W. L. CONWELL.

SECTIONAL CAST METAL DOOR WITH INTERCHANGEABLE PARTS.

APPLICATION FILED DEC. 4, 1914.

1,270,013.

Patented June 18, 1918.

2 SHEETS—SHEET 1.

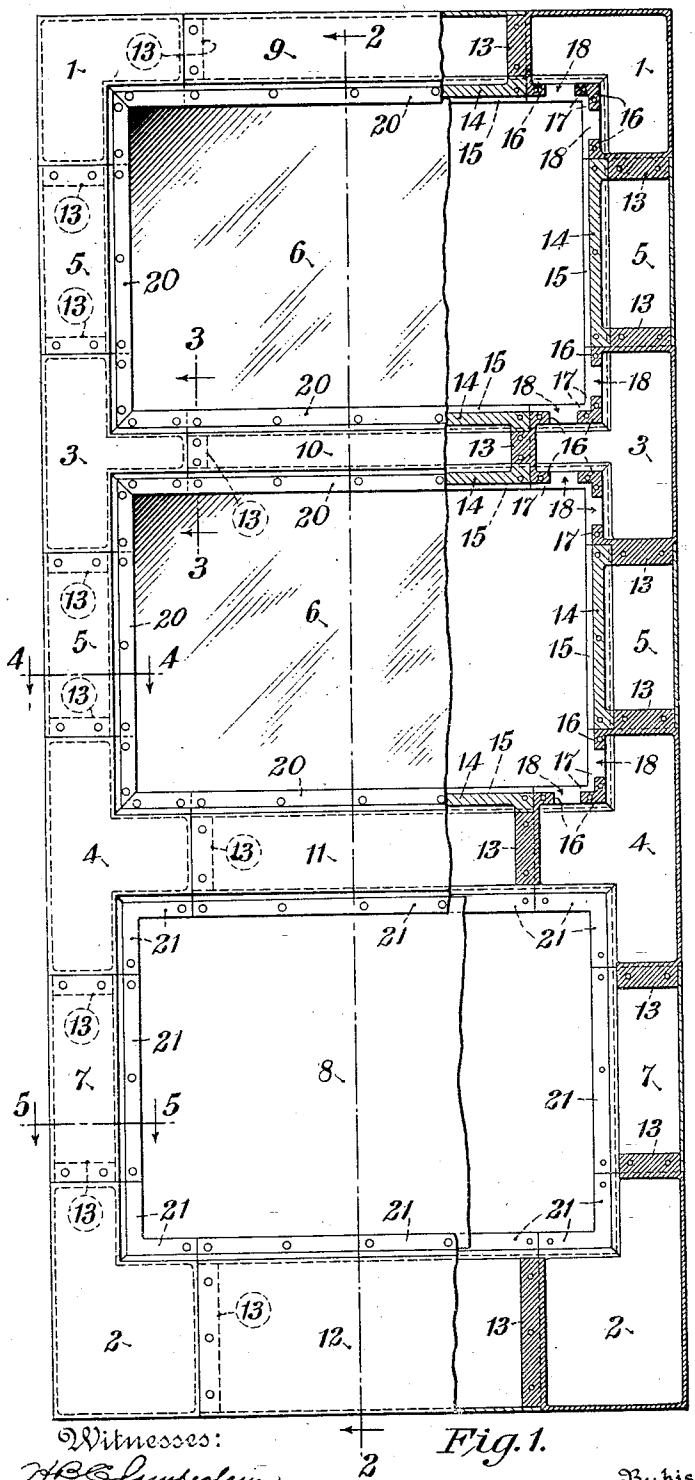

Fig. 1.

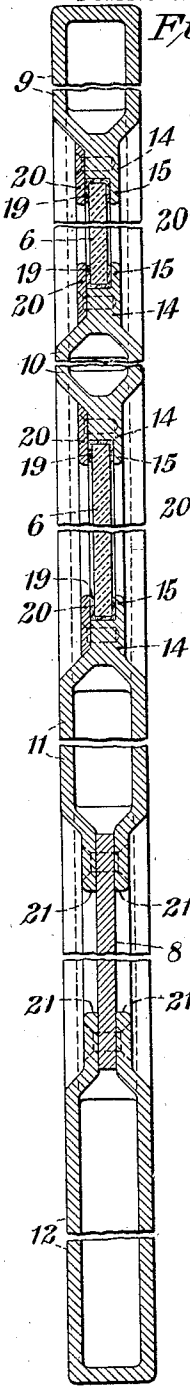

Fig. 2.

