

Sept. 20, 1932.

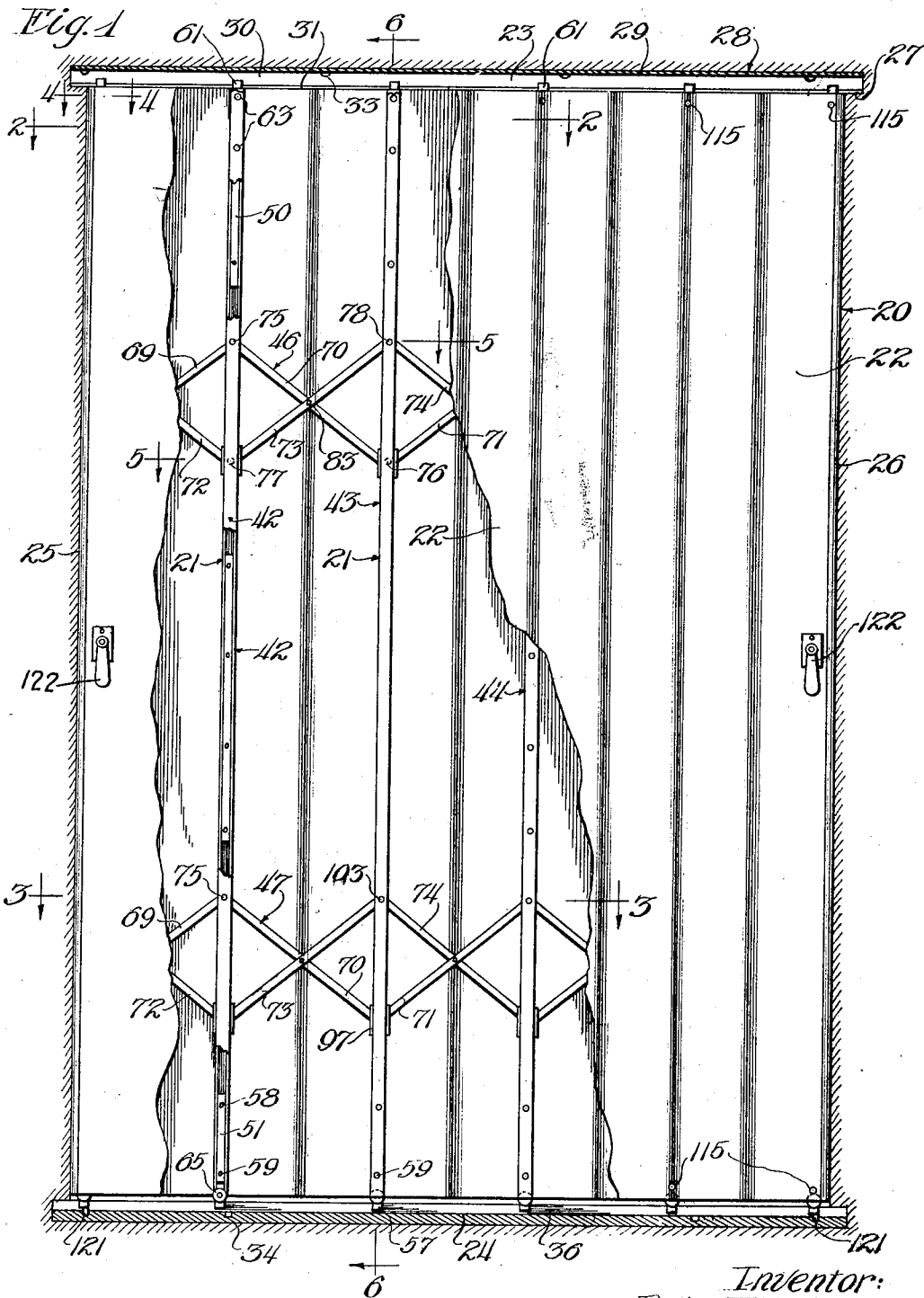
P. E. ERLINDER

1,877,829

FOLDABLE CURTAIN

Filed Sept. 6, 1928

5 Sheets-Sheet 1



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Sept. 20, 1932.

