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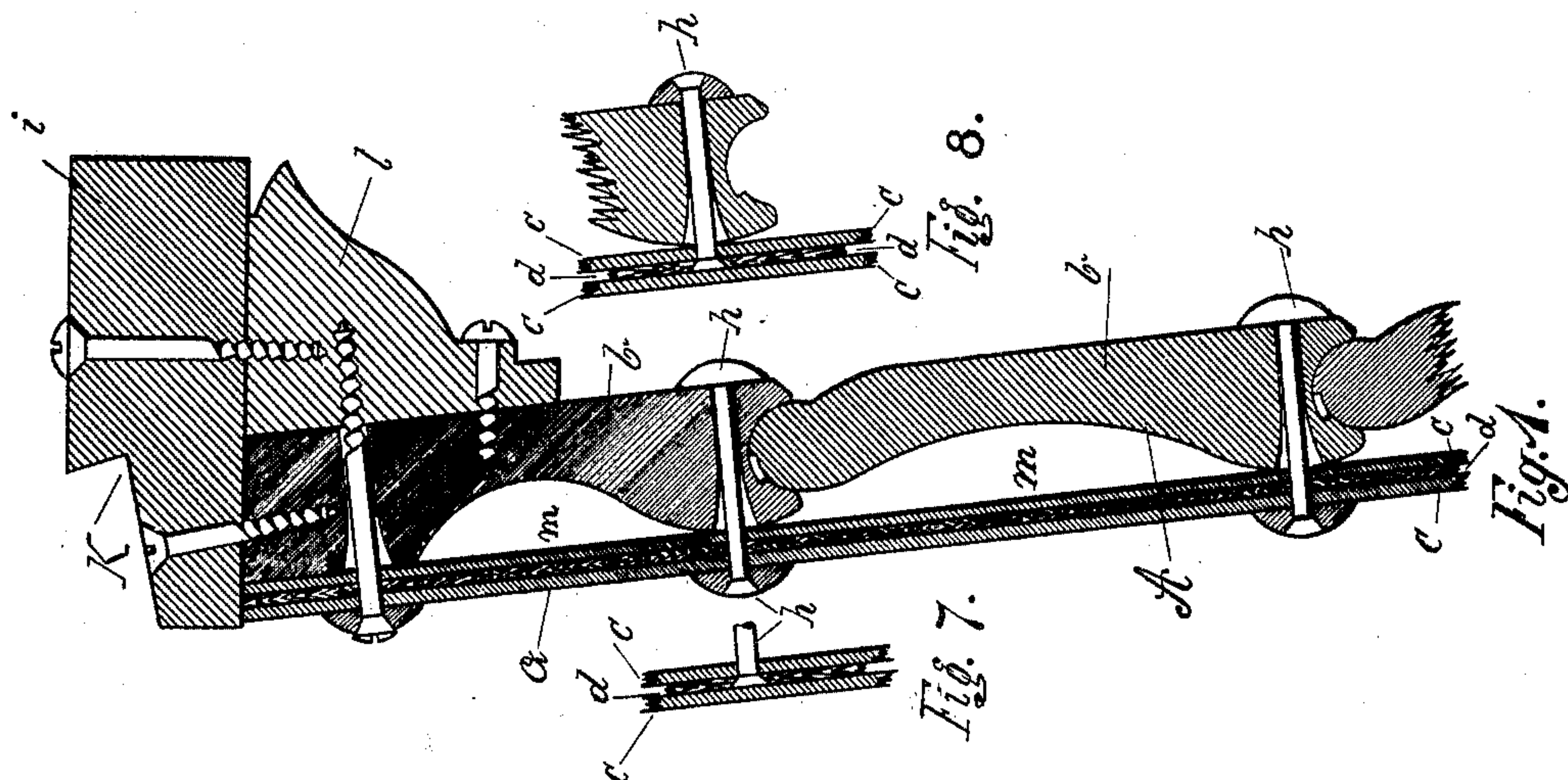
