(No Model.) 2 Sheets—Sheet 1.

E. H. DUCHEMIN.

CURTAIN.

No. 597,402. Patented Jan. 18, 1898.

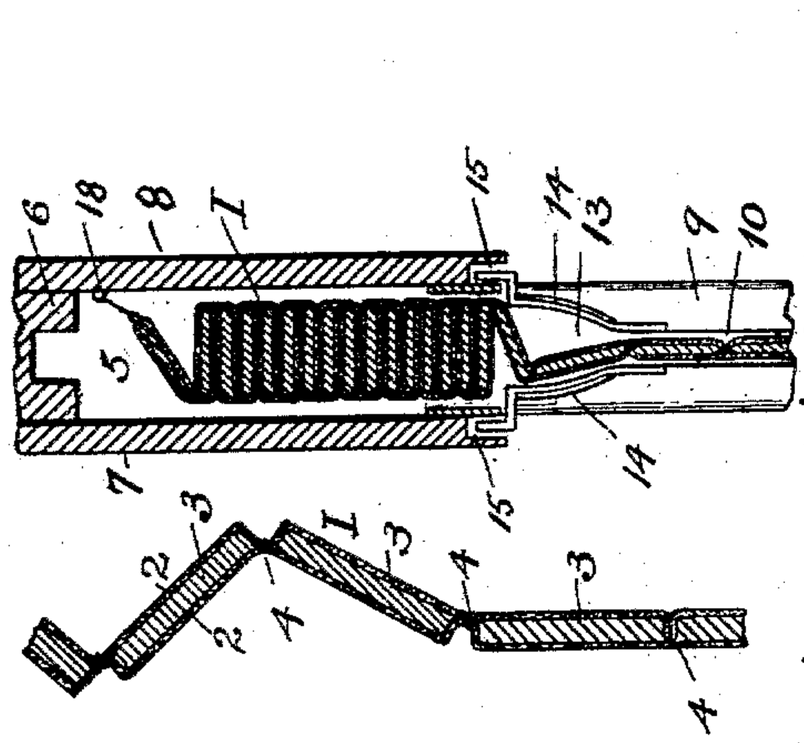

Fig. 3.

Fig. 6.

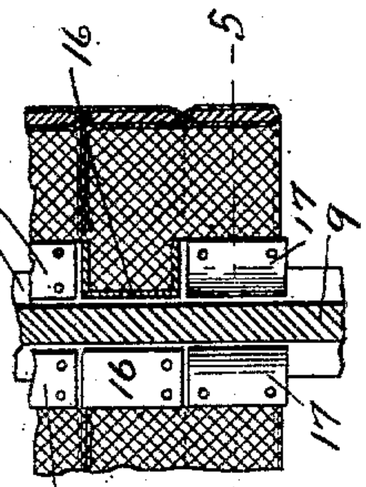

Fig. 4.

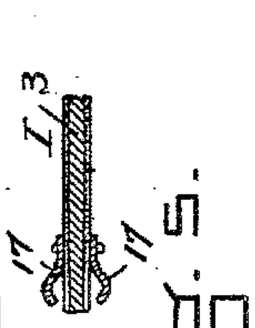

Fig. 5.

