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PATENTED APR. 5, 1904.

H. ROMÜNDER.
FLEXIBLE SLIDING PANEL OR FRONT FOR ARTICLES OF FURNITURE
OR OTHER PURPOSES.

NO MODEL.

APPLICATION FILED JAN. 12, 1904.

3 SHEETS—SHEET 1.

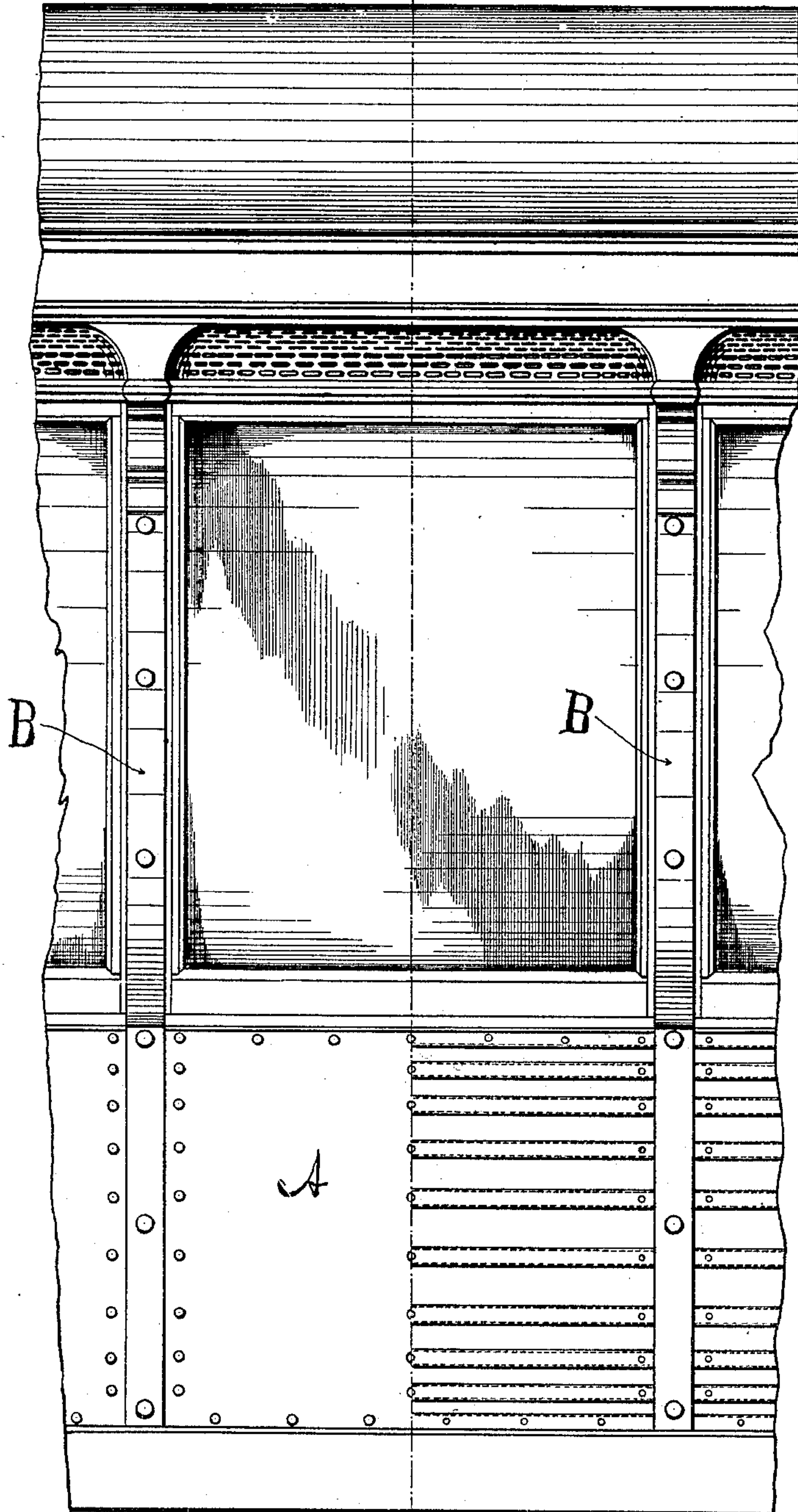


Fig. 1

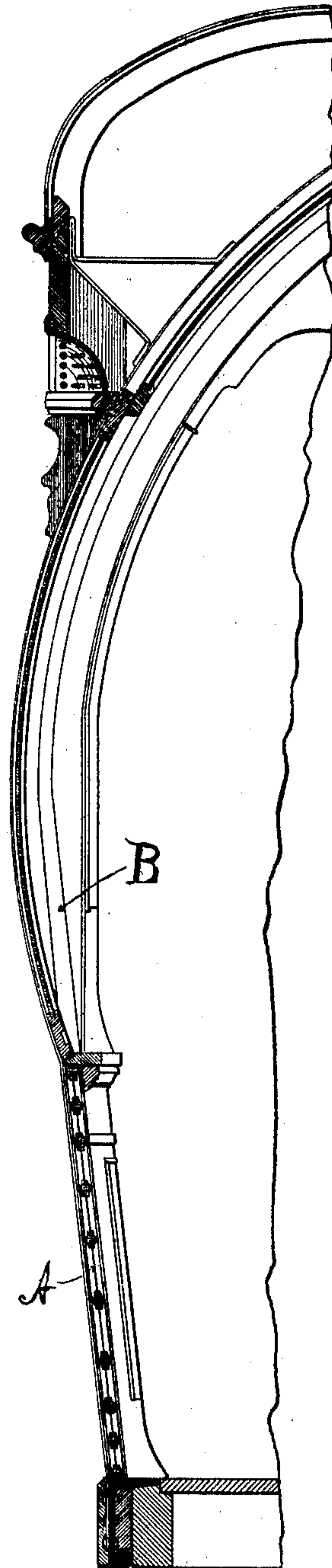


Fig. 2.