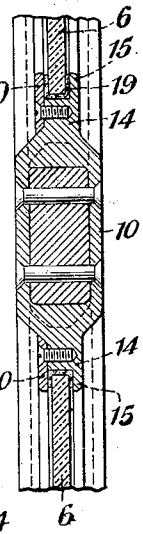

Fig. 3.

Witnesses:

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By his Attorney

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2 SHEETS—SHEET 2.

Fig. 4.

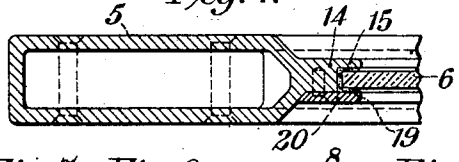


Fig. 5.

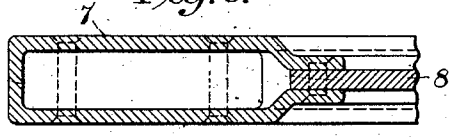


Fig. 7.

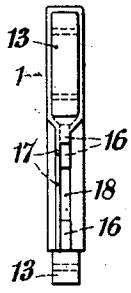


Fig. 8.

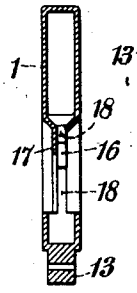


Fig. 6.

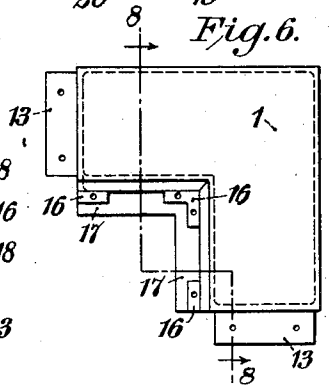


Fig. 10.

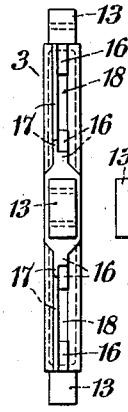


Fig. 9.

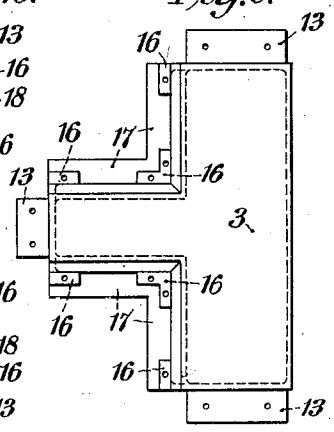


Fig. 16.

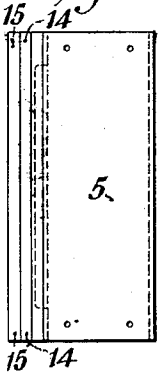


Fig. 14.

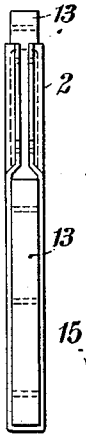


Fig. 13.

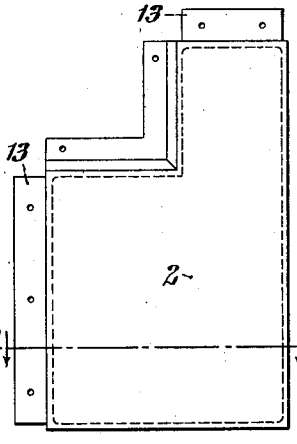


Fig. 12.

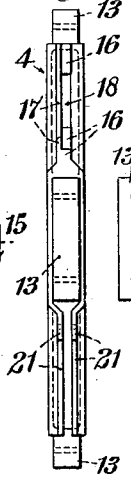


Fig. 11.

