

(No Model.)

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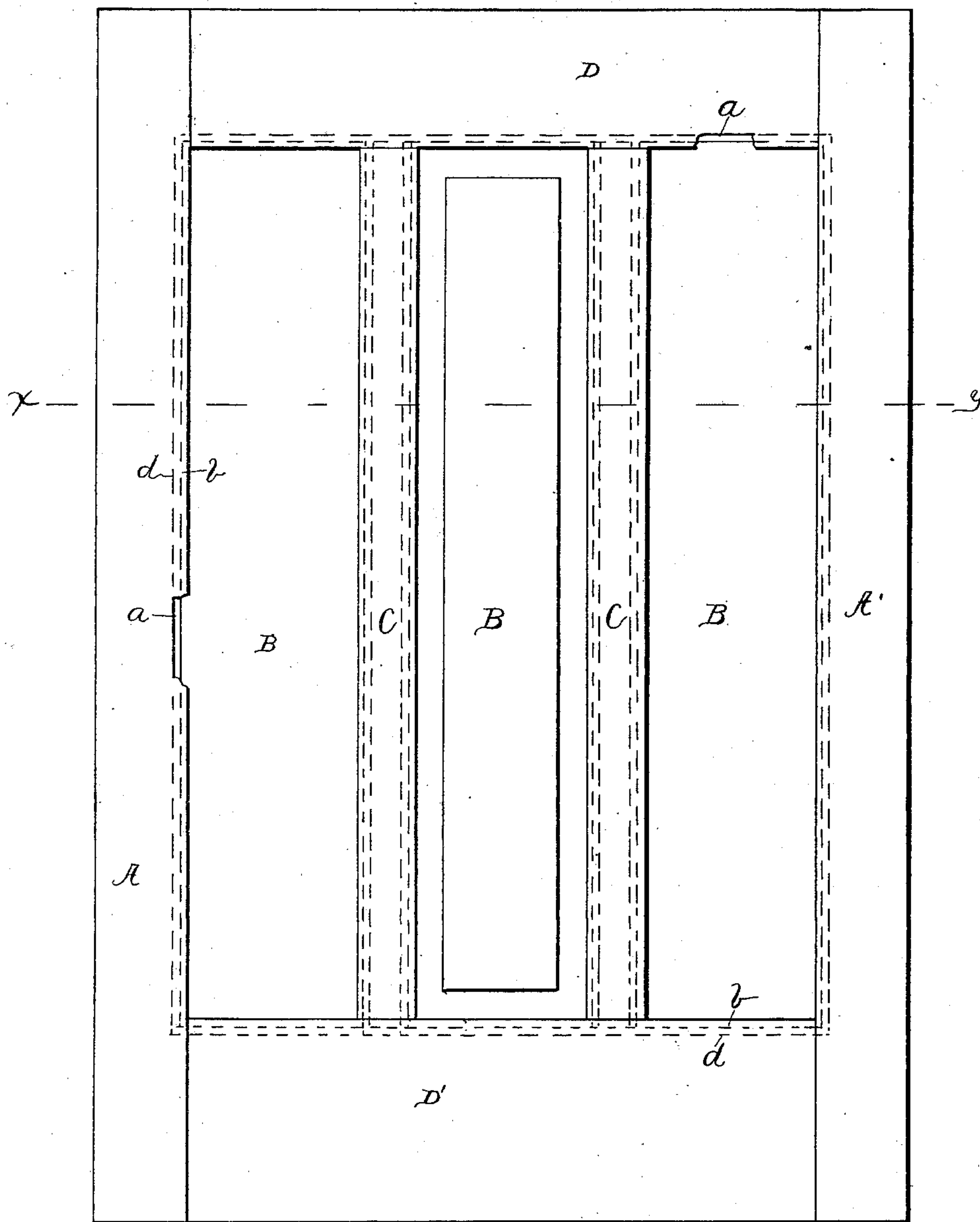
E. BELDEN.

DOOR OR SHUTTER.

No. 315,111.

Patented Apr. 7, 1885.

Fig. 1.



WITNESS:

WITNESSES:
Chas. H. Hallister Jr.
A. Daubens

INVENTOR

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Emerson Beldin
BY
Geo. A. Mosher
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

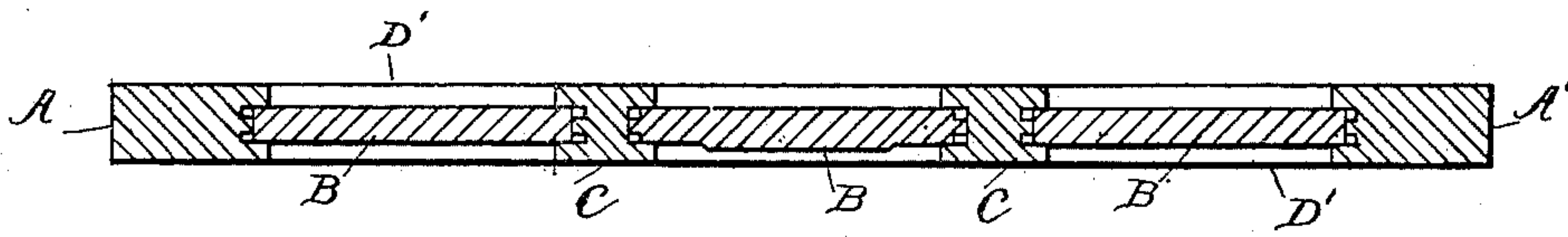


Fig. 3.