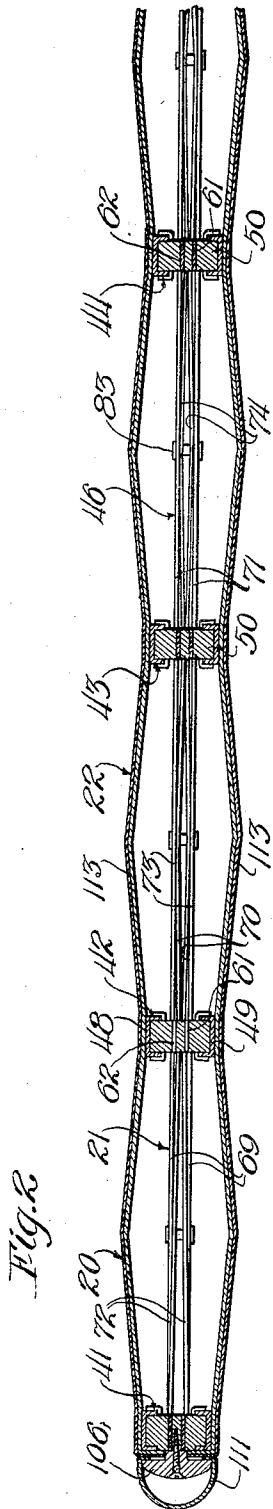
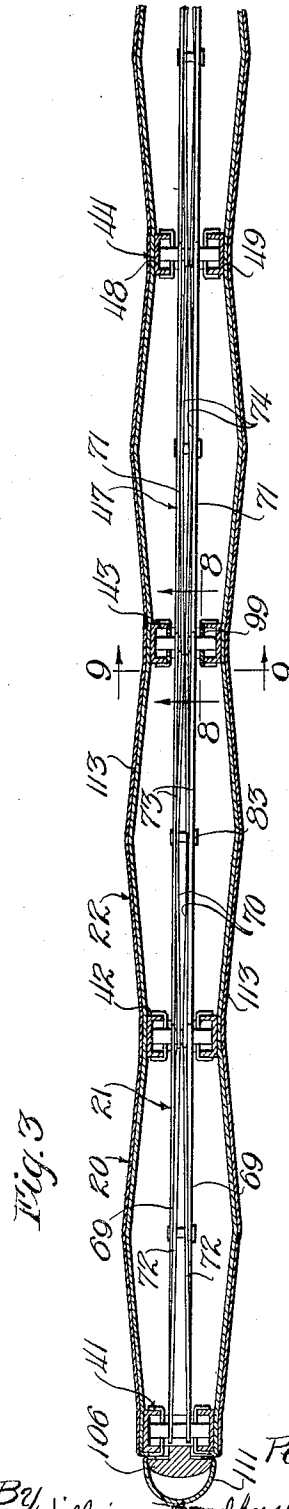
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FOLDABLE CURTAIN