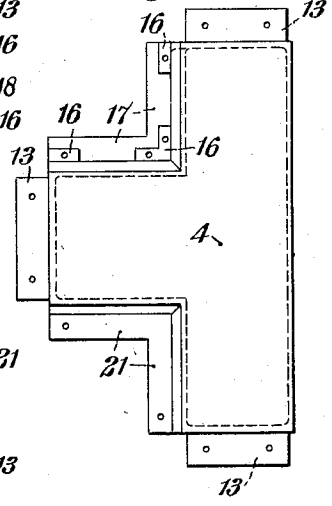


Fig. 17.

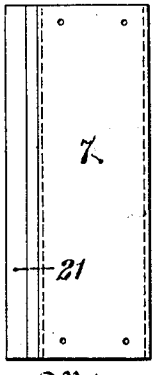
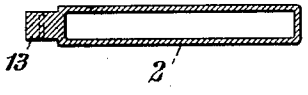


Fig. 15.



Witnesses:

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UNITED STATES PATENT OFFICE.

WALTER L. CONWELL, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO ELLCON COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SECTIONAL CAST-METAL DOOR WITH INTERCHANGEABLE PARTS.

1,270,013. Specification of Letters Patent. Patented June 18, 1918.

Application filed December 4, 1914. Serial No. 875,484.

To all whom it may concern:

Be it known that I, WALTER L. CONWELL, residing at Montclair, New Jersey, and being a citizen of the United States, have invented certain new and useful Improvements in Sectional Cast-Metal Doors with Interchangeable Parts, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and to use the same, reference being had to the accompanying drawings, which illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof will occur to persons skilled in the art.

In said drawings:

Figure 1 is mainly a side elevation of the door, but is considerably broken away to show a vertical central section thereof.

Fig. 2 is a transverse vertical section taken on line 2—2, of Fig. 1, intermediate portions being broken out.

Fig. 3 is a similar section through a joint in the upper intermediate rail, and is taken on line 3—3 of Fig. 1.

Fig. 4 is a horizontal section through one of the stile sections adjacent one of the removable panels, and is taken on line 4—4 of Fig. 1.

Fig. 5 is similar view through a stile section adjacent the lower fixed panel, and is taken on line 5—5 of Fig. 1.

Figs. 6, 7 and 8 are detail views of one of the upper corner pieces, Fig. 8 being taken on line 8—8 of Fig. 6.

Figs. 9 and 10 are detail views of one of the upper intermediate connection members.

Figs. 11 and 12 are like views of one of the lower intermediate connection members.

Figs. 13. 14 and 15 are detail views of one of the lower corner pieces, Fig. 15 being taken on line 15—15 of Fig. 13.

Fig. 16 is a side elevation of one of the upper intermediate connecting stile sections; and

Fig. 17 is a similar view of one of the lower connecting stile sections.

Wooden stock doors are an established commercial commodity of highly appreciated value, and it is a purpose of my present invention to produce a metallic door which may not only be kept in stock in recognized standards, but which may, to meet sudden and unusual demands, be quickly but well constructed in desired sizes and forms by the mere assemblage of stock parts.

It is also an object to construct the parts of a light and non-corrosive material, whereby the door possesses inherent qualities, suiting it to be exposed to the elements, and, when of massive dimensions to present an imposing appearance, or for other purposes, permitting it to be easily moved.

Another advantage is its knock-down characteristics, allowing it to be shipped in the most advantageous manner.

The panel design and the number of panels may be optional, it requiring only the selection of correctly dimensioned and formed parts and the arrangement thereof.

Other advantages becoming manifest hereinafter are manifestly a part of this invention and are to be so construed.

In the drawings, which illustrate a door with cast metal parts, 1 represents the upper corner pieces of the door and 2 the lower corner pieces, the former each having top rail and stile portions, and each lower corner piece being provided with bottom rail and stile portions.

Upper intermediate connection members 3 each have stile and intermediate rail portions, as do the lower intermediate connection members 4.

Complementary stile sections 5 are employed in connection with removable panels 6 and are present between upper corner pieces 1 and upper intermediate connection members 3, and also between the latter and lower intermediate connection members 4.

Other complementary stile sections 7 are used in conjunction with permanent panels 8 and are shown as connecting lower intermediate connection members 4 with lower corner pieces 2.

Joining the upper corner pieces 1, is a top rail section 9 suited to the removable panel 6, and between the removable panels 6 is located a double intermediate panel-admitting section 10, uniting upper intermediate connection members 3.