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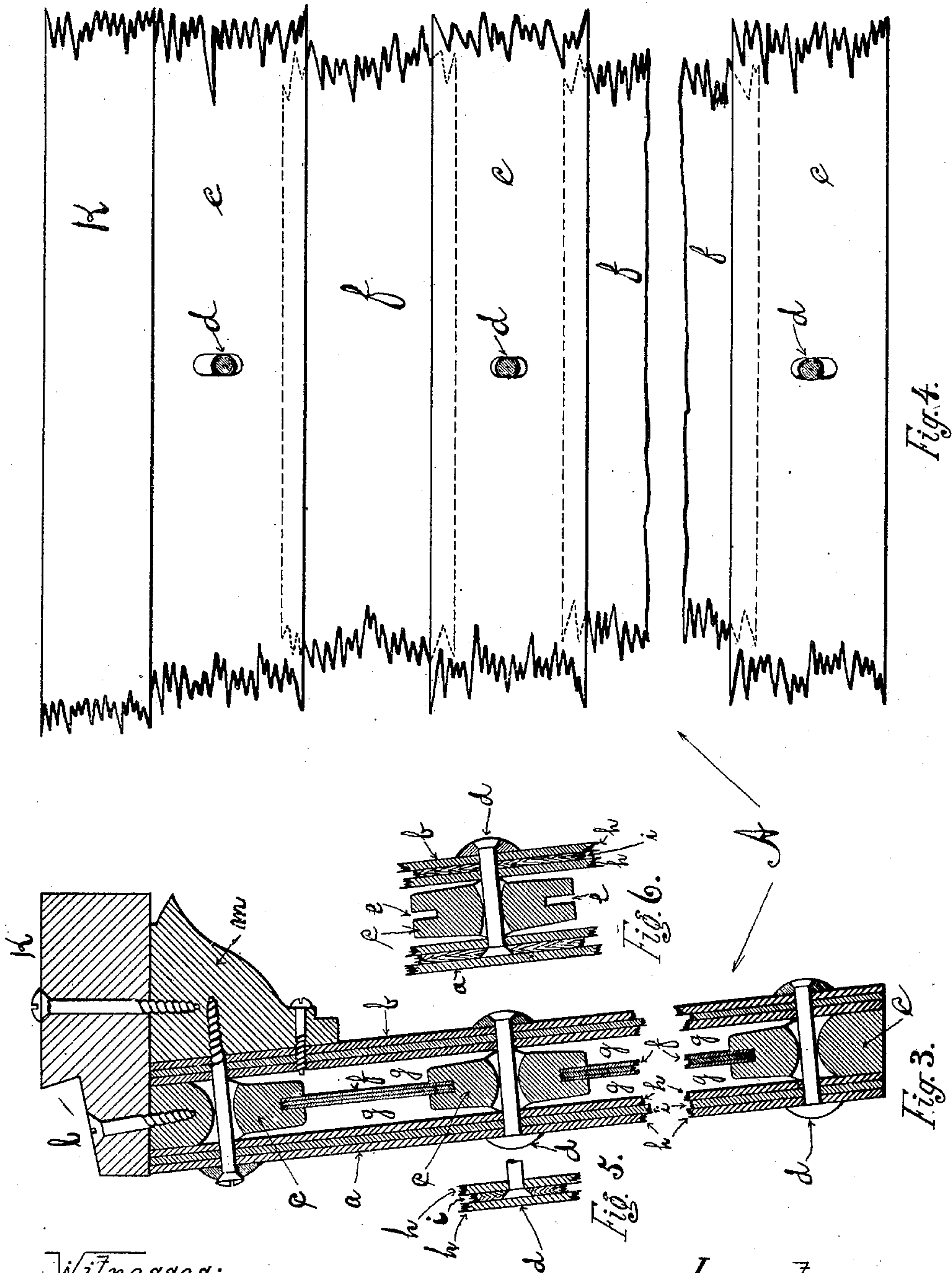
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