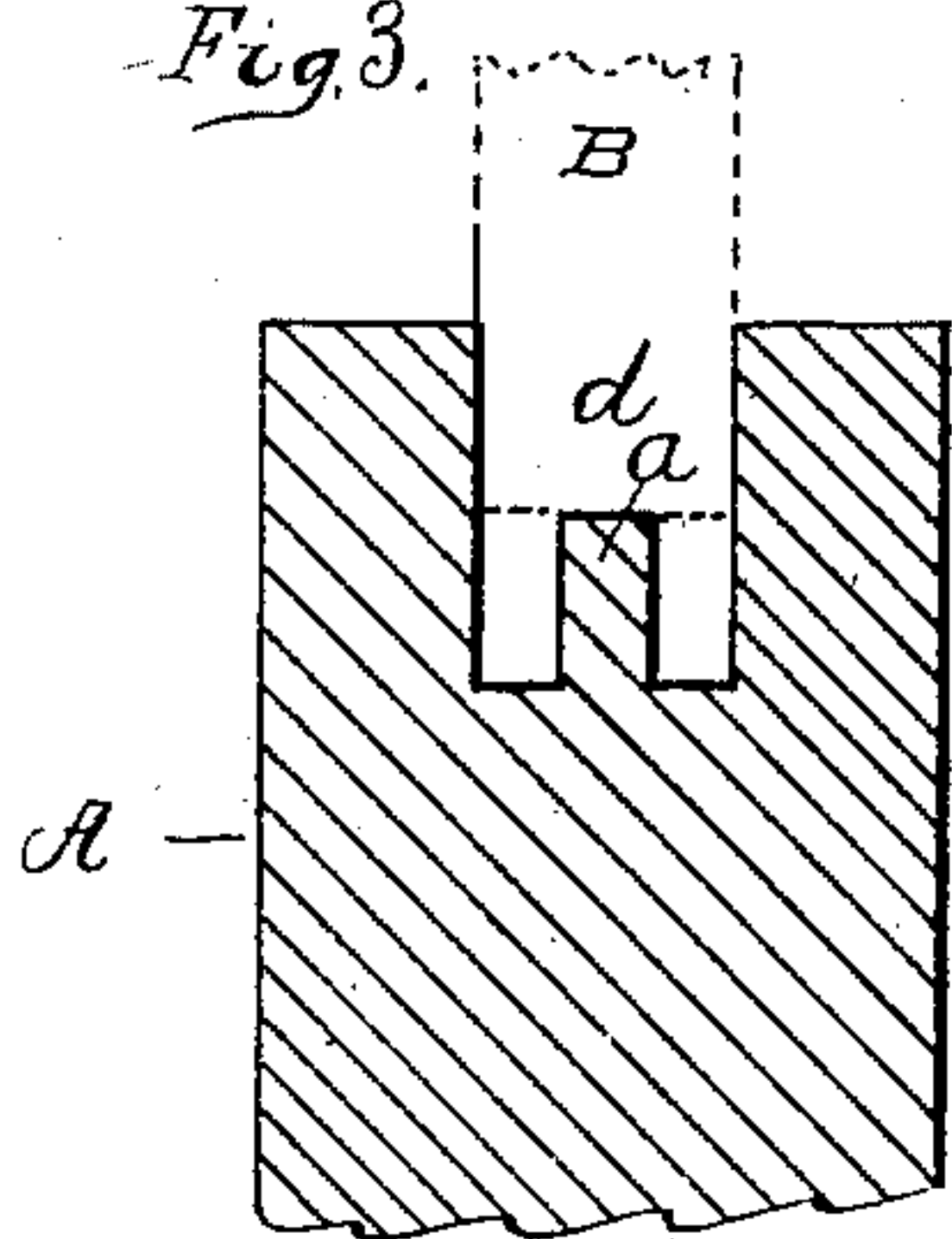


Fig. 4.