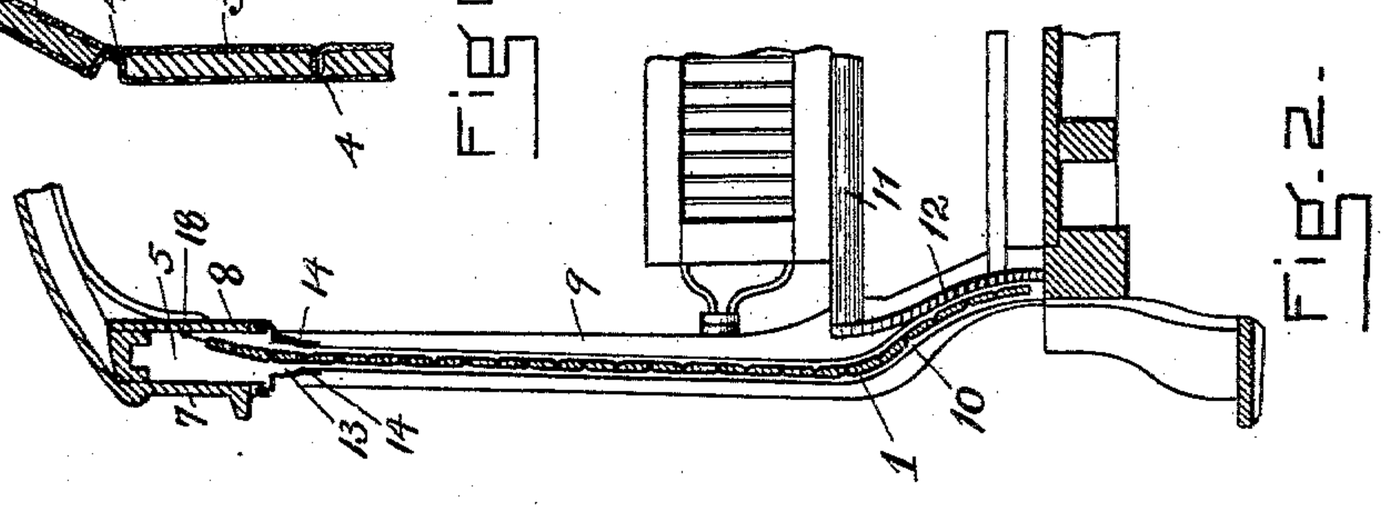

Fig. 2.