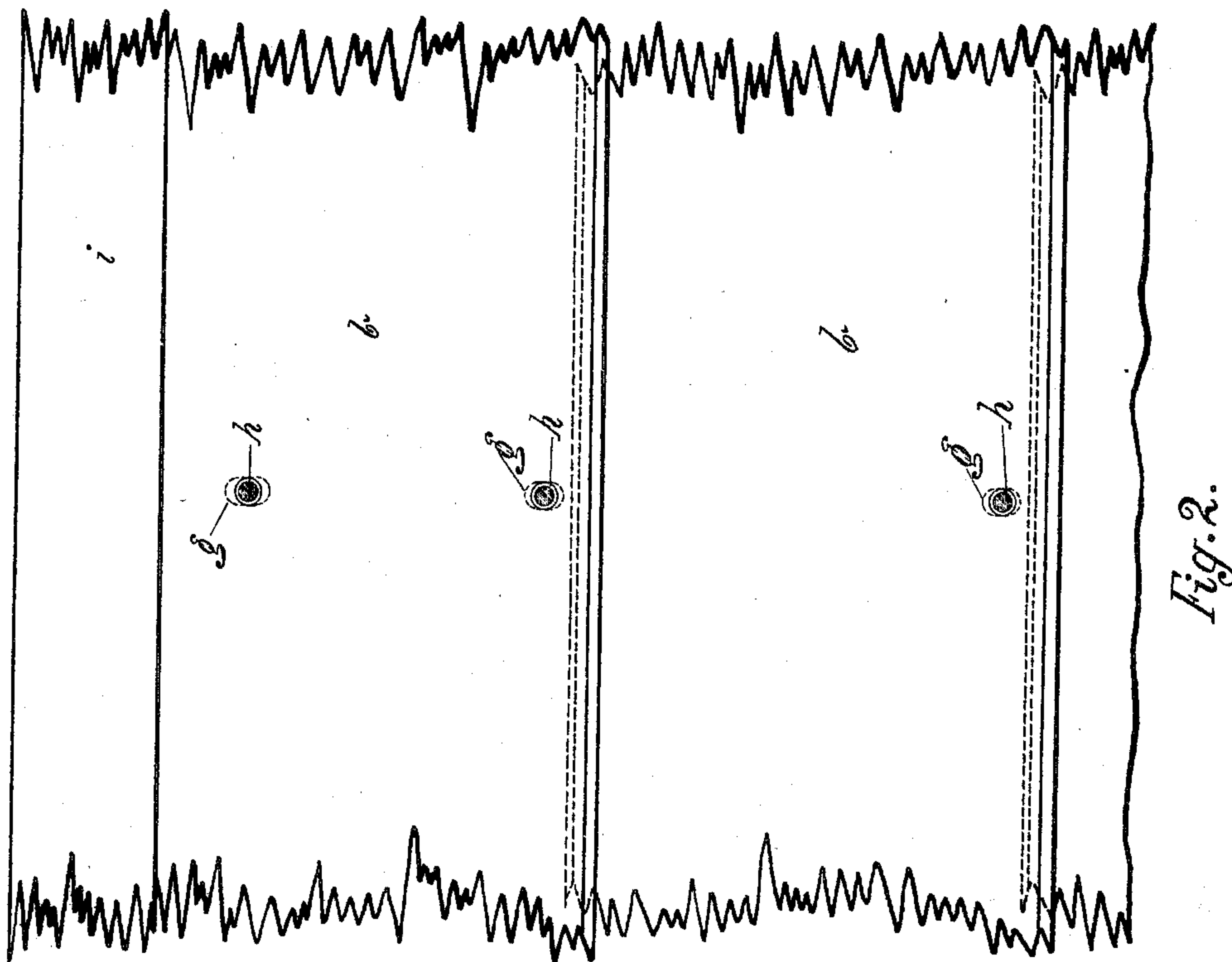
PATENTED DEC. 6, 1904.