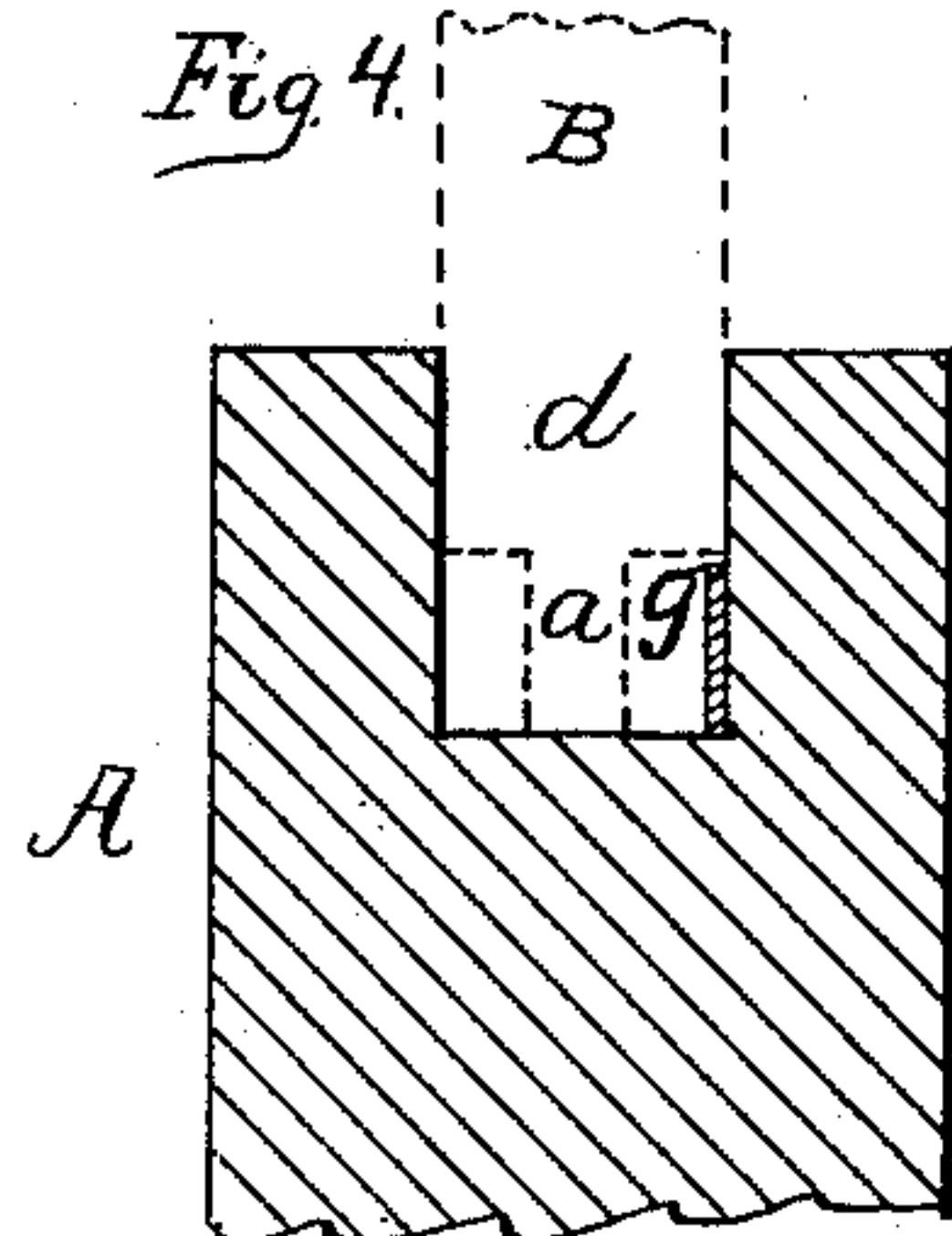


Fig. 5.