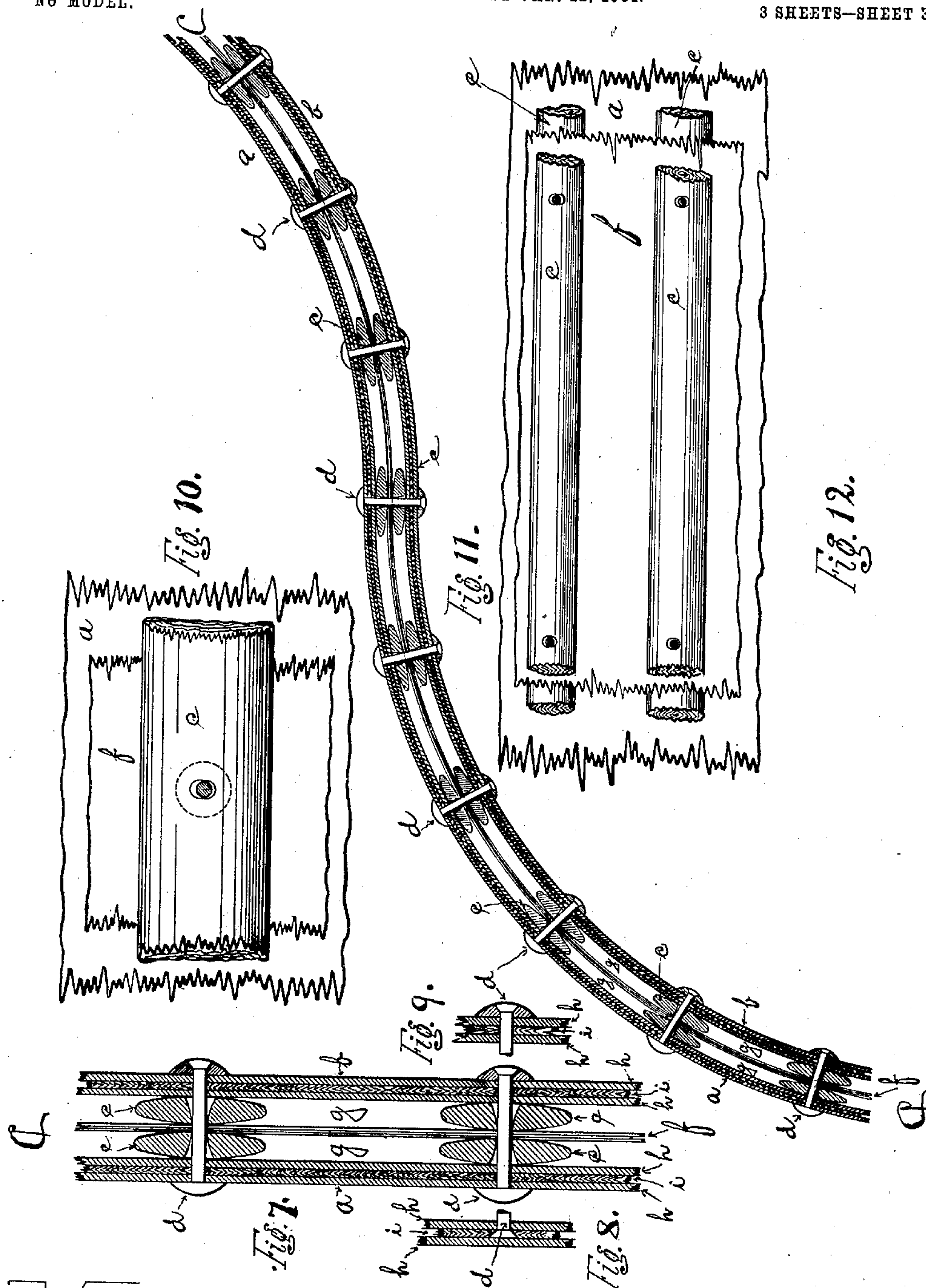
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UNITED STATES PATENT OFFICE.