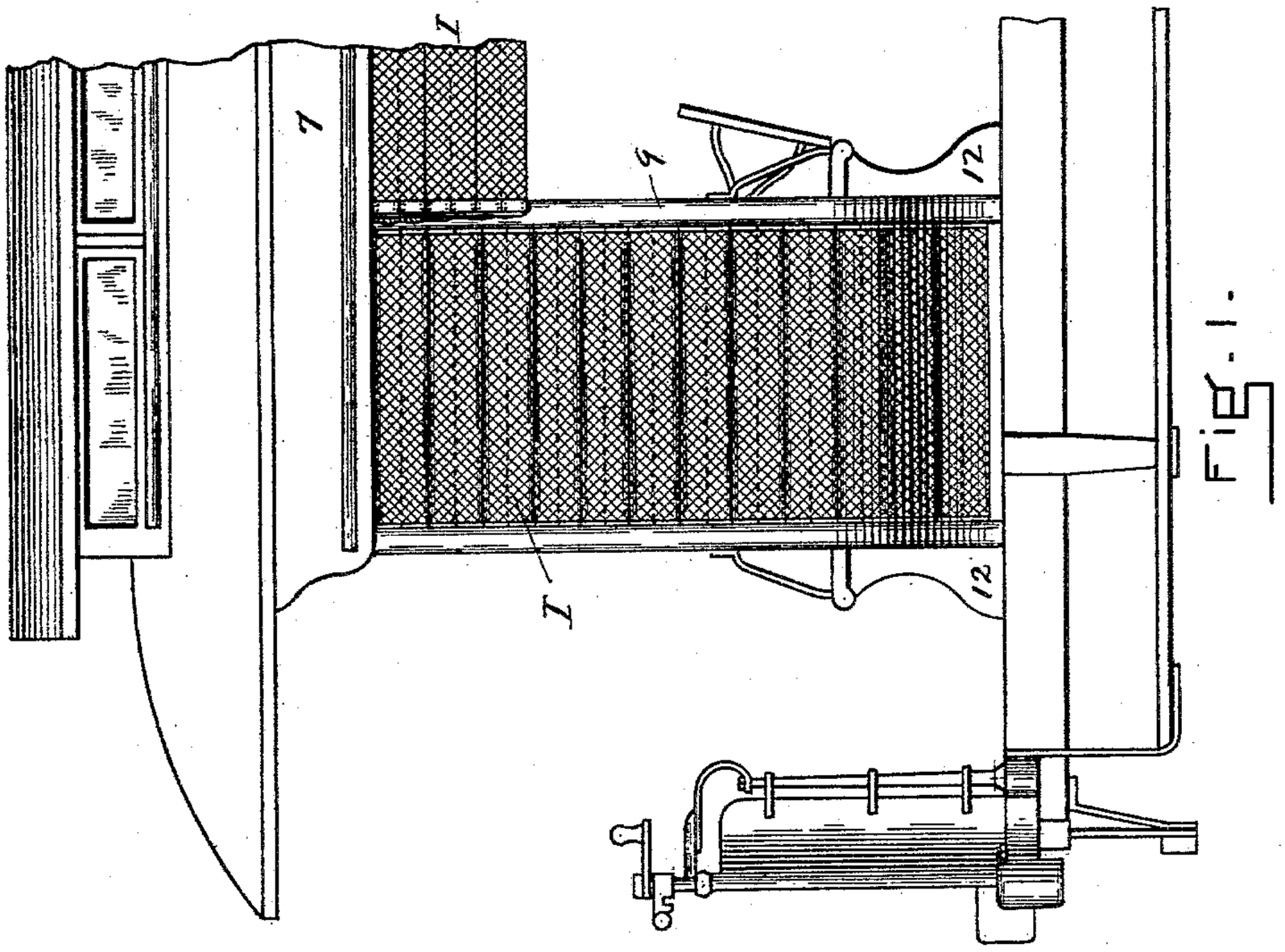

Fig. 1.

WITNESSES

J. F. McKay

Ellen Duchemin

INVENTOR

Edmund H. Duchemin

(No Model.) 2 Sheets—Sheet 2.

E. H. DUCHEMIN.

CURTAIN.

No. 597,402. Patented Jan. 18, 1898.