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5 Sheets-Sheet 2



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1,877,829

FOLDABLE CURTAIN

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5 Sheets-Sheet 3

Fig. 4

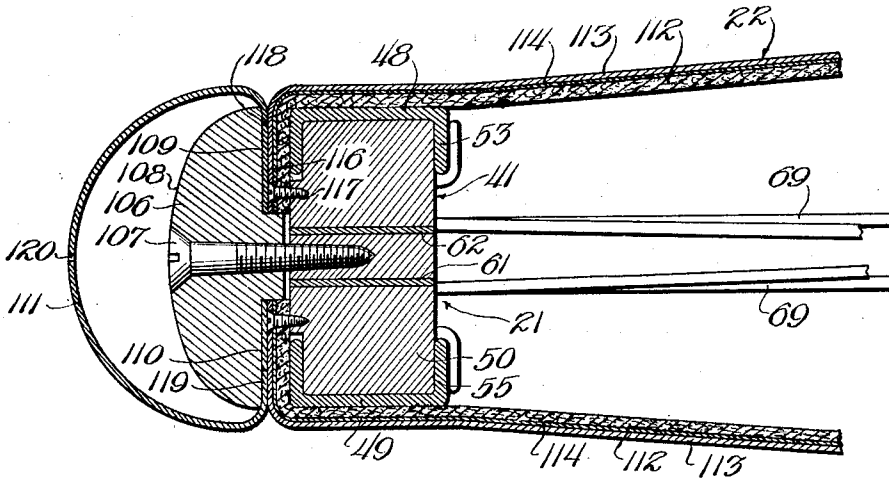
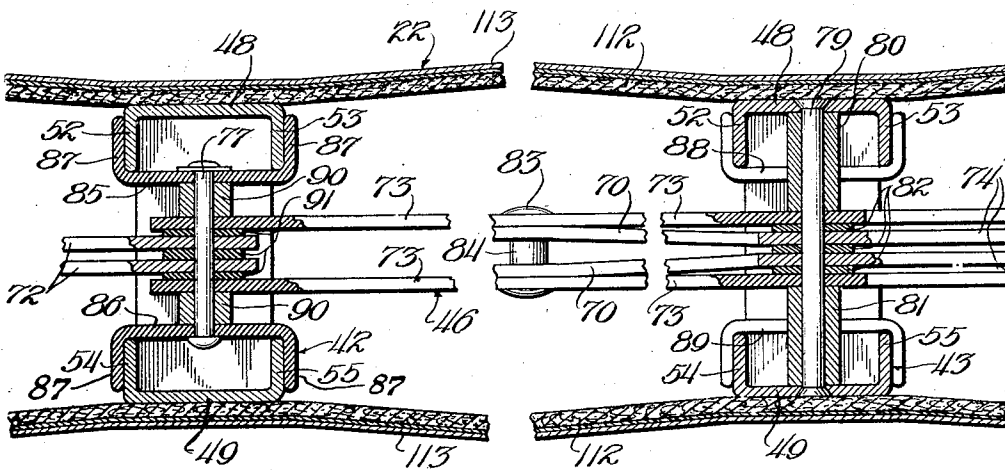