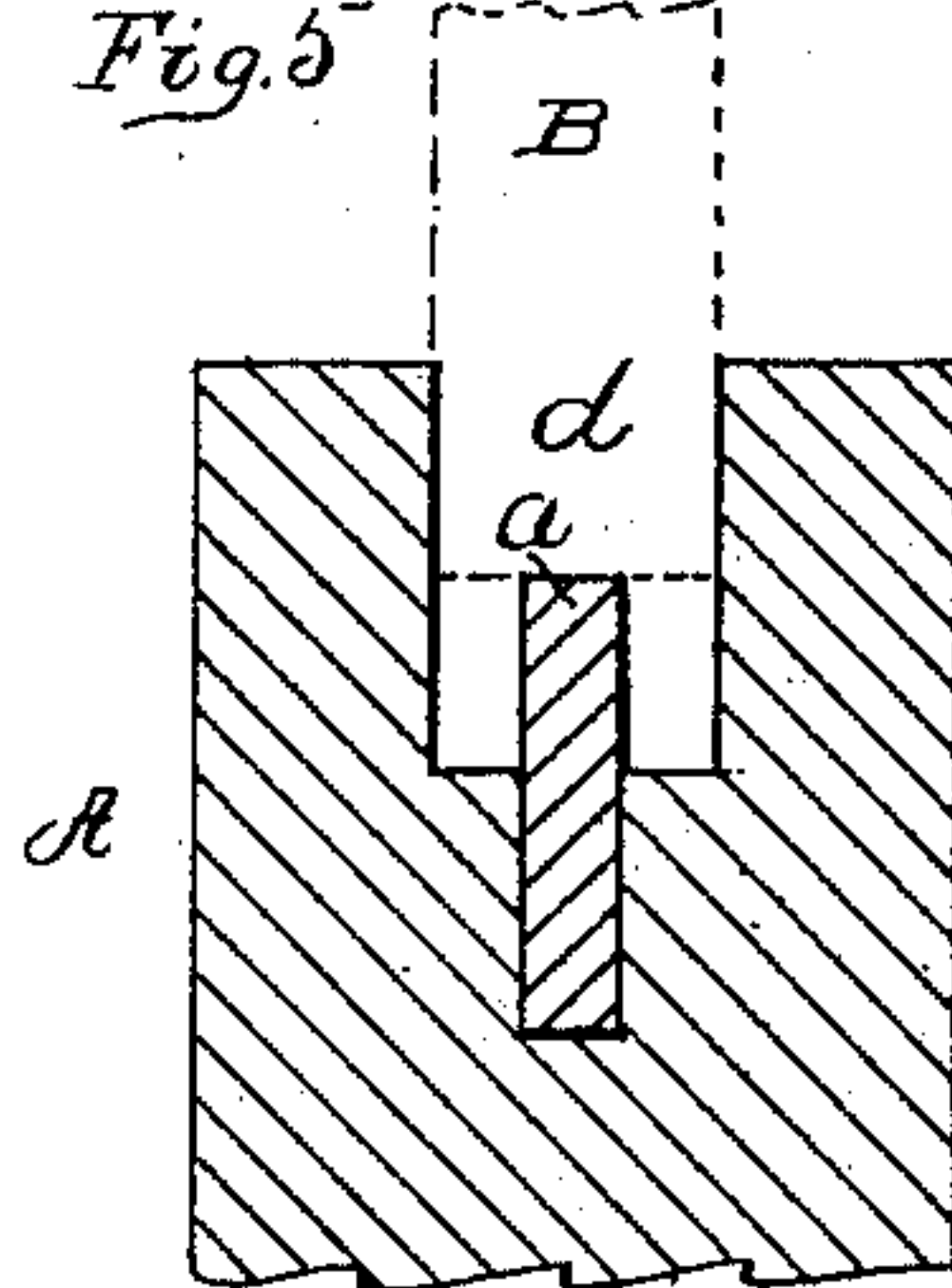


Fig. 6.