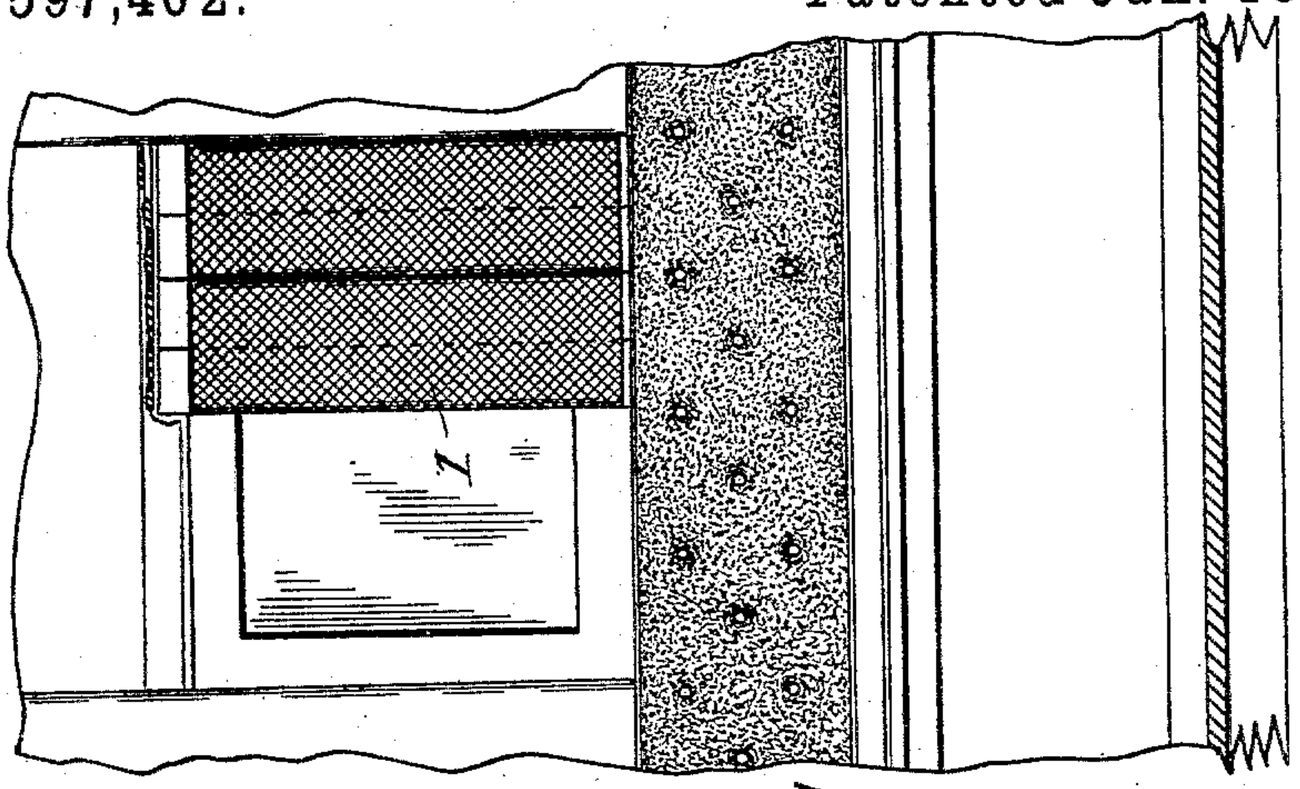

Fig. 5.