Between the lower removable panel 6 and permanent panel 8 is a combination panel-admitting and panel-embracing section 11, coupling lower intermediate connection members 4, and appropriately affiliated with

both the removable and permanent panels, 6 and 8, respectively.

Connecting the lower corner-pieces 2 is a bottom rail section 12 formed for association with the stationary panel 8.

Corner-pieces 1 and 2, intermediate connection members 3 and 4, complementary stile sections 5 and 7, top rail section 9, duplex rail section 10, combination rail section 11 and bottom rail section 12, are all cast metal members, and are preferably hollow, as shown, to insure the door against excessive weight. Where, however, unusually heavy doors are desired, as for vault entrances, and the like, these parts may be solid, and their transverse sectional dimensions may be reduced or increased to determine the strength of the door.

Further lightness is given the door by forming it of metal having a low specific gravity, and it will possess inherent protective qualities against the elements if said material is also non-corrosive. To acquire these properties, I prefer to use an aluminum alloy, one commercially known as aero metal, being excellently adapted to the purpose. Other alloys or metals may be used, however, in constructing the door, and, when the latter is to have exceptional strength for protective purposes, cast steel is more suitable.

Stile sections 5 and 7, and rail sections 9, 10, 11 and 12 are illustrated as being hollow prismoids, the opposite ends of each being shaped to form a mortise. Distinguishing details of the various sections will be described hereinafter.

Each of the corner-pieces 1 and 2 and the intermediate connection members 3 and 4 is provided at its opposite ends with tenons 13, adapted to fit within the mortises of the stile and rail sections associated with it. Said tenons 13 and the mortise portions of the stile and rail sections 5, 7, 9, 10, 11 and 12 contain perforations or drilled holes for rivets or screws which lock the parts together. In some instances, however, the joints may be welded instead of riveted. It is to be noted that said joints also serve to brace the door frame.

Those edge portions of the corner pieces, stile and rail sections and the intermediate connection members, which coöperate to surround panels, are preferably beveled or given the contour of a classic molding, improving the appearance of the door, and the beveling or molding contour may be on either or both sides of the door.

Upper corner-pieces 1, top rail section 9, upper stile sections 5, upper intermediate connection members 3 and intermediate duplex rail section 10 surround the upper removable panel 6, while said upper intermediate connection members 3, intermediate duplex rail section 10, other intermediate stile sections 5, lower intermediate connection members 4 and intermediate combination rail section 11, inclose the lower removable panel 6.

The sides of the specified stile and rail sections which are contiguous to the removable panels are each provided with an inwardly directed ridge 14, shouldered to produce a panel-retaining flange 15.

Corner-pieces 1, upper intermediate connection members 3 and the upper portions of lower connection members 4 are provided with pads or bosses 16 and flanges 17, which, taken together, are of the same cross section as the combined ridges and flanges 14 and 15, and are alined therewith. Between pads or bosses 16 of said upper corner-pieces and intermediate connection members are core openings 18, communicating with the interior of these parts.

Alined ridges 14 and pads or bosses 16, and also their respective alined flanges 15 and 17, form panel-receiving depressions for the removable panels 6, and the cushioning strips 19 therefor. After the panels 6 are inserted into their depressions, they are held in place by retaining strips or frames 20, secured to the ridges 14 and pads or bosses 16 by screws or other suitable means.

The contiguous sides of stile and rail sections, intermediate connection members and corner-pieces which surround a permanent panel, in the present instance the lower side of the intermediate combination rail section 11, stile sections 7, bottom rail section 12 and the portions of lower intermediate connection members 4 and lower corner-pieces 2, which connect said stile and rail sections, are each provided with spaced parallel flanges 21 adapted to lap and embrace the borders of a permanent panel 8. Rivets or other devices pass through flanges 21 and the incased borders of permanent panel 8, securing said panel in place. Instead of being riveted, the flanges, obviously, may be welded to the panel borders.

It is to be understood that the door shown in the drawings is but one embodiment of my invention, and that the various door elements may be arranged to produce different types of doors. The stiles and rail sections are interchangeable with similar sections of different lengths, and doors with a considerable number of permanent panels of relatively small height may be constructed.