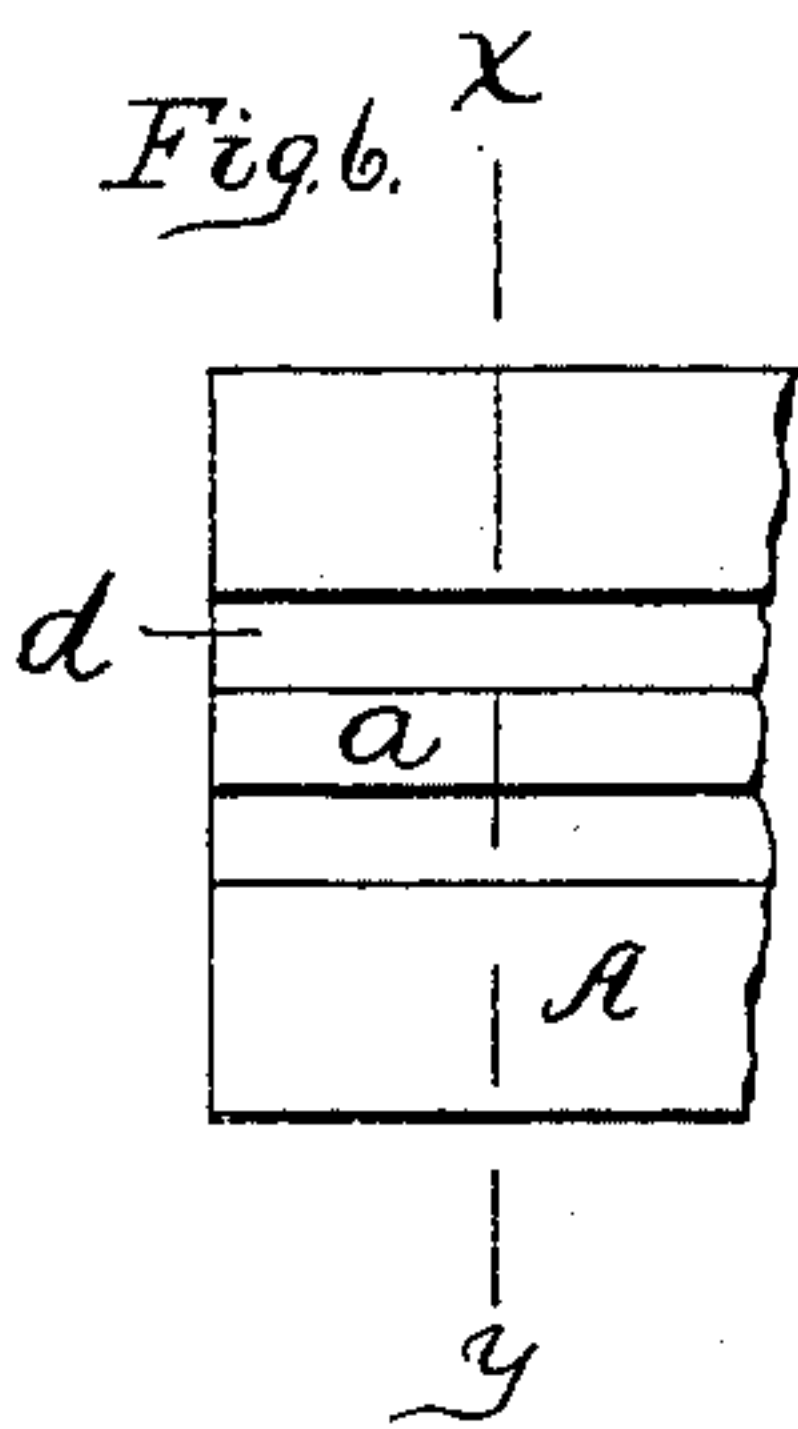


Fig. 7.

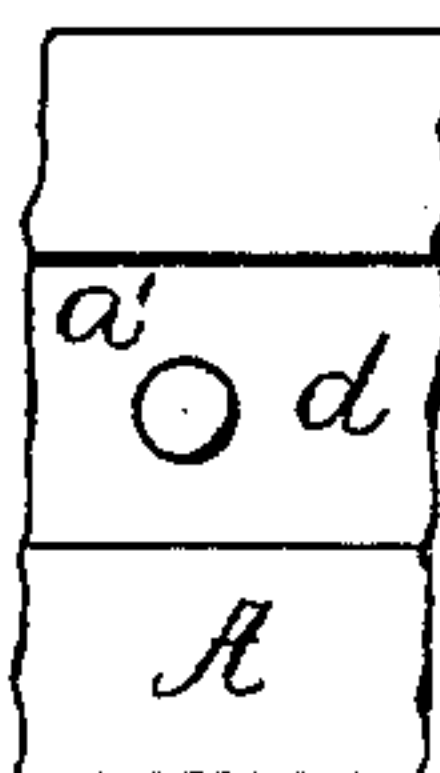


Fig. 8.

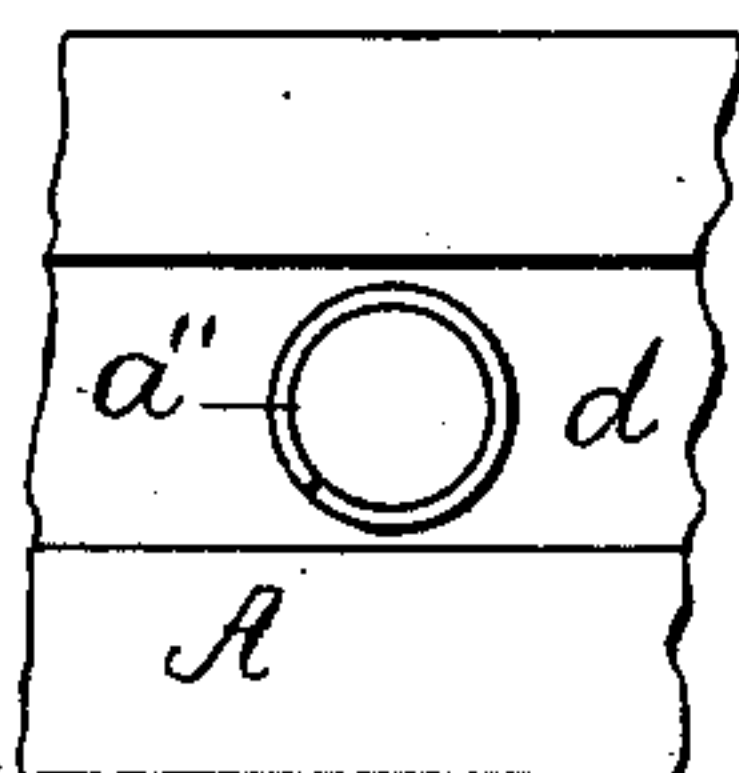


Fig. 9.