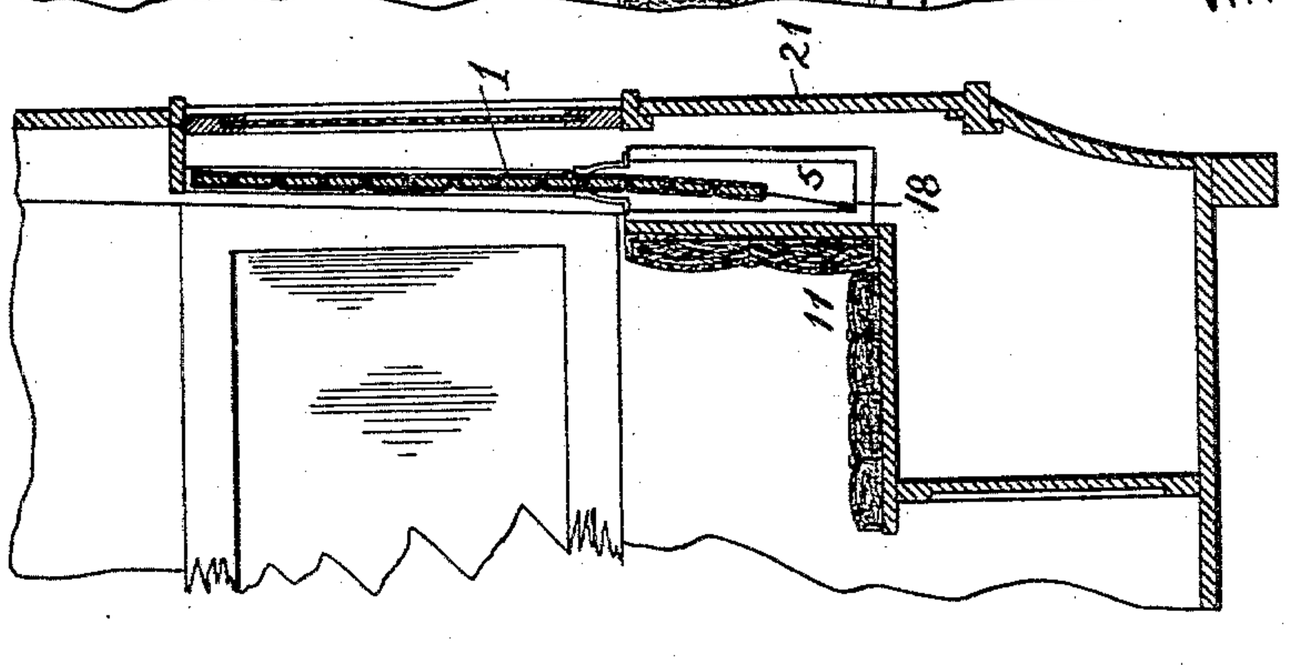

Fig. 6.

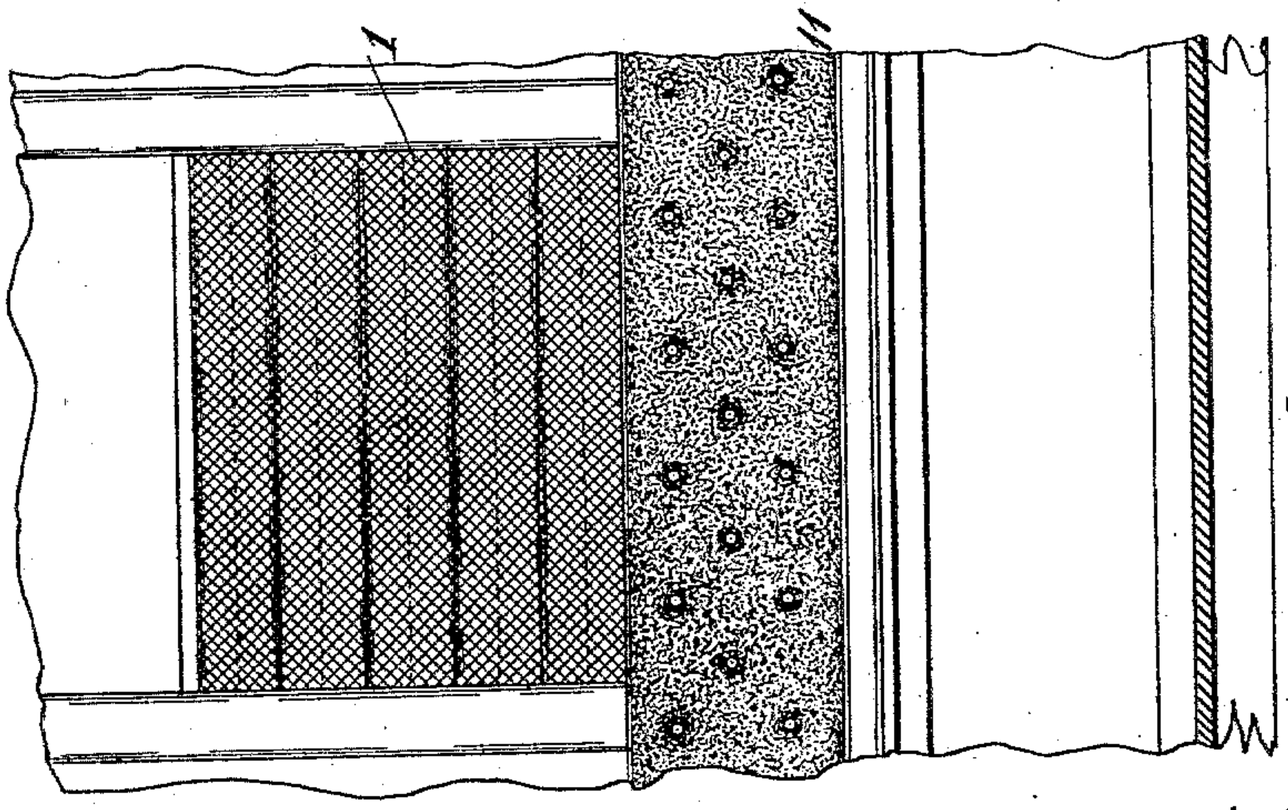

Fig. 7.