H. ROMÜNDER.
FLEXIBLE SLIDING PANEL OR FRONT, &c.

APPLICATION FILED JAN. 23, 1904.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:
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Paula Rosemark

Inventor:
Hermann Rommender

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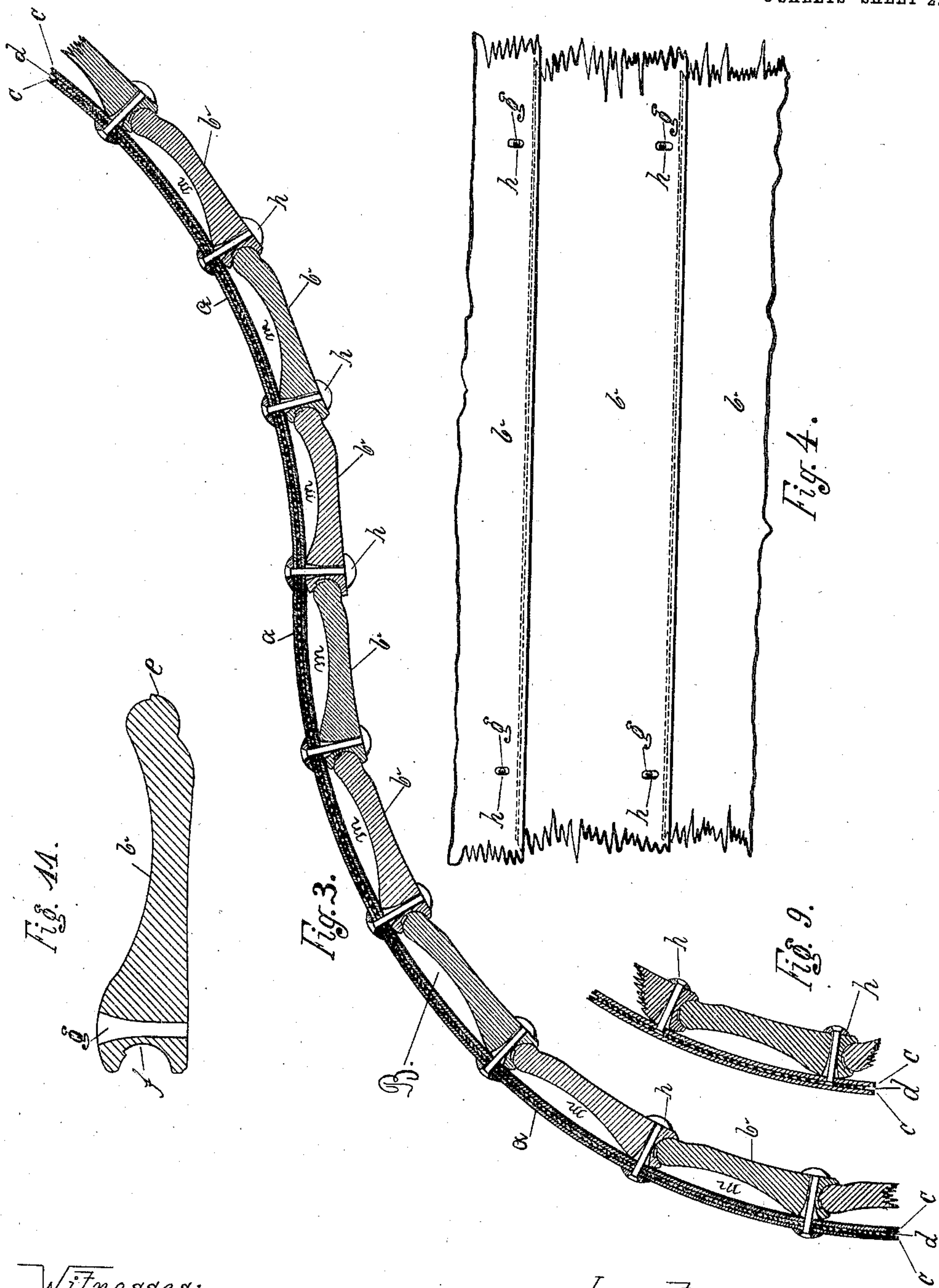
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