Fig. 5



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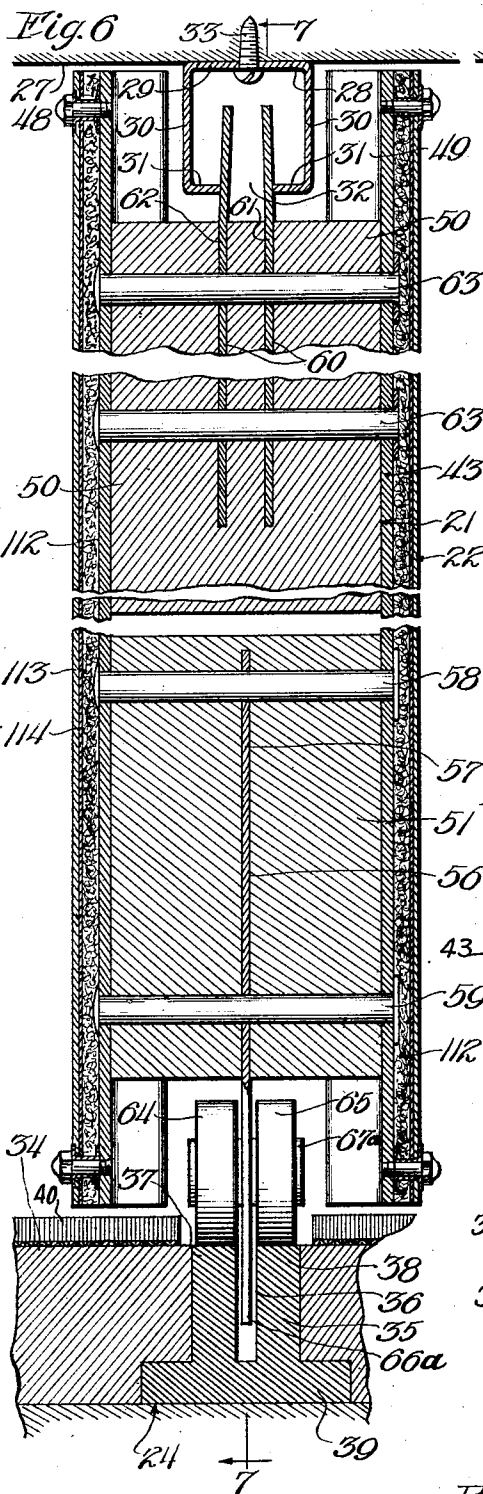
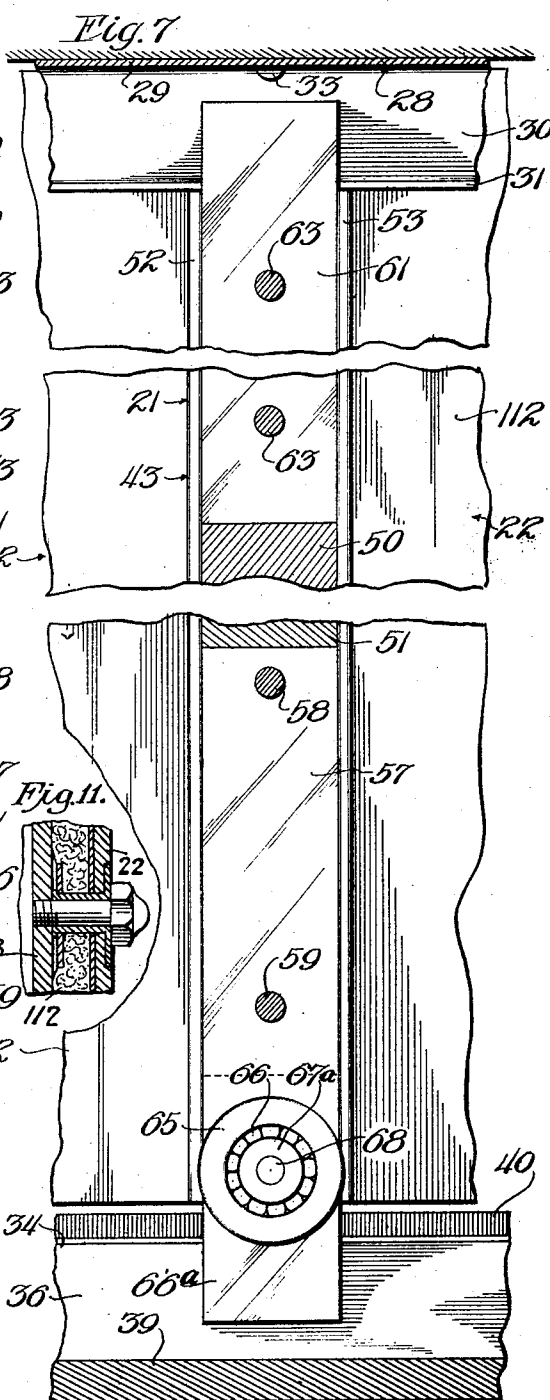
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FOLDABLE CURTAIN