WITNESSES

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UNITED STATES PATENT OFFICE.

EDMUND H. DUCHEMIN, OF NEWBURYPORT, MASSACHUSETTS.

CURTAIN.

SPECIFICATION forming part of Letters Patent No. 597,402, dated January 18, 1898.

Application filed March 30, 1896. Serial No. 585,507. (No model.)

To all whom it may concern:

Be it known that I, EDMUND H. DUCHEMIN, of Newburyport, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Curtains, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to improvements in curtains for street-cars and other purposes, but especially for use in that class of cars known as "summer" or "open" street-cars; and the object of my invention is to provide a weatherproof self-folding curtain therefor of such a nature that it can be placed between the upright posts thereof in such a manner that it can be drawn down or up in a curved or straight line, as the outline of the face surface of said posts may require, and will be unyielding, so that when in the event of wind and rain it is necessary to draw the curtain down to the floor of the car it will become practically a section of a wall and will resist the action and protect the passengers from the effects of the same and also will remain stationary in any position in which it may be placed between the name-board and floor of the car for their comfort. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a view of a portion of a car, showing the position of my curtains between the posts thereof, one being drawn down to the floor of the car and the other a part of the distance. Fig. 2 is a cross-section of a car, showing the position of the side margin of my curtain when drawn down in its leading-groove in the post of the said car and the said leading-groove. Fig. 3 is a cross-section detail of the upper end of the post, intended for reference, showing my curtain as folded together and secured in its position between the name-board and the inside casing or lining of the wall of the car and the manner in which it is held in position therein by the action of the curtain spring-checks intended for that purpose. Fig. 4 is a cross-section detail of the post midway, also intended for reference, having its front surface cut away in line with the front wall of the leading-groove to show the position of the side margins of the curtains and also of the elastic friction-plates therein, one friction-plate being omitted for the purpose of showing the metal guards that are secured on the extreme ends of the curtain-slats. Fig. 5 is a cross-section on line 5, Fig. 4, showing the longitudinal form of the elastic friction-plates and their position on the margins of the curtain. Fig. 6 is a cross-section detail of my curtain, showing the manner in which the cross parallel slats therein are fastened between the opposite layers of the material of which it is made to insure the folding of the curtain-slats alternately in opposite directions. Fig. 7 is a longitudinal detail of an interior portion of a closed or box car, showing my curtain drawn up from the bottom of the same. Fig. 8 is a cross-section on line 8, Fig. 7, showng the position of my curtain when drawn up. Fig. 9 is similar to Fig. 7, showing my curtain as partially drawn horizontally. These last-named three figures are simply details intended to show the different ways in which my curtain can be adapted for different purposes.

Similar figures refer to similar parts throughout the several views.

My curtain 1, Fig. 1, consists of a series of thin parallel non-metallic slats 3 of a rigidly-inflexible nature, preferably of wood, that are secured together edgewise, so that when the curtain 1 is unfolded their adjacent edge surfaces are held in close contact by means of continuous folding joints formed by two pieces of prepared cloth 2 or other suitable such like material, which are joined together between the edge surfaces of the slats 3 by a continuous—that is, an unbroken—row of stitches placed alternately on a level with the opposite surfaces thereof, which causes them to fold one over another from opposite directions without the aid of other assistant mechanical devices, as shown at 4, Fig. 6, thus forming when folded a compact mass of folds, as shown at 1, Fig. 3, which when the curtain is secured in its position in the car will be held in the desired position in a vacant space formed by the frame-plate 6, the name-board 7, and the inside casing 8 of the wall of the car, as shown at 1 5 6 7 8, same figure, by means that will be described at the proper time herein, and when unfolded, by means of the continuous folding joints which connect together and keep the adjacent edge surfaces of the slats 3 in close contact, prevent

independent lateral movement at their folding joints 4 and keep them rigidly in line with the opposite faces of the curtain 1, thus causing each slat 3 to consolidate with and strengthen the action of the others in such a manner as to secure the passengers from the action of wind and rain. The opposite side surfaces of the posts 9, Figs. 2 and 3, are provided with leading-grooves 10, which are fitted to receive the side margins of the curtains so they can be moved freely up and down therein and are made about one-half an inch deep, more or less, as the dimensions of the curtain or the thickness of the posts 9 will admit.