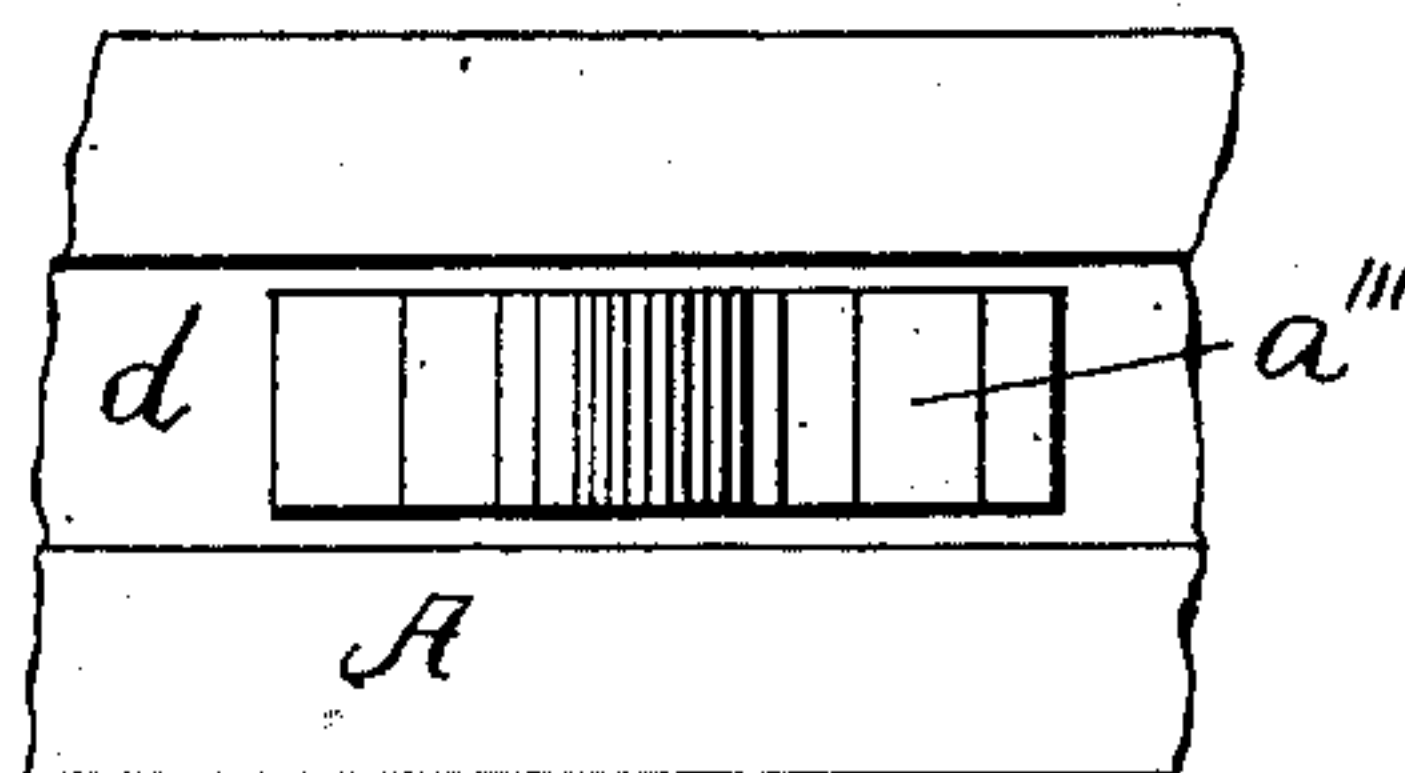
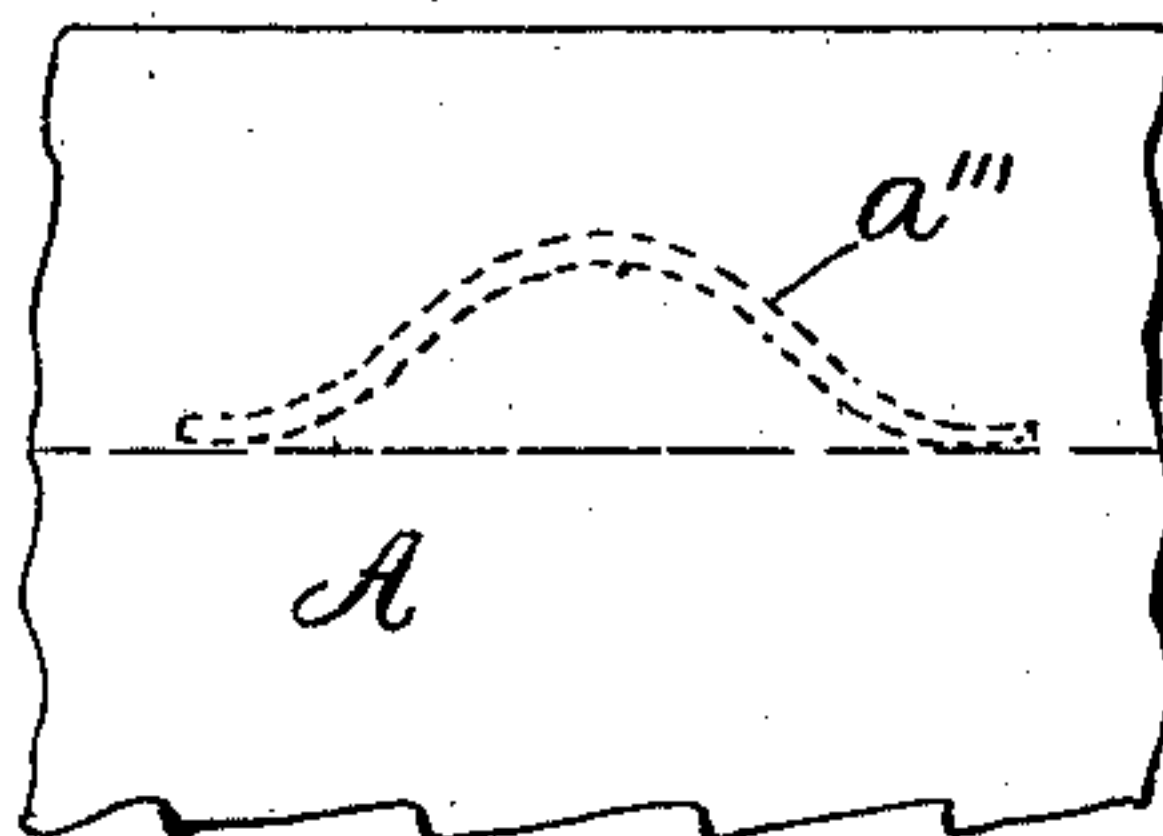


