 11 is a top view of the right-hand side of the outer or shell frame of Fig. 9. Fig. 12 is a top view of a portion of the reinforcing or supporting frame adapted for use in the sash shown in Fig. 9, and it may be in one piece extending through half of the entire outer frame or may be divided at Z Z or cut into a number of sections, in any case having corresponding parts extending through the other sides or corners of the outer frame. Fig. 13 is a side elevation of a cross-grid of Fig. 9, and Fig. 14 a similar view of a grid of the same figure. Fig. 15 is a cross-section of the cross-grid shown in Fig. 13, and Fig. 16 a cross-section of the grid shown in Fig. 14. Fig. 17 shows an alternative construction of a grid or cross-grid in cross-section, the distinctive feature of which is that it has a hollow bead above and below the channel, whereas the grids and cross-grids of Figs. 15 and 16 have a hollow bead on one edge and a substantially flat projection on the other edge above and below the channels. Fig. 18 shows an elbow or corner-piece of the reinforcing-frame, which may be inserted at any corner of the outer frame C in assembling the parts of a rectangular sash, there being corresponding parts to be inserted in the other corners of C, this being a modification of the reinforcing-frame illustrated in Fig. 12. Fig. 19 shows the bar which may be inserted in the frame C to fill the intervening space between the corner-pieces where using the modification illustrated in Fig. 18. Fig. 20 is a front

view of a sash embodying my invention having spaces for four circular lights or tiles, three rectangular and twelve of odd configuration following an ornamental design or pattern. Fig. 21 is a similar view showing modifications used in framing twelve square tiles about a larger oblong light. It also shows a method of gaining additional strength by further securing the ties to the reinforcing-frame. Figs. 22 and 22^a show in perspective the upper left-hand cross-grid and the left-hand grid of Fig. 20 at their points of intersection. Fig. 23 shows partly in cross-section and partly in elevation a cross-grid of Fig. 21 and shows more particularly the method of securing the tie to the reinforcing-frame. Figs. 24 and 25 illustrate a modification of the outer frame and grid adapted to a flat tie or band, by which some of the advantages of my invention may be secured.

My invention is adapted for use in sashes which include within the surrounding frame various shapes and sizes and any desired number of tiles or analogous articles to be framed.

In the drawings, A is a surrounding frame consisting of a reinforcing or supporting frame B and an outer or shell frame C, constructed, preferably, of copper or other refractory metal, by which I mean a metal capable of withstanding a high degree of heat.

The reinforcing-frame B is composed of four parts, the parts B' being shown in Fig. 9 and the parts B² in Fig. 12, though when less strength is required elbows or corner-pieces, as illustrated in Fig. 18, may be used with or without the intervening bars shown in Fig. 19, or the reinforcing-frame may be dispensed with altogether and other methods of uniting the corners of the frame employed.

Across the frame A, interposed between and embracing the tiles of the completed sash, are a series of grids or nets constructed as hereinafter described. I denote the vertical grids by *a* and the transverse or cross grids by *b*, using the terms "vertical" and "transverse" with reference to the sashes shown in Figs. 1, 9, and 20, though it is obvious they may be used in any desired plane. The grids, cross-grids, and frame are provided with channels or grooves *c*, adapted to engage the edges of the tiles snugly and have beads *d* above and below the channels *c*. Through the lower beads of the vertical grids and the upper beads of the transverse grids are inserted the ties *e* through *a* and the ties *f* through *b*, each secured at the ends to the surrounding frame in any suitable manner—for instance, as shown in Fig. 1, where the ties are of sufficient length to project through small eyes or openings in the outer frame C, *h*¹ *h*³ in alignment with *f*, and *h*⁴ *h*⁶ in alignment with *e*, the ends being bent at right angles to secure them, or, for instance, as shown in Fig. 23, where the eye or opening *h*⁹ is made through both the outer frame C and the supporting-frame B, this method of securing the

ties giving greater strength to the sash than where they are fastened only to frame C. By the means above described the grids and cross-grids are firmly locked about the respective tiles, lights, or other articles to be framed in the manner described and the parts of the surrounding frame joined securely together.

The ties above described and the openings for their reception may be of any suitable shape or size. They may be flat, round wires, or rods or of other cross-section, and where less strength is required some advantages of my invention may be obtained by using ties in a portion only of the grids—as, for instance, only in the grids running one way or extending only part way through the sash and tied at intersecting grids. Where it is desired to provide a sash for a narrow aperture, I sometimes construct the grids running the short way of the frame hollow throughout and use flat or ribbon ties—such, for instance, as shown in Fig. 25. These ribbon-shaped ties or tie-rods may be secured to the frame in any suitable manner—as, for instance, by drawing the ends through openings, such as *h*⁷ and *h*⁸ of Fig. 24, and bending at right angles.

It is sometimes desirable to give certain tiers of lights or tiles greater strength than others—as, for instance, where it is desirable to brace the outer lights or tiles of a frame, leaving those in the central portion with a greater degree of elasticity. In such cases I use in the sash grids with the two hollow beads above described and insert in the unoccupied bead between the outer frame and the first intersecting grid a rigid tie headed at the ends and butting against the grid and frame. This method of bracing can be used in other parts of the frame wherever additional strength is required.

The ties may be secured to the surrounding frame in other ways than that illustrated, provided they be so secured thereto as to firmly tie together the grids and the surrounding frame in appropriate relative positions.

The ties and reinforcing-frame used in my sash are preferably composed of iron, steel, or other metal having the desired strength and adapted to be suitably bent, coated with tin or other substance that will prevent corrosion, and yet not coact with the copper to form a battery.