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5 Sheets-Sheet 4



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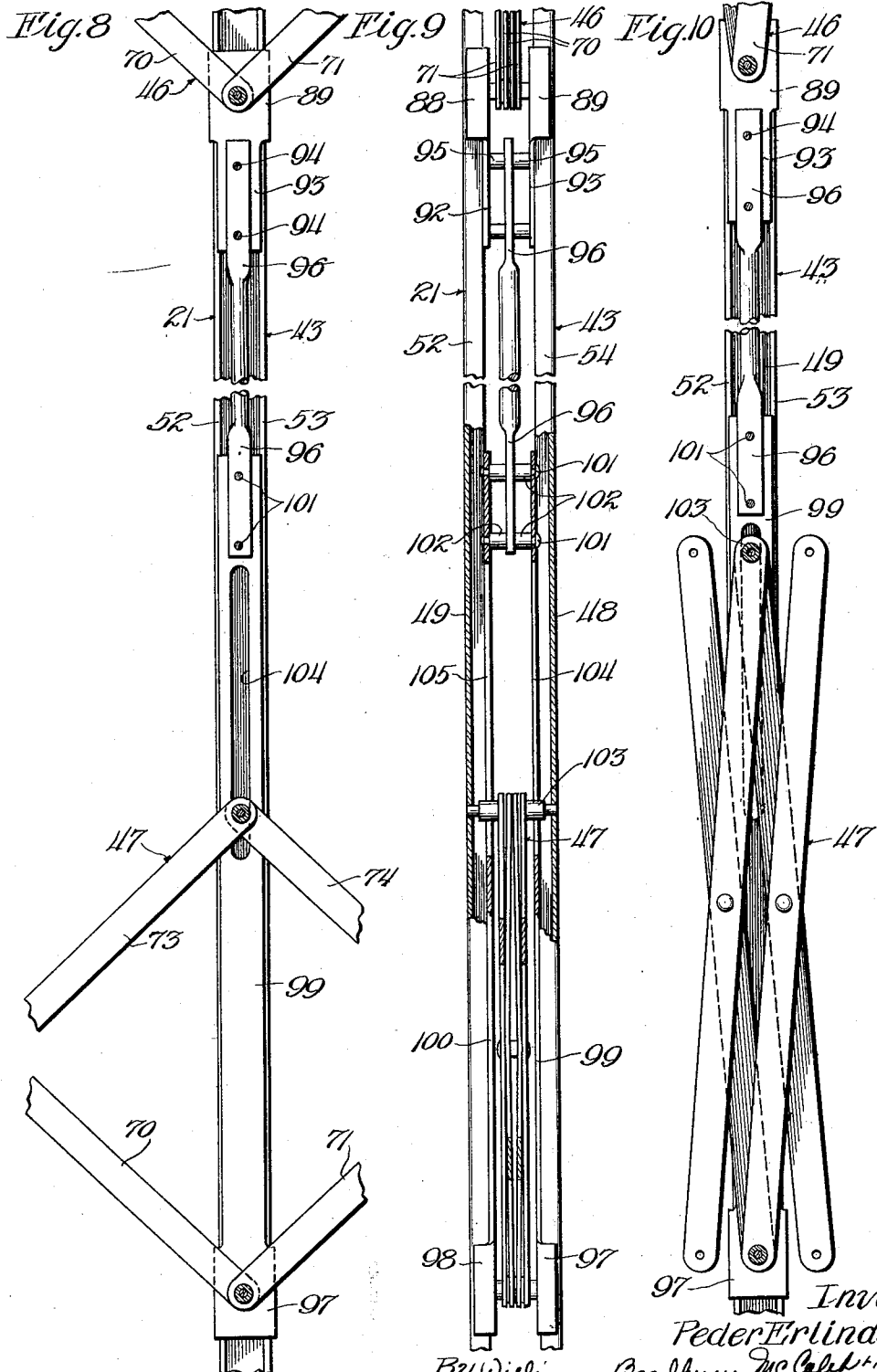
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Filed Sept. 6, 1928

5 Sheets-Sheet 5



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FOLDABLE CURTAIN

Application filed September 6, 1928. Serial No. 304,187.

The present invention relates to foldable curtains and is particularly concerned with curtains adapted to be used as closures or for separating a large room into two or more smaller rooms.

The invention is of particular importance for use in hotels, auditoriums, studios, sales-rooms, funeral parlors, churches, schools, banks, gymnasiums, hospitals, and the like where it is necessary to provide large rooms or halls for accommodating a large assembly of people but often desirable to utilize only a part of the space for a small assembly.

One of the objects of the invention is the provision of an improved foldable curtain of the class described which is adapted to replace the unsightly and bulky folding or sliding doors of the prior art.