Fig. 10.



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UNITED STATES PATENT OFFICE.

EMERSON BELDEN, OF GREEN ISLAND, NEW YORK, ASSIGNOR OF ONE-HALF TO ALBERT CRAMPTON, OF SAME PLACE.

DOOR OR SHUTTER.

SPECIFICATION forming part of Letters Patent No. 315,111, dated April 7, 1885.

Application filed December 19, 1884. (No model.)

To all whom it may concern:

Be it known that I, EMERSON BELDEN, a resident of Green Island, in the county of Albany and State of New York, have invented certain new and useful Improvements in Doors and Shutters; and I do hereby declare that the following is a full, clear, and exact description of the invention, that will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures therein.

My invention relates to improvements in doors and shutters, and more particularly to the adjustment and retention in place of the panels and mullions therein.

The objects of my invention are, first, in the manufacture of doors and shutters, to easily and quickly adjust the panels and mullions in their proper position; second, to provide for the expansion and contraction of panels and mullions without injury to the doors or shutters or change of the relative position of panels, mullions, stiles, or rails; third, to effect a saving in the quantity of material required for the manufacture of doors and shutters.

My invention consists in providing a yielding fillet or tongue to separate the inclosed edges of a panel or mullion from the bottom of its inclosing-groove within the edges of the stiles, rails, or mullions.

Figure 1 of the drawings is a side elevation of a door, or section of a door or shutter. Fig. 2 is a cross-section of same, somewhat exaggerated in thickness, taken at the broken line $x y$ in Fig. 1. Fig. 3 is a cross-section of one of the stiles, taken at broken line $x y$ in Fig. 6, showing position of fillet a , and in dotted lines the relative position of an inclosed edge of a panel. Figs. 4 and 5 are similar cross-sectional views showing modified forms of the fillet. Fig. 6 is a plan view of the groove and inclosed fillet in a short portion of a stile. Figs. 7, 8, and 9 are similar plan views showing modified forms of the fillet. Fig. 10 is a side view of parts shown in Fig. 9.

Fig. 1 represents in general form of construction an ordinary three-panel door in which the uprights or stiles $A A'$ are securely connected by the top and bottom rails, D and D' , the space therein inclosed being filled in with the panels B and connecting-mullions C .