Duplex panel 10 and upper intermediate connection members 3 may be omitted and, when stile sections 5 of suitable length are substituted a large single glass or other removable panel may be present in the door.

Replacing each rail section 9, 10, 11 and 12, or some of them, with pairs of short similar sections, and connecting the latter with

vertically disposed intermediate connection members similar to members 3 or 4, will result in a door having mullions. In fact, a wide range of different combinations is possible. Also, the various sections may be perforated or left open in various locations for the insertion of door fixtures, such as locks, door hangers and other accessories.

What I claim is:

1. A sectional door comprising corner-pieces and intermediate connection members having angularly disposed legs forming panel-opening corners, and complementary sections of less length than the distance between the panel-opening corners toward which they extend, said sections being interposed between the ends of opposing legs and having the same outside cross sectional dimensions and outline as those legs, thereby forming stiles and rails of uniform cross section longer than the individual stile-and-rail-forming parts.

2. A sectional door comprising corner-pieces and intermediate connection members having augularly disposed legs, complementary sections connecting alined legs and having the same outside cross sectional dimensions as those legs, and integral means on some of the parts secured to other parts in a manner preserving uniformity of cross section in said sections and the legs contiguous thereto.

3. In a sectional door, corner-pieces and intermediate connection members having angularly disposed legs and being spaced from each other, and complementary sections, of the same thickness as the divergent legs of said corner-pieces and intermediate connection members, and mortise and tenon joints between the outer ends of said legs and the ends of said complementary sections.

4. In a sectional door, principally tubular corner-pieces and intermediate connection members having diverging legs, and substantially tubular complementary sections interlocked with said legs, said sections and the legs contiguous thereto having cross sectional perimeters of sufficiently exact correspondence in proportions to cause the tubular portions of said corner-pieces, intermediate connection members and complementary sections to be in end to end abutment and held from telescoping.

5. In a sectional door, a door frame comprising corner-pieces and intermediate connection members having angular tubular portions forming diverging legs, said legs being reduced beyond the extremities of their tubular portions to form shoulders and tenons, and tubular complementary sections held by said shoulders from telescoping with the tubular portions of said legs and being entered by said tenons.

6. In a sectional door, a door frame comprising corner-pieces and intermediate connection members and complementary sections connecting the same, the foregoing frame parts having tubular portions which in adjoining parts have cross sectional perimeters of sufficiently exact correspondence in proportions to maintain the tubular portions of adjoining parts in end to end abutment and from telescoping, means locking the parts together, panel receiving portions on same parts and position-retaining means therefor.

7. In a sectional door, a door frame comprising corner-pieces, intermediate connection members and complementary sections connecting and interlocking with said corner-pieces and connection members, said frame parts each being a single-piece element having a tubular portion, all adjoining tubular portions having cross sectional perimeters of sufficiently exact correspondence in proportions to prevent their telescoping, integral portions of said parts forming differently constructed panel-receiving frames, a removable panel in one of said frames, removable retaining means therefor, and a panel irremovably held in a differently constructed receiving-frame.

8. In a sectional cast door, a door frame having stiles and rails and panel openings outlined thereby, said frame comprising corner-pieces and intermediate connection members spaced from each other and complementary sections connecting said corner-pieces and connection members, the inner panel opening-outlining sides of said corner-pieces, connection members and connecting sections forming molding contour portions and in one or more panel openings a further inwardly disposed panel-receiving frame comprising integral portions of the opening-outlining parts, and in one or more other panel openings a further inwardly disposed panel-embracing frame comprising integral portions of the opening-outlining parts, a removable panel or panels in the receiving frame or frames, removable retaining means therefor, and a permanent panel or panels fixedly secured in said embracing frame or frames.

9. In a sectional cast door, corner-pieces and intermediate connection members spaced from each other, complementary sections connecting said corner-pieces and intermediate connection members, said parts interlocking one with another to form stiles and rails greater in length than the individual parts each of which is of uniform cross section throughout its length, a removable panel received by some of the parts, retaining means therefor, and a permanent panel fixed to some of the parts, all the parts except the removable panel being of corrosion-resisting metal of low specific gravity.