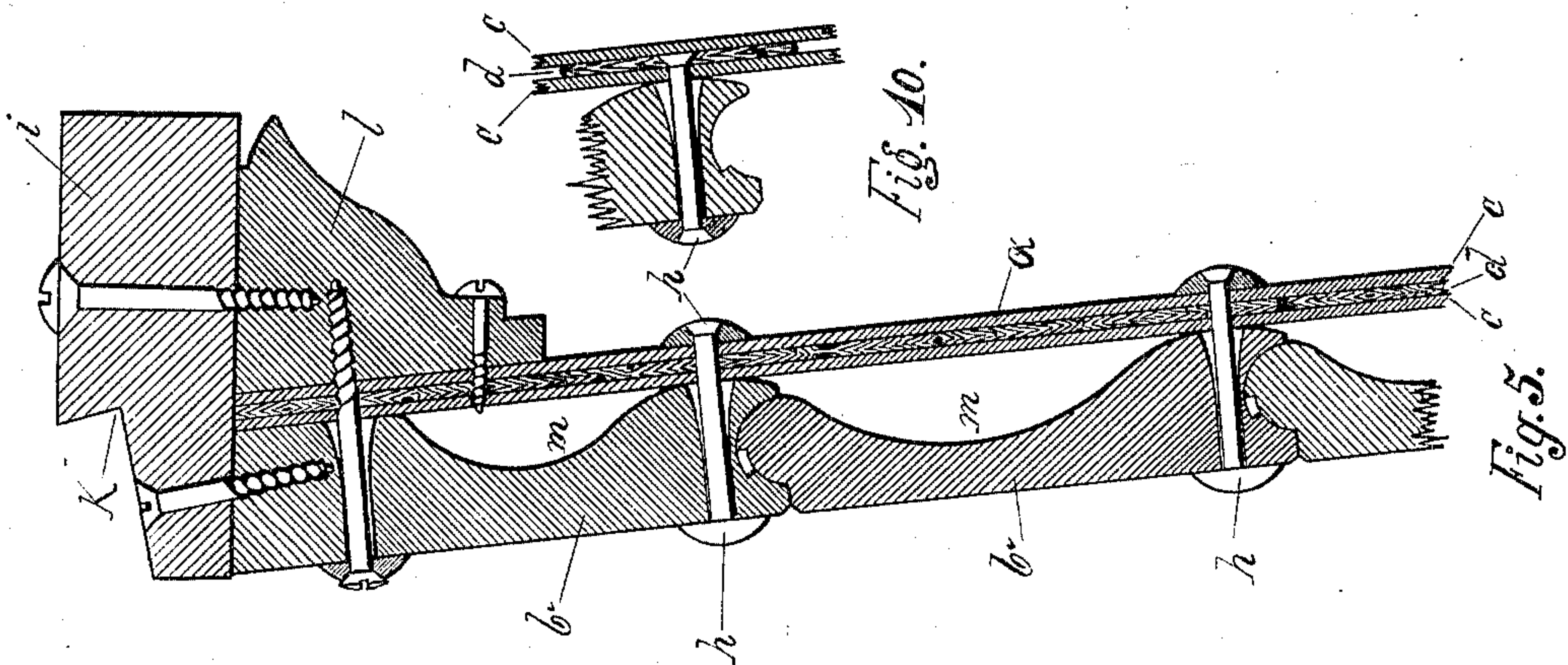
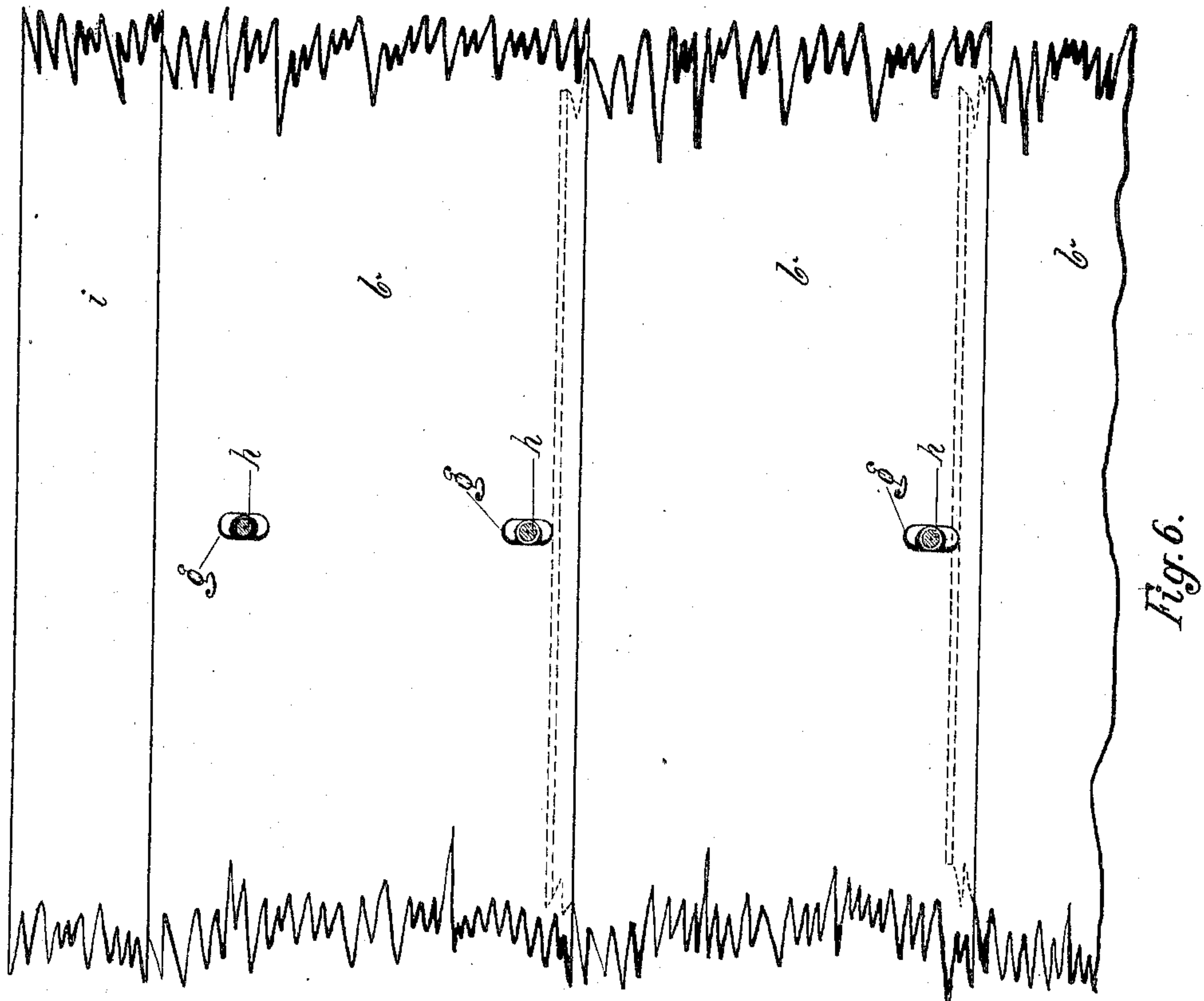
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3 SHEETS—SHEET 3