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FLEXIBLE SLIDING PANEL OR FRONT FOR ARTICLES OF FURNITURE OR OTHER PURPOSES.

SPECIFICATION forming part of Letters Patent No. 756,288, dated April 5, 1904.

Application filed January 12, 1904. Serial No. 188,745. (No model.)

To all whom it may concern:

Be it known that I, HERMANN ROMÜNDER, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee, State of Wisconsin, have invented certain new and useful Improvements in Flexible Sliding Panels or Fronts for Articles of Furniture or other Purposes, of which the following is a specification.

My invention relates to that class of sliding panels and fronts that are flexible in one direction, (longitudinally,) but stiff in the transverse direction, (laterally,) and at the same time of great strength and durability, of light weight and impervious to atmospheric influences, and is designed more particularly to provide a flexible side panel for passenger-cars with movable side sections, commonly known as "convertible" cars, sliding in grooves provided in the side posts of said vehicles, and a flexible panel or front for articles of furniture, such as writing-desks, commonly known as "roll-top" desks, book and stationery cases with roll or revolving front, and similar purposes, the flexible front sliding in grooves provided for same.

The objects of my invention are to provide such panels of strong and durable character, impervious to moisture and atmospheric influences, air and dust proof, having a number of air-spaces between the outer walls, and combining lightness of weight and simplicity of construction at low manufacturing cost with greatest strength and durability, as well as great flexibility in the directions in which the panels or fronts are to slide parallel to the grooves, the panel or front thus adapting itself to the varying conformation of the grooves while sliding therein and stiffness in the transverse direction rectangular to the grooves. To accomplish these objects, I construct the panel or front principally of wood-veneer plates, each plate consisting of a number of layers of wood veneer of required thickness, the grain of alternate layers being reversed and all the layers glued together with a waterproof cementing composition under heat and pressure, whereby they form practically one homogeneous plate of wood impervious to moisture and atmospheric influences, much stronger and more

durable than a considerably thicker board with the grain all running in one direction, each wood-veneer plate for this purpose consisting, preferably, of three-ply veneer, the grain of one of the layers, preferably the center one, running almost or entirely rectangular or crosswise to that of the other two layers, whereby the wood-veneer plate is flexible and will readily bend in the direction of the grain of the minority number of layers, but stiff and of great resistance in the direction of the grain of the majority number of veneer layers contained in the wood-veneer plate.

In the accompanying drawings, which form part of this specification, my invention is fully illustrated.