10. In a sectional cast door, a door frame comprising substantially tubular corner-

pieces and substantially tubular stiles and rails, said stiles and rails having on their panel opening-forming sides molding-contour portions and panel frame-forming portions, and said corner-pieces having on their panel opening-forming sides complementary molding-contour portions and panel frame-forming pads or bosses, there being core holes between the latter communicating with the interior of the corner-pieces, a removable panel received by the frame-forming portions, retaining members therefor, and means securing the latter to said frame-forming portions.

11. In a sectional door, a door frame comprising substantially tubular corner-pieces and substantially tubular stiles and rails forming a panel-opening, said stiles and rails having on their panel opening-forming sides molding-contour portions and spaced portions of a panel-embracing frame, the space between said portions communicating with the interior of said members and said corner-pieces having on their panel opening-forming sides complementary molding-contour portions and spaced portions of the panel-embracing frame, the space between said latter portions communicating with the interior, a permanent panel embraced by said frame portions, and means fastening said panel thereto.

12. In a sectional door, a door frame having panel openings and comprising interlocking corner-pieces, stile sections, top, bottom and intermediate rail sections and intermediate connection members, all being substantially tubular and having panel-outlining sides with molding-contour portions thereon, some being provided with frame-forming portions of a receiving-frame including corner-pieces having openings communicating with their interiors, and other corner-pieces, stile and rail sections and connection members being provided with spaced frame-forming portions of a binding frame, the space between said latter portions communicating with the interior of the binding frame-forming parts, some connection members and a rail section being common to both frames, a removable panel and a permanent panel positioned, respectively, in said receiving and binding frames, retaining means for said removable panel, and securing means for said permanent panel.

13. In a sectional door, a door frame comprising spaced corner-pieces and intermediate connection members and stile sections, top, bottom and intermediate rail sections connecting and interlocking with said corner-pieces and connection members, all being substantially tubular and having panel-outlining sides with frame-forming portions arranged to form a plurality of panel-openings and similar panel-receiving frames on said outlining sides, the frame-forming portions of said corner-pieces and intermediate connecting members being provided with pads or bosses, there being openings interposed therebetween leading to the interiors, said intermediate rail section or sections being common to a pair of receiving frames, removable panels within the frames and retaining means therefor.

14. In a sectional door, a door frame comprising spaced corner-pieces and intermediate connection members and stile sections, top, bottom and intermediate rail sections connecting and interlocking with said corner-pieces and connection members, all being substantially tubular and having panel-outlining sides with binding frame-forming portions on said panel-outlining sides arranged to form a plurality of panel openings and similar panel-binding frames, the frame-forming portions of the parts which outline the panel openings having spaced portions, the space between said latter portions communicating to the interiors of said parts, and permanent panels secured within said binding frames, said intermediate rail section or sections being common to a pair of binding frames.

15. In a sectional cast door, a door frame comprising spaced corner-pieces and intermediate connection members and stile sections, top, bottom and intermediate rail sections connecting and interlocking with said corner-pieces and connection members, all being substantially tubular and having panel-outlining sides, some with portions forming panel-receiving frames and others with portions forming a panel-binding frame in panel openings, some of the parts being common to similar frames and other parts to dissimilar frames, the receiving frame-forming portions of some of said corner-pieces and of the connection members having pads or bosses with core openings interposed therebetween, and all the binding frame-forming portions of other corner-pieces and said connection members comprising spaced parallel flanges, the space therebetween communicating with the interiors of their respective parts, removable panels and a permanent panel positioned, respectively, in said panel-receiving and panel-binding frames, and retaining means for said removable panels.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

WALTER L. CONWELL.

Witnesses:
H. B. CHAMBERLAIN,
JOSEPH C. DUNN.

Correction in Letters Patent No. 1,270,013.

It is hereby certified that in Letters Patent No. 1,270,013, granted June 18, 1918, upon the application of Walter L. Conwell, of Montclair, New Jersey, for an improvement in "Sectional Cast-Metal Doors with Interchangeable Parts," an error appears in the printed specification requiring correction as follows: Page 4, line 2, claim 10, after the word "rails" and before the comma insert the words *forming a panel-opening;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 23d day of July, A. D., 1918.

[SEAL.]

R. F. WHITEHEAD,

Acting Commissioner of Patents.

Cl. 189—53.