Another object is the provision of an improved construction for the extensible framework employed in folding curtains of the class described, which is adequately reinforced against lateral bending.

Another object is the provision of an improved structure for assuring the uniform extension of the extensible framework employed for supporting the foldable curtain.

Another object is the provision of a foldable curtain of the class described, having a removable covering of ornamental and sound insulating material so that the scheme of decoration may be changed whenever desired.

Another object is the provision of a novel trussed extensible member for foldable curtains of the class described which is practically rigid against lateral forces and which includes means for maintaining the stiles at substantially right angles to the direction of extension.

Another object is the provision of a foldable curtain of the class described including a novel assembly of elements consisting of an extensible framework, a flexible envelope for covering the same and a novel mode of support for said flexible envelope whereby pre-

determined lines of tension are produced for assuring the outward folding of the curtain at these points.

Other objects and advantages of the invention will be apparent from the following description and from the accompanying drawings, in which similar characters of reference indicate similar parts throughout the several views.

In the drawings, of which there are five sheets,

Fig. 1 is an elevational view partially broken away to show the interior structure of the curtain;

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1 looking in the direction of the arrows;

Fig. 3 is a similar view taken on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged detail sectional view taken on the line 4—4 of Fig. 1.

Fig. 5 is a similar view taken on the line 5—5 of Fig. 1;

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 1;

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 6;

Fig. 8 is a medial sectional view of the connection between the extensible members, taken on the line 8—8 of Fig. 3;

Fig. 9 is a sectional view of the same mechanism taken on the line 9—9 of Fig. 3 with the extensible members in folded relation;

Fig. 10 is a view similar to Fig. 8 with the extensible members folded; and

Fig. 11 is a fragmentary, sectional view of one of the points of attachment of the curtain, showing the bolts which pass through eyelets in the curtain and are threaded into the frame.

Referring to Fig. 1, 20 indicates my foldable curtain in its entirety and the curtain preferably includes an extensible framework 21, a flexible covering or envelope 22 for one or both sides of the curtain, and means for

guiding the curtain which may consist of guides 23 and 24 at the top and bottom of the curtain.

In Fig. 1, 25 and 26 indicate the sides of an opening such as a door opening or the walls of a room which is to be divided by the foldable curtain 20. The ceiling 27 is preferably provided with means for guiding and supporting the curtain against lateral thrust which may consist of a channeled metal member 28 having an attaching flange 29, two downwardly extending flanges 30 and two inwardly extending flanges 31, leaving a longitudinal slot indicated at 32. The guide 28 may be secured to the ceiling by a plurality of screws 33 and, if desired, this guide may be made flush with the ceiling.

The floor 34 is preferably provided with a guide 35 installed flush with the surface of the floor in order to present a smooth upper surface which will not mar the appearance of the floor. The guide 35 is provided with a longitudinally extending slot 36 between two upwardly extending legs 37 and 38 and the guide is provided with a flanged base 39 for the purpose of anchoring the guide in a floor of plastic composition or for securing the guide to the joists when the guide is laid flush with a wood floor. The carpet or rug 40 may project beneath the curtain on each side to the edge of the guide 35.

The extensible framework 21 preferably consists of a plurality of stiles 41, 42, 43 and 44, the number of stiles depending upon the size of the opening intended to be closed by the curtain and the stiles 41 to 44, etc., are joined together by one or more extensible members indicated in their entirety by 46 and 47. Referring to Figs. 4, 6 and 7, I shall now describe the construction of the stiles in detail. The stile 43 is representative of the ordinary stiles employed intermediate the ends of the curtain, and these stiles may be formed of a pair of flanged metal members 48 and 49 having their flanges inwardly turned to embrace spacing members 50 and 51. The flanged members 48 and 49 are of substantially U-shape, having the inwardly projecting flanges 52, 53, 54 and 55, and the members 48 and 49 are of sufficient length to extend from a point just above the carpet 40 to a point immediately adjacent the ceiling 27.