The leading-groove 10 commences near the upper end at the longitudinal center of the frame-post 9 and inclines outward until it reaches the level of the car-seat 11 in such proportion as will bring the leading-groove 10 to the outside surface of what is termed the "seat-panel" 12 and from thence continues in line therewith down to the floor of the car. The upper end of each of the leading-grooves 10 terminates in a recess 13 (see Fig. 3) of equal depth therewith and of such proportion as will admit free of contact with its walls the lateral movement of the curtain during the process of folding and unfolding. On each side of the recess 13, secured to the side surface of the frame-post 9, is a spring check or latch 14. (See Figs. 2 and 3.) Their free ends terminate in a right angle, the horizontal surfaces of which are placed on a level with the lower surfaces of the name-board of the car 7 and casing 8 and extends inward therefrom a sufficient distance to retain when not in action the folded part of the curtain in its proper position in the vacant space 5 and when being drawn down in any position in which it may chance to be placed. Their perpendicular arms rest in inlets 15 made in the lower inside surfaces of the said name-board 7 and casing 8, as shown in Fig. 3.

The extreme ends of the curtain-slats 3 are fitted with metal guards 16 to prevent premature wear of their extreme ends (shown at 16, Figs. 4 and 5) and also are provided with elastic friction-plates 17.

The friction-plates 17 (see Figs. 3 and 4) are the same width as the curtain-slats 3. Their free ends curve slightly outward, and when secured in position on the curtain are a trifle in the rear of the end surfaces of said slates 3, for a purpose that will be explained presently.

To secure the curtain in its position in the car, it is folded up, as shown at 1, Fig. 3, and passed into the vacant space 5, where it is secured by means of hooks and staples 18, as shown, Figs. 2 and 3, or in any other suitable manner, and is held as folded by the inwardly-projecting horizontal surfaces of the spring-checks 14. (See 14, Fig. 3.) The lowest or bottom fold is then passed through the recesses 13 in the posts 9, between which the curtain is to operate, and the marginal edges drawn into the leading-grooves 10, as shown at 1, Fig. 3.

In practice when the curtain is drawn down the slat 3 that is being unfolded acts as a lever against the spring-checks 14 and sends them outward the required distance to allow the fold to pass down through the recesses 13 and into the leading-groove 10, and when the fold has passed the spring-checks 14 spring back and resume their normal position in readiness to support the remaining folded portion of the curtain 1, when the next fold repeats the same action on the opposite spring-checks 14, causing the same results, and so on until the curtain is drawn down to any desired position between the name-board 7 and the floor of the car. In drawing the curtain up the action of the folding parts on the spring-checks 14 are the same as just described, (reversed,) the curtain-slats 3 being during the operation held firmly in position by the action of the leading-groove 10 until the curtain-slats 3 enter, one after another, successively the recesses 13 and, as they pass, are made, by the peculiar position of the stitching or fastening (shown at 4, Fig. 6) to fold alternately in opposite directions, as before stated, each succeeding slat 3 pushing the mass that is being folded onto the horizontal surface of the spring-check 14 that is opposite to the free marginal surface of the slat 3 that is in the act of folding, by the pressure of said free end against the inside surfaces of the check-springs 14 nearest thereto, until the perpendicular arm thereof rests against the wall of the inlet 15 in the name-board 7 of the car, which occurs when the fold is half completed, when, as the spring-checks 14 cannot yield any farther, the mass of folds that is made is, by the action of the slat 3 that is being folded, pushed onto the horizontal surface of the spring-checks 14, as stated.