Figure 1 is an elevation of a complete side section of a convertible vehicle with a flexible sliding side panel in its lowered position when the vehicle is closed. Fig. 2 shows a vertical section of the said side section on the plane indicated by the dotted line 1 1 of Fig. 1. Fig. 3 shows a sectional view, on an enlarged scale, of part of a flexible sliding side panel for a convertible vehicle with window-sill at its upper end and illustrating one way of constructing and connecting the several component parts of the panel. Fig. 4 represents part of a flexible sliding side panel for a convertible vehicle with one outer wall removed, showing the slats or strips *c c* and the middle or center plates *f f*. Figs. 5 and 6 show the rivet or bolt *d* set in a two-ply veneer outer wall and covered by the top layer *h* to produce a smooth outer surface of wood-veneer plate *a*. Fig. 7 shows a sectional view of part of a flexible sliding panel or front for an article of furniture or other purposes with an arrangement of the component parts slightly different from that shown in Fig. 3. Figs. 8 and 9 show the rivet or bolt *d* set in a two-ply veneer outer wall and covered by the top layer *h* to produce a smooth outer surface of wood-veneer plate *a*. Fig. 10 represents part of a flexible sliding front with one outer wall removed, showing the other outer wall *a*, the center plate *f*, and part of one strip or slat *c*. Fig. 11 shows a sectional view of part of a flexible sliding panel or front in curved shape bent in the direction of the

grain of the minority number of wood-veneer layers composing the wood-veneer plates of the flexible panel or front. Fig. 12 shows part of a flexible sliding front with one outer wall removed, showing part of the outer wall *a*, the center wall *f*, and part of two strips or laths *c c* on either side of the center wall.

Same letters indicate similar parts in the different drawings.

10 A (shown in Figs. 1, 2, 3, and 4) is a flexible sliding side panel of a convertible vehicle movable in grooves provided in the side posts B B. C (shown in Figs. 7 to 12) is a flexible sliding panel or front for an article of furniture—as, for instance, the cover of a roll-top writing-desk or the front of a roll or revolving-front book or stationery case or for other purposes. These flexible sliding panels or fronts are so constructed as to be impervious to moisture and atmospheric influences, as well as air and dust-proof, have air-spaces between the outer-walls, and to combine great strength and durability, lightness of weight, and simplicity of construction, at low manufacturing cost, with the requisite lateral stiffness and longitudinal flexibility of a panel or front that has to accommodate itself to the variations in the curvature of the grooves in which it slides. This construction I obtain by making the panel or front of two wood-veneer plates *a* and *b*, which form the outer walls of the panel or front. As shown in Fig. 3, I provide between these plates *a* and *b* at suitable intervals laterally-parallel strips or slats *c c*, which may be of metal or wood, as desired, and of suitable form, each being provided with a number of perforations, preferably reamed and tapering to the center of the slat or strip, so that the bolts or rivets *d d*, which pass through these holes and hold the two plates *a* and *b* together, will allow the panel or front to bend readily, according to the curvature of the grooves in which it slides, but are being held tightly in the center of the slats or strips and cannot slip or give.

Into grooves *e e*, provided in the strips or slats *c c* longitudinally, the plates *f f*, which may consist of one or more ply wood veneer or other suitable material, are inserted and held in position by them, whereby the air-spaces *g g* are produced between the plates *f f* and the wood-veneer plates *a* and *b*, and the panel or front becomes considerably stronger and stiffer in the direction parallel with the slats or strips *c c* without in the least affecting its flexibility in the longitudinal direction parallel with the grooves. These wood-veneer plates *a* and *b*, and preferably also the plates *f f*, consist each of two or more layers of wood veneer *h h* and *i i* of desired thickness, the alternate layers of each plate being laid with the grain reversed and all the layers united by a waterproof cementing composition, whereby they form practically one homogeneous plate of wood, each plate being

exceedingly flexible in the direction of the grain of the minority number of veneer layers *i i* and very stiff in the direction of the grain of the majority number of layers *h h*, which is almost or exactly rectangular to that of the layers *i i*.