At each end of the stile 43 the flanged members 48 and 49 may be secured together by providing spacing members 50 and 51, preferably in the form of blocks of wood, and these spacing members may also be employed for supporting the guide members carried by the stiles and adapted to slidably engage the guides 28 and 35.

For this purpose the lower block 51 may be provided with a longitudinally extending saw cut 56 and a guide plate 57 may be inserted in the saw cut, after which the flanged

uprights 48 and 49, the block 51 and the guide plate 57 may all be secured together simultaneously by rivets 58 and 59 passing through all of these members and clamping them together.

The structure at the upper end of the stile 43 is substantially the same except that a pair of longitudinal saw cuts 60 are made and after resilient guide plates 61 and 62 are inserted in the slots formed, the flanged members 48, 49, the block 50, and guide plates 61, 62 are all secured together by rivets 63. The guide plates 61, 62 are sufficiently spaced from each other so that their upper ends may resiliently engage the flanges 31 of guide 28, within the slot 32, thereby guiding the curtain in its extension and in the folding operation.

The spacing block 50 is located sufficiently below the upper end of the stile 43 in the present embodiment so that the guide 28 may be received between the channeled members 48 and 49 which comprise the stile 43. The lower guide plate 57 may rotatably support a pair of rollers 64 and 65, spaced from the lower end 66 of the guide plate in such manner that the end 66 projects in slot 36 of guide 35 when the rollers 64 and 65 engage the top of guide 35 at the floor surface. Rollers 64 and 65 are provided with ball bearings 66a rotatably supported between the race-ways 67a carried by rivet 68. The block 51 is likewise spaced from the lower ends of the stile 43 in order to make room for the rollers 64 and 65 which support the curtain upon guide 35.

The stiles 41 to 44 are preferably connected by a plurality of extensible members 46 and 47. As these extensible members are identical in form, the description of one of them will suffice. The extensible member 46 comprises a plurality of pivoted links arranged in two sets which may be described as follows.

One set of the links comprising the links 69, 70, 71, etc., consists of links pivoted end to end and extending from one edge of the curtain to the opposite edge. Another set of links comprising links 72, 73, 74, etc., likewise consists of links pivoted end to end, each of the links of the latter set crossing one of the links of the former set and being pivoted to the crossed link at its mid-point. Thus link 70 is pivoted to link 69 at its upper end 75 and at its lower end link 70 is pivoted to link 71 at the point 76. Link 73 is pivoted at its lower end 77 to link 72 and at its upper end at the point 78 to the link 74. Also the links 70 and 73 are pivoted to each other at their mid-point.

As this structure is identical throughout the extensible members 46 and 47, it is unnecessary to enumerate each of the links and it is sufficient to say that extensible members 46 and 47 may be made as long as possible by

merely adding further links forming a structure similar to that just described.

In order to assure the uniform extension of the curtain the expansible members 46 and 47 are pivotally attached to the stiles 41 to 44 at the upper pivotal points 75, 78, etc., of the extensible members. One of these upper pivotal points is shown in detail in Fig. 5 at the right in which 79 indicates a rivet passing through the channeled members 48 and 49 intermediate the spacing blocks 50 and 51. The rivet 79 is provided with a pair of tubular spacing members 80 and 81 at each end immediately adjacent the flanged members 48 and 49.

According to the present invention the links which comprise extensible members 46 and 47 are preferably arranged with two sets of links side by side to form an extensible member which is relatively rigid against lateral thrust and certain of the links in the assembly are spaced at their mid-points and bowed together at their ends in order to form a trussed extensible member possessing the property of great lateral rigidity.

In the present embodiment the double set of links numbered 70, 72, 74, etc., comprises the links which are spaced apart at their mid-points and bowed together to meet at their ends while the links 69, 71, 73, etc., are spaced the same at their ends and their mid-points.

The rivet 79 also pivotally supports the upper ends of two substantially straight links 73 and the upper ends of two bowed links 74. The bowed links 74 are disposed between the links 73 on rivet 79 and washers 82 may be placed between each of the links on rivet 79 as shown in order to permit the links to pivot freely without scraping against each other.