The curtain 1 when being drawn down is held where placed by the action of the elastic friction-plates 17, which press against the opposite walls of the leading-grooves 10 with sufficient force for that purpose, thus performing the double function of holding the curtain 1 where it is placed and preserving its surface from contact with the side walls of the grooves 10.

I have thus far described my curtain as it is adapted for use in open or summer street-cars, in which it is necessary that it should be folded and unfolded from above, while for use in box or closed street-cars it will be adapted to hold together in a space 5 between the outer wall 21 and the back of the seat 11 of the car, as shown at 1, 5, and 21, Fig. 8, and drawn upward or to be drawn out horizontally, as shown at 1, Fig. 9, in which event it would be folded at one or at both sides of the window-frame, as the curtain might be adapted to be drawn entirely from one side or half-way from both and meet at the center, as necessity or choice may dictate. In either of these cases, how-

ever, leading-grooves would have to be provided for the guidance of the curtain and suitable slots made in the sills or side posts of the window-frames for its passage therethrough, nor, as the curtain is self-folding, would there be necessity for the spring-checks 14, as they are intended and required simply to hold the folded portion of the curtain in position where it is drawn from above; but as the details required for adapting my curtain to these different purposes are intended to form the subject-matter of applications for other patents it would be inexpedient to explain the same any more fully herein.

The especial benefit derived by the use of my curtain in open cars is that the cross-slats 3 being unyielding keeps the margins thereof firmly in the leading-grooves 10 of the posts 9, while by the peculiar arrangement the curtain can be drawn down through said leading-grooves 10 from the roof to the floor of the car in any direction or curve indicated by the face surface of said posts 9, and thus form a weatherproof compartment to protect the passengers and their apparel from the damaging effect of wind or rain.

It will be understood that I do not claim my curtain as exclusive of others that are or may be hereafter placed in street-cars, and also that I do not confine myself to the particular mechanical construction of my curtain as hereinbefore described, as there are other different ways for so doing—as, for instance, the strips of material 2 may be placed alternately on the opposite surfaces of the slats 3, which would produce the same results in folding and hold the adjacent raw or uncovered edge surfaces of the slats 3 in close weatherproof contact, or the folding joints 4 may be secured unto the edge surfaces thereof. It will also be understood that it is the slats 3 that form my curtain 1, the pieces of prepared cloth 2 being simply auxiliaries thereto for the purpose of forming the folding joints 4, and, furthermore, that as I am aware that it is a common and necessary usage to place slats in curtains for strengthening and other purposes and to cover the same with the material of the curtain when they are so placed I do not claim doing so as patentable, nor as all curtains are weatherproof to a greater or less extent do I claim mine as such to the exclusion of others, but simply as a self-folding curtain of that class, the gist of my invention residing in the peculiar construction of my curtain, whereby it is made self-folding when being sent up and rigidly inflexible when drawn down to any desired position between the name-board 8 and the floor of the car and absolutely weatherproof against the action of wind and rain at all times.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In open street-cars, the combination, of the chamber between and at the upper end of the car-posts thereof, the recesses at the upper end of the grooves in the car-posts, the spring-checks secured to the side surfaces thereof, and the improved self-folding weatherproof curtain, all constructed and arranged to operate substantially as described for the purposes set forth.

2. In a self-folding curtain, in combination, the parallel slats 3, the metal guards on the extreme ends thereof, the friction-plates secured on the opposite faces of the same, and the layers of cloth or other suitable material, having the said slats inclosed therein all constructed and arranged substantially as described for the purposes set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 18th day of March, A. D. 1896.

EDMUND H. DUCHEMIN.

Witnesses:
JOHN F. MCKAY,
WILLM. DUCHEMIN.