In the construction illustrated in Figs. 1, 5, 6, 7, and 8 the grids *a* and *b* are shown with the tie *e* penetrating the lower bead of cross-grid *b* through the hole *h*⁵ and the tie *f* penetrating the upper bead of the grid *a* through the hole *h*². In this construction the tiles are held in place, the parts of frame B bound together, and the grids and cross-grids interlocked and tied together positively at each intersection against strains in every direction. I prefer to construct these grids and cross-grids each of one sheet of copper

or suitable fire-resisting material, bent to form the channel and the beads, as shown in Figs. 15, 16, and 17 and also in Figs. 7 and 8. It is only necessary to have one hollow
5 bead or space for the tie in each grid or cross-grid, while providing suitable projection along the edges to properly confine the tiles; but I prefer the tubular beads on each edge.

In the alternative construction of grids shown in Figs. 15 and 16 only the upper bead of *b* and the lower bead of *a* are hollow, the other bead being flat or of any shape to hold in engagement the edges of the tiles in the channels *c*. The grids and cross-grids are
15 halved together at their intersections, the notches for that purpose being denoted by the letter *g*, as shown in Figs. 5 and 6. This halving of the grids at their intersections with the cross-grids may be upon the same
20 side, or it may be upon first one side and then the other, the halving of the cross-grids alternating oppositely thereto and making an under and over woven mesh of grids in the sash.

In the sash-frame shown in Fig. 20 the halving of the intersecting grids at the right-angular intersections is the same as that just described; but where they are bent about to form the spaces for the circular tiles or lights
30 the line of intersection occupies one-quarter of the circumference of each circular space and the notches have to be extended correspondingly. These intersecting grids embracing three of the quadrants will sufficiently confine the tiles, and it is not necessary to fill the fourth quadrant unless for the purpose of appearance. It may be filled, as
35 illustrated, by inserting and cementing or otherwise securing a section corresponding in outline with the grids and giving the effect of a frame extending entirely around the tiles.

In assembling the parts to construct a sash like that illustrated in Fig. 9, for which the parts shown in Figs. 10, 11, 12, 13, and 14 are
45 adapted, I take one side of the frame C and insert therein an end of one of the elbows or corner-pieces of frame B. For illustration, suppose that the side selected is the lower side shown in Fig. 9 and the corner-piece or elbow
50 B'. I next slide the left-hand side of C over the elbow B' into contact with the lower side of C, insert the elbow B', and slide the upper side of C over the end of the elbow protruding from the left-hand side of frame C. I now
55 have three sides of the surrounding frame in position. I next place the upper left-hand tile in position in engagement on two sides with the channel of C, insert the top cross-grid *b*, and in this manner complete the left-hand tier of tiles, the cross-grids being unse-
60 cured, for the present, to the frame C. Pushing the tiles snugly in engagement with the channels of C, I place the first vertical grid in position, and so on in like manner I insert the full number of tiles and vertical grids, which in the sash shown in Fig. 9 is fifteen

of the former and two of the latter. I then pass one end of each of the two remaining elbows or corner-pieces of B into the right-hand side of C, insert the protruding ends of
70 the elbows in the upper and lower sides of C, and bring this last side of C into close contact with the upper and lower sides and into engagement with the tiles of the right-hand tier. I then lock all the parts together tightly
75 and securely by inserting the wires or ties *e* and cross-ties *f* and drawing them through the proper eyes and securing them at the ends in any suitable manner firmly to frame C. When using the modification in which the
80 ties are inserted through the edge of the grid opposite the notched edge, the ties may be inserted before the grids are placed and afterward secured to the outer frame C. In either
85 case the tiles and grids may be united in position before any part of the outer frame is applied. It is obvious that these methods of assembling and uniting the parts, while convenient, may be varied in some respects without departing from the principle of my inven-
90 tion.

I have found it advantageous to heat the ties before inserting them in the beads, drawing and securing them to the frame while hot, the contraction ensuing making a tighter
95 joint than when the ties are inserted cold. In order to perfectly seal the joints, solder or cement of any kind or deposition may be used; but this is not required to give strength and stability, and if a solder or cement which
100 is not fireproof should be used the stability and efficiency of the plate and its capacity to serve as a fire-wall will not be destroyed by the melting of such sealing material.

What I claim, and desire to secure by Letters Patent, is—

1. In a sash-frame having intersecting grids halved together and laterally channeled for engagement with the edges of the tiles to be framed, beads on opposite edges of intersect-
110 ing grids, a surrounding frame inwardly channeled for engagement with said tiles, and ties extending through beads on the opposite edges of intersecting grids secured at the ends to said frame whereby the several parts are
115 locked together, for the purposes described.

2. A sash-frame having intersecting grids halved together and provided with beads to engage the edges of the tiles to be framed, a surrounding frame, ties secured at their ends
120 to said surrounding frame passing through the bead of said grids on their halved edge and penetrating the bead of the intersecting grids, whereby the grids and cross-grids are interlocked at their intersections, for the pur-
125 poses described.

3. A sash-frame having a surrounding frame and a series of interlocking grids extending continuously from side to side thereof halved together and having parallel beads,
130 one on each edge constituting channels adapted to engage the plates to be framed, and ties

securing said intersecting grids to each other and grids to the surrounding frame, for the purposes described.

- 5 4. In a sash-frame, a surrounding frame composed of an outer shell and internal reinforcing-bars having elbows extending around the corners of said frame, intersecting grids halved together and tied to said surrounding

frame, said ties, grids and surrounding frame and reinforcing-bars being of refractory material, for the purposes described. 10

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