Witnesses:
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UNITED STATES PATENT OFFICE.

HERMANN ROMÜNDER, OF MILWAUKEE, WISCONSIN.

FLEXIBLE SLIDING PANEL OR FRONT, &c.

SPECIFICATION forming part of Letters Patent No. 776,551, dated December 6, 1904.

Application filed January 23, 1904. Serial No. 190,324. (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 and 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 it 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 top, 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, consisting of only a very few parts, having a number of air-spaces between the outer walls, and combining lightness of weight and simplicity of construction at exceedingly 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 with the grooves, the panel or front thus adapting itself to the varying conformation of the grooves while sliding therein, and great stiffness in the transverse direction, rectangular to the grooves. To accomplish these objects, I construct the panel or front of a wood-veneer plate, forming one outer wall, and a number of knuckle or ball jointed slats or strips of suitable form and shape made of wood or metal or other suitable material and so arranged as to interlock one with the other and together form the other outer wall of the panel or front, the said slats or strips being

suitably connected to the wood-veneer plate, a number of air-spaces being produced between both walls, each wood-veneer 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. Any number of layers may be used in the construction of these wood-veneer plates; but in practice I prefer to employ three-ply wood-veneer plates, and throughout the following specification and drawings I shall use and refer to this number, the layers being so arranged that the grain of one of the layers, preferably the center one, runs almost or entirely rectangular or crosswise to that of the other two layers, preferably the outer ones, whereby the wood-veneer plate becomes 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.

With these objects in view I construct a flexible sliding panel or front, such as is described in this specification and shown in the accompanying drawings, in which—

Figure 1 shows a vertical transverse section of part of a flexible sliding side panel for a convertible vehicle with a window-sill at its upper end. Fig. 2 represents part of the flexible sliding panel for a convertible vehicle illustrated in Fig. 1 with the heads of the rivets or bolts *h h* and the bracket *l* removed, showing the ball or knuckle jointed slats or strips *b b*, the rivets or bolts in section, and the reamed perforations *g g* of the slats or strips. Fig. 3, Sheet 2, shows a sectional view of part of a flexible sliding front or panel for an article of furniture or other purposes in curved shape bent in the directions of the grain of the minority number of wood-veneer layers composing the wood-ve-

neer plate *a*. Fig. 4 shows part of a flexible sliding panel or front with the heads of the rivets or bolts *h h* removed, showing the knuckle or ball jointed slats or strips *b b*, the rivets in section, and the reamed perforations *g g* of the slats or strips. Fig. 5, Sheet 3, shows a vertical transverse section of part of a flexible sliding side panel for convertible vehicles with window-sill at its upper end, the position of the outer walls being reversed, the slats or strips being at the outside and the wood-veneer plate on the inside of the panel. Fig. 6 represents part of the flexible sliding panel illustrated in Fig. 5 with the heads of the rivets or bolts *h h*, the bracket *l*, and the wood-veneer plate *a* removed, showing the knuckle-jointed slats or strips *b b*, with their reamed perforations *g g*. Figs. 7 and 8, Sheet 1, Fig. 9, Sheet 2, and Fig. 10, Sheet 3, show part of a flexible sliding panel or front in section, the bolt or rivet *h* being set in a two-ply wood-veneer wall, covered by the outer or top layer *c* to produce a smooth outer surface of the wood-veneer plate *a*. Fig. 11, Sheet 2, shows a transverse section of one of the slats or strips *b* on a large scale.

Same letters indicate similar parts in the different drawings.

A (shown in Figs. 1, 2, 5, and 6) is a flexible sliding side panel of a convertible vehicle, movable in grooves provided in the side posts of the car-body. B (shown in Figs. 3 and 4) is a flexible sliding front for an article of furniture—as, for instance, the cover or top 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 A B 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, consist of a very few component parts only, and 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 a wood-veneer plate *a*, which forms one outer wall of the panel or front, and a number of strips or slats *b b* of suitable form and shape, which may be of wood, metal, or other suitable material and which interlock with their adjoining edges and together form the other outer wall of the panel or front.

The wood-veneer plate *a* consists of two or more ply wood veneer, preferably of three-ply veneer, of desired thickness *c c* and *d d*, the alternate layers of each plate being laid with the grain crossed or reversed, so that the grain of layers *c c* is almost or exactly rectangular to that of the layers *d d* and all the layers united by a waterproof cementing composi-

tion, 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 *d d* and very stiff in the direction of the grain of the majority number of layers *c c*.

The separate slats or strips *b b* are preferably formed, as shown in Fig. 11, Sheet 2, concave on one side and almost or entirely straight on the other side, the meeting edges of adjoining strips or slats being made convex and rounded with a slight projection or nose *e* at one edge of each slat or strip and concave with a slight recess *f* at the other edge, the convex edge of one slat or strip with its nose or projection *e* closely fitting into and interlocking with the concave edge with its recess *f* of the adjoining slat producing a knuckle or ball joint.