In Figs. 7, 10, 11, and 12 the middle or center plates *f f*, which in this case may be made of one continuous or several separate plates of one or more ply wood veneer or other suitable material, are separated from the outer wall-plates *a* and *b* and held in position by means of the parallel slats or strips *c c* of suitable form and material, which slats or strips are provided transversely on both sides of the middle or center plate or plates *f* at suitable intervals, thereby greatly strengthening and stiffening the panel or front laterally and causing it to conform readily to the varying curvatures of the grooves in which it slides without in the least affecting its flexibility in the longitudinal direction, rivets or bolts *d d* passing through the outer wall-plates *a* and *b*, the slats *c c*, and the center plate or plates *f* and holding the several component parts securely together, the air-spaces *g g* being produced thereby between the plate or plates *f* and the wood-veneer plates *a* and *b*, the holes in the strips *c c* in this case being reamed on one side of the strips only to permit the panel or front to bend easily and readily and adapt itself to the varying conformation of the grooves in which it slides.

At one or both ends of the panel or front, preferably parallel with the strips or slats *c c*, suitable end rails of any desired shape or size may be suitably secured to the outer wall-plates *a* and *b* or to the plates *a*, *b*, and *f* and the end slats or strips *c c* of the panel or front. When used as a panel for convertible passenger-cars, a window-sill *l*, provided with a recess *l* and preferably a bracket *m* of suitable form and size, is secured to the upper part of the panel, the bottom rail of the window-sash resting against the window-sill and upon the said recess *l* when the window is closed, thereby affording a snug joint of the window and panel.

As illustrated in Figs. 5 and 6 and Figs. 8 and 9, the head of the rivets or bolts *d d* may be set flush in the two or more ply veneer outer wall *a* and covered by the top veneer layer *h* to produce a smooth outer surface of the outer wood-veneer wall *a*.

I claim—

1. The above-described sliding panel composed of two wood-veneer plates forming the outer walls of the panel, a number of slats or strips of suitable form and material, arranged parallel with each other transversely between the wall-plates at suitable intervals, and a center plate or plates of suitable material, held in position by the slats or strips; all suitably connected and so arranged as to form a number of air-spaces between the center plate or

plates and the outer walls of the panel, substantially as shown and described.

2. An improved flexible sliding panel or front, composed of an inner and an outer wall, each wall consisting of a number of layers of wood veneer of desired thickness, with reversed grain, glued together with a waterproof cementing composition and forming practically one homogeneous plate of wood; a center or middle wall formed by one continuous or several separate plates, consisting of one or more ply wood veneer or other suitable material; and a number of slats or strips of suitable material, provided laterally between the inner and outer wall at suitable intervals, parallel with each other; the several component parts being suitably connected by means of rivets or otherwise, so as to form a number of air-spaces between the center or middle wall and the inner and outer walls of the panel or front, substantially as shown and described.

3. An improved sliding panel or front, flexible in one direction, longitudinally, and stiff in the transverse direction, laterally, composed of a number of wood-veneer plates, each consisting of two or more ply wood veneer, the grain of alternate layers being reversed and all the layers glued together with a waterproof cementing composition under heat and pressure whereby they form practically one homogeneous plate of wood, impervious to moisture and atmospheric influences; each plate being flexible in the direction of the grain of the minority number of layers but stiff and of great resistance in the direction of the grain of the majority number of layers contained in the wood-veneer plate; and a number of slats or strips of suitable form and material; all suitably connected and so arranged as to produce a panel or front with air-spaces between its outer walls, adapted to slide in grooves provided in the articles for which it is intended, and owing to its flexibility in the longitudinal direction, parallel with the grooves, accommodating itself to the variations in the curvature of the said grooves, substantially as shown and described.

4. An improved flexible panel or front composed of two wood-veneer plates forming the outer walls of the panel or front, each plate consisting of two or more ply wood veneer, the grain of the alternate layers being reversed and all the layers united by a waterproof cementing composition; one continuous plate or a number of separate plates forming the middle or center wall of the panel or front and consisting of one or more ply wood veneer or other suitable material; and a number of slats or strips of suitable material, placed parallel with each other at suitable intervals, between the outer walls of the panel or front, holding the center or middle wall in position, and extending lengthwise in the direction of the grain of the majority number of layers contained in the wood-veneer plates; the several

component parts being suitably held together to form a panel or front with air-spaces between its outer walls and exceedingly flexible longitudinally, in the direction in which the panel or front is to slide, parallel to the grooves supporting it, and stiff in the transverse direction, rectangular to the grooves; substantially as shown and described.