It is well known that wood, and especially the light and soft woods of which the greater number of doors are constructed, is considerably affected by the humidity of the atmosphere, which is in a large degree changeable. When moisture is absorbed from the atmosphere or other sources, wood swells and expands, and when the moisture is evaporated and expelled from the wood it contracts. The expansion and contraction laterally of the grain of the wood is much greater than its longitudinal expansion. The rails which connect the stiles at their ends, and, usually, at their middle parts also, are necessarily constructed with the grain of the wood extending longitudinally of the rails from stile to stile, while the inclosure within the stiles and rails is filled with the panels and mullions, all placed side by side with the stiles and with each other, with the grain of each part running in the same direction, and the panels of a door, being thinner than the other parts, are more sensitive to atmospheric changes. Consequently some allowance must be made for the unequal expansion of the parts, or the panels will bend so as to "concave" or "convex," or will force the stiles from the rails, or both, and for contraction, or the panels will draw away from the mullions and stiles, leaving an unseemly aperture in the door.

It has been customary heretofore to cut a deep groove in the edges of the stiles, mullions, and rails in which the edges of the panels were inserted, as shown by the dotted lines in Fig. 1, in which the outer lines, d , represent the bottom of the groove, and the inner lines, b , the external edges of the panels and mullions, the ends of the mullions being cut down to form tongues of the same thickness as the panels. A vacant space was thus provided between the edges of the panels and the bottoms of the grooves in the stiles and mullions, only to be occupied when the panels and

mullions expanded sufficiently to fill it. The defects in such a form of construction are that when the panels and mullions are subjected to heat or contracted to their limit they move and slide about easily within the grooves, which at the same time and for the same cause become larger or wider, and if they all slide in one direction, as they are quite likely to in transportation, the panels will be so far displaced as to form an opening through the door between a panel and stile or mullion, and if the panels are raised, like the middle panel in Figs. 1 and 2, the slightest movement from the center would mar the appearance of the door.

A great amount of care and time is required in their manufacture to adjust the panels and mullions in their proper positions, as a slight variation would increase the exposed surface of one panel at the expense of another. By introducing within the grooves a fillet or some yielding substance to extend from the bottom of the grooves in the stiles and mullions and rails, when desired, out through the space heretofore left vacant to the edges of the panels, I am able to entirely overcome the difficulties above enumerated.

I prefer to leave a narrow fillet of wood, *a*, in the bottom of the groove, as shown in Fig. 3, and in Fig. 1, where a portion of the stile is broken away, exposing it to view. It can be thus made by the same tool that makes the groove and at the same time. With these fillets projecting out from the bottoms of all the grooves just far enough to come in contact with the inserted edges of panels and mullions they serve as stops therefor, and the doors can be put together much more easily and quickly, as no adjustment of the panels and mullions is required.

As the parts are put together in a dry and contracted condition, the first change to which they are subjected after construction is likely to be that of expansion.

As the panels and mullions expand the effect is simply to compress and flatten the fillets, which may be made very thin to yield readily to pressure.

As the parts do not expand without absorbing moisture in proportion to their degree of expansion, the fillets, by reason of their moist condition, yield more readily, and on becoming dry again return to their former positions as the edges of the panels recede from them. The parts may thus be repeatedly subjected to expansion and contraction without disturb-

ing the adjustment and position of the parts or the connection of the rails with the stiles to permit the door to "sag."

The parts are also prevented from rattling, if the edges of the panels happen to be thinner than the grooves. A material saving of material is also effected, as the panels can be made narrower without danger of their slipping to one side to form an aperture through the door. Instead of forming the fillet in the bottom of the groove, it may be a thin tongue projecting from the edge of the panel, as shown by dotted lines in Fig. 4.

The fillet may be a thin strip inserted in the wood at the bottom of the groove, as shown at Fig. 5, which may be of wood, rubber, or any other yielding material.

Instead of a strip there may be employed pegs, tacks, or nails, as shown in Fig. 7, or springs of various forms, as shown in Figs. 8, 9, and 10, *a''* being a coil-spring, and *a'''* being a thin sheet-metal spring.

In projecting the fillet *a* from the bottom of groove *d*, I do not wish to limit its location to the center of the groove, as it may be on one side of the center, or even integral with a side wall of the groove, terminating in a shoulder, *g*, Fig. 4, at a height proper to form the required stop.

The pegs, tacks, or nails may be inserted in the edges of the panels, as well as in the bottoms of the grooves, and when the stops are made of metal or other rigid material the yielding to the pressure of expansion in the parts is divided between the part in which the stop is fixed or inserted and the part which comes in contact with the exposed portion of the stop.

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

1. In a paneled door or shutter, a yielding stop between the edge of a panel and the bottom of a panel-inclosing groove in a stile, rail, or mullion, substantially as and for the purposes set forth.

2. In a paneled door or shutter, a projecting fillet or tongue of wood in the bottom of a panel-inclosing groove in a stile, rail, or mullion integral with said stile, rail, or mullion, substantially as described, and for the purposes set forth.

In testimony whereof I have hereunto set my hand this 16th day of December, 1884.

EMERSON BELDEN.

Witnesses:

GEO. A. MOSHER,

W. H. HOLLISTER, Jr.