Each slat or strip *b* is provided with a number of holes or perforations *g g*, reamed at one side, preferably the concave side, (the one facing the wood-veneer plate,) so that the bolts or rivets *h h*, which pass through these holes and hold the walls of the panel together, will allow the panel or front to bend readily and adapt itself to the varying conformation of the grooves in which it slides, the slats or strips *b b* extending lengthwise in the direction of the grain of the majority number of layers contained in the wood-veneer plate *a* and being so arranged as to make the wood-veneer plate *a* considerably stronger and stiffer laterally without in the least affecting its flexibility in the longitudinal direction parallel with the grooves, and the panel or front composed of the said wood-veneer plate *a* and a number of the said slats or strips *b b*, which form a number of air-spaces *m m* on the inside of said panel or front, is stiff and of great resistance laterally, but of sufficient flexibility longitudinally to accommodate itself to the varying conformation of the grooves while sliding therein.

At one or both ends of the panel or front suitable end or top and bottom rails of any desired shape or size and material may be suitably secured to the wood-veneer plate *a*, interlocking with the adjoining intermediate slat or slats *b b*.

When used as a panel for movable side sections in convertible passenger-cars, a window-sill *i*, provided with a recess *k* and preferably a bracket *l* of suitable form and size, may be 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 *k* when the window is closed, thereby affording a snug joint of the window and panel.

As illustrated in Figs. 7, 8, 9, and 10, the head of the rivets or bolts *h h* may be set flush in the two or more ply wood-veneer portion of wall *a* and covered by the outer or top veneer layer *c* to produce a smooth outer surface of the wood-veneer wall *a*.

It being understood that the principle of my invention is the construction of a flexible sliding panel or front for articles of furniture and other purposes, composed of an inner and an outer wall, one wall being formed by a wood-veneer plate consisting of a number of layers of wood veneer of suitable 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, and the other wall being formed by a number of separate slats or strips of suitable material with or without a top and bottom or end rails, their convex and concave edges with a recess and corresponding projection fitting snugly together and interlocking one with the other, each slat or strip being provided with a number of perforations reamed on one side, both walls being suitably held together by means of rivets or bolts or otherwise and so arranged as to produce a number of air-spaces *mm* between the said walls by means of the concave side of the slats or strips *bb*, facing the wood-veneer wall-plate *a*, and to form a panel or front of the requisite lateral stiffness and longitudinal flexibility to accommodate itself to the curvature of the grooves in which it slides.

I claim—

1. The above-described flexible sliding panel or front, composed of a wood-veneer plate, forming one wall, and a number of slats or straps, of suitable material, forming the other wall of the panel or front, both walls being suitably held together by means of rivets or bolts, and forming a panel or front with a number of air-spaces between its walls, and of the requisite lateral stiffness and longitudinal flexibility to adapt itself to the variations in the curvature of the grooves in which it slides.

2. An improved flexible sliding panel or front, composed of an inner and an outer wall, one wall being formed by a wood-veneer plate, consisting of three-ply wood veneer, of desired thickness, glued together with reversed grain by means of a waterproof cementing composition, and forming practically one homogeneous plate of wood; the other wall consisting of a number of separate interlocking strips or slats, of metal, wood or other suitable material, each slat or strip being provided with a number of reamed perforations, and suitably connected with the wood-veneer plate by means of rivets or bolts, the heads of the bolts or rivets being set flush with the inner or middle veneer layer *d* of the wood-veneer panel-wall and covered by the outer veneer layer *c*, to produce a smooth outer surface of the wood-veneer plate.

3. An improved sliding panel or front, flexible in one direction, longitudinally, and stiff in the transverse direction, laterally, composed of a wood-veneer plate, 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 material, the meeting edges of adjoining strips or slats being convex with a slight projection at one edge of each slat or strip and concave with a slight recess at the other edge, the convex edge of one slat or strip closely fitting into and interlocking with the concave edge of the adjoining slat or strip, each slat or strip being provided with a number of reamed perforations, the slats or strips being suitably connected to the wood-veneer plate, the concave side of the strips or slats facing the wood-veneer plate, and so arranged as to produce a panel or front with a number of air-spaces between its 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 varying conformation of the said grooves, substantially as shown and described.