5. An improved flexible panel for passenger-cars with movable side sections, composed of two wood-veneer plates forming the inner and outer walls of the panel, a number of slats or strips, of suitable material and form, provided transversely between the said wood-veneer plates at suitable intervals, and one or more plates of suitable material provided between the said slats or strips and held in position by them between the said inner and outer walls, forming a middle or center panel-wall and producing a number of air-spaces within the said panel; the several component parts being suitably connected to form a movable panel, flexible longitudinally and stiff laterally, substantially as shown and described.

6. An improved flexible sliding panel for movable side sections in convertible passenger-cars, composed of a number of wood-veneer plates each of which consists of two or more layers of wood veneer, the alternate layers being preferably laid with the grain reversed, and all the layers secured together by a waterproof cementing composition, whereby they form practically one homogeneous plate of wood, impervious to moisture and atmospheric influences; these wood-veneer plates forming the outer and the middle or center walls of the panel; a number of slats or strips, of metal or wood, arranged parallel with each other at suitable intervals, transversely between the wood-veneer plates, separating the center or middle wall from the outer walls of the panel and forming a number of air-spaces within the said panel; all suitably connected and held together; and a window-sill provided with a recess, secured to the upper portion of the panel, the bottom rail of the window-sash resting against the window-sill and upon the said recess, when the window is closed, thereby affording a snug joint of the window and panel; substantially as shown and described.

7. An improved flexible sliding panel or front, composed of two wood-veneer plates forming the outer walls of the panel or front, each wood-veneer plate consisting of two or more ply wood veneer, the grain of the alternate layers being reversed and all the layers united by a waterproof cementing composition whereby they form practically one homogeneous plate of wood, impervious to moisture and atmospheric influences, exceedingly flexible in the direction of the grain of the minority number of layers and stiff in the direction of the grain of the majority number of layers; and a middle or center wall formed by one continuous or a number of separate

plates, of one or more ply wood veneer or other suitable material, separated from the outer wall-plates and held in position by means of a number of parallel slats or strips 5 of suitable material, provided transversely between the middle or center wall and the outer walls of the panel, at suitable intervals, producing a number of air-spaces within the said panel and greatly strengthening and 10 stiffening the panel or front laterally and causing it to conform readily to the varying conformation of the grooves in which it slides, without in the least affecting its flexibility in the longitudinal direction; each of the said 15 strips or slats being provided with a number of perforations, reamed on one or both sides of the slats or strips; substantially as and for the purposes stated.

8. An improved flexible sliding panel or 20 front, composed of two outer wall-plates, consisting each of two or more ply wood veneer, one or more center or middle wall-plates, of suitable material, and a number of strips or slats, arranged parallel with each other at 25 suitable intervals, laterally between the center or middle wall plate or plates and the outer wall-plates, forming a number of air-spaces between the center or middle and the outer wall-plates, the several component parts be- 30 ing suitably held together, preferably by means of bolts or rivets passing through the

wall-plates and reamed perforations of the slats or strips, and producing a sliding panel or front with the requisite lateral stiffness and longitudinal flexibility to accommodate 35 itself to the variations in the curvature of the grooves in which it slides.

9. In a flexible sliding panel or front a number of slats or strips of suitable form and material, suitably provided with a number of 40 reamed perforations each; the said slats or strips being placed parallel with each other at suitable intervals between the outer walls of the panel or front and one or more plates forming a center or middle panel-wall, so ar- 45 ranged as to form a number of air-spaces between the said panel-walls; all the component parts being suitably held together by means of rivets or bolts, to form a sliding panel or front of lateral stiffness and longitudinal 50 flexibility; the heads of the rivets or bolts being preferably set flush with the inner or middle veneer layer *i* of the outer wood-veneer panel-wall *a* and covered by the outer veneer layer *h*, to produce a smooth outer surface of 55 the wood-veneer plate *a*, substantially as shown and described.

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