4. An improved flexible sliding panel or front, composed of a wood-veneer plate, forming one wall of the panel or front, and 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; and a number of knuckle-jointed slats or strips, of wood, metal or other suitable material, extending lengthwise in the direction of the grain of the majority number of veneer layers contained in the wood-veneer wall-plate, and forming the other panel-wall; the slats or strips and the wood-veneer plate being suitably held together by means of rivets or bolts, the concave side of the slats or strips facing the wood-veneer plate; both walls forming a panel or front with air-spaces between its walls, and exceedingly flexible longitudinally, in the direction in which the panel or front is to slide, parallel with the grooves supporting it, and stiff in the transverse direction, rectangular to the grooves, substantially as shown and described.

5. An improved flexible sliding panel for passenger-cars with movable side sections, composed of a suitable top and bottom rail and a number of intermediate slats or strips, of suitable material and form, provided with a number of reamed perforations; interlocking with their adjoining edges and forming a knuckle or ball jointed flexible panel-wall; and a wood-veneer plate, consisting of a number

of layers of wood veneer, the grain of alternate layers being reversed and all the layers united by a waterproof cementing composition, forming the other flexible wall of the panel; the slats or strips being arranged lengthwise in the direction of the grain of the majority number of veneer layers contained in the wood-veneer wall-plate, and suitably connected thereto by means of rivets or bolts passing through the reamed perforations of the slats or strips and through the wood-veneer plate, the heads of the rivets or bolts being preferably set flush with the inner veneer layers, the outer veneer layer covering the heads and producing a smooth surface of the wood-veneer wall-plate.

6. An improved flexible panel for passenger-cars with movable side sections, composed of a number of slats or strips, of suitable material, provided with a number of perforations, reamed on one side, preferably the concave side of the slats or strips, each slat or strip having one convex and one concave edge, the convex portion of one slat or strip securely fitting into the concave portion of the adjoining slat or strip and interlocking by means of the projection and corresponding recess provided at the edges of the slats or strips; and a wood-veneer plate, consisting of two or more veneer layers glued together with reversed grain by means of a waterproof cementing composition, and forming practically one homogeneous plate of wood, flexible in the direction of the minority number of layers and stiff in the direction of the majority number of veneer layers; all suitably connected and held together to form a sliding panel, flexible longitudinally and stiff laterally, with a number of air-spaces between its walls; a suitable bottom rail being secured to the lower end of the panel, 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, substantially as shown and described.

7. An improved flexible sliding panel or front, composed of a number of separate knuckle or ball jointed slats or strips, of suitable material, interlocking with their adjoining edges, the convex edge of one strip or slat and the concave edge of the adjoining slat or strip securely fitting into one another with their projection and corresponding recess, and provided with a number of reamed perforations, suitably connected to a wood-veneer plate, consisting of two or more ply wood veneer arranged with the grain of alternate layers reversed, and glued together with a waterproof cementing composition under heat and pressure; and a suitable top, bottom or end rail being connected at one or both ends of the panel or front to the wood-veneer plate, interlocking with the adjoining intermediate slat or slats, substantially as shown and described.

8. An improved flexible sliding panel or front, composed of a number of separate knuckle or ball jointed slats or strips, of suitable material, interlocking with their adjoining edges, the convex edge of one strip or slat and the concave edge of the adjoining slat or strip securely fitting into one another with their projection and corresponding recess, and provided with a number of perforations, reamed on the concave side of the strips or slats; and a wood-veneer plate, consisting of two or more ply wood veneer, arranged with the grain of alternate layers reversed, and glued together with a waterproof cementing composition under heat and pressure; the slats or strips being suitably connected with the wood-veneer plate, the concave side of the slats or strips facing the wood-veneer plate and producing a number of air-spaces within the said panel or front, substantially as shown and described.

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