Referring to Fig. 5, 83 indicates a rivet which provides the pivotal connection between links 70 and 73 at their mid-point and it will be observed that a spacing member 84 is placed at the central portion of rivet 83 with the mid-point of link 70 on said rivet against spacing member 84, and the links 73 are pivotally mounted on rivet 83 outside of links 70. As the links 70 are bowed inward from their mid-point 83 toward the end which is carried by rivet 76, no washer is required between the links at the rivet 83.

The pivotal point illustrated in Fig. 5 at the left, is representative of the lower pivotal points 76, 77, etc., on either of the extensible members 46 or 47 and consequently a description of one of these structures is sufficient. The lower pivotal points on the extensible members 46 and 47 are not rigidly connected to the stiles 42, 43, etc., but are provided with sliders 85 and 86 adapted to engage on both sides of the stiles and to maintain the stiles at right angles to the direction of extension.

Each of the sliders 85 and 86 may consist

of a relatively short piece of sheet metal of substantially rectangular form having outwardly extending flanges 87 adapted to engage outside the flanges 52, 53, 54, 55, of the channeled members 48 and 49. These sliders are also illustrated below the rivet 79 in Fig. 5 but in this instance the sliders 88 and 89 are attached to the pivotal point 76.

Each of the sliders 85 and 86 is provided with a centrally located aperture for receiving the rivet 77 and the rivet 77 pivotally supports the lower ends of links 72 and the lower ends of links 73. The links 72 are disposed in the middle and the links 73 on the outside at the rivet 77 with spacers 90 outside the links 73 on rivet 77. If desired, washers 91 may also be used between the links.

All of the lower pivotal points of the extensible members 46 and 47 are like that shown in the left-hand portion of Fig. 5 and all of the upper pivotal points of these extensible members are similar to that illustrated in the right-hand portion of Fig. 5. It will thus be observed that all the links which extend upward to the right in Fig. 1 are straight links such as the link 73, while all of the links which extend downward to the right in Fig. 1 are bowed together at their ends to form a trussed extensible member which possesses the property of great lateral rigidity.

In order to insure the uniform extension of both of the extensible members 46 and 47 together I prefer to connect a plurality of the corresponding lower pivotal points of these members together and the mechanism for accomplishing this result is illustrated in detail in Figs. 8 to 10. This connecting mechanism may be applied at any of the stiles 42, 43, etc., and the stile 43 is selected to illustrate its application.

The sliders 88 and 89 may be provided with elongated central flanges 92 and 93 for the purpose of supporting the rivets 94. The rivets 94 carry tubular spacing members 95 on each side of one end of a connecting rod 96 and the rivets provide a rigid connection between the connecting rod 96 and the sliders 88, 89. The sliders 97 and 98 carried by the corresponding lower pivotal point of the lower extensible member 47 are also provided with elongated upwardly extending strips of metal 99 and 100 and the metal plates 99 and 100 are rigidly secured to the opposite end of the connecting rod 96 by rivets 101 carrying spacing members 102.

As the upper pivotal point 103 of the lower extensible member 47 is connected to the stile 43, the plates 99 and 100 must be provided with elongated slots 104 and 105 adapted to slidably receive the rivet 103. It will thus be observed that when either of the extensible members 46 or 47 is extended, the other must be extended at the same time by

virtue of the connecting rod 96 which connects corresponding sliders on the lower pivotal points of the extensible members. The parts are illustrated in folded relation

5 in Fig. 10 but it should be noted that this figure illustrates a portion of the stile above that in Figs. 8 and 9 since the pivotal point 103 remains at the same height and the sliders 98 and 97 move downward.

10 At the right and left ends of the curtains shown in Fig. 1 the curtain is provided with end stiles such as the stile 41 shown in Fig. 4, but as each of these end stiles is identical only the end stile 41 will be described in detail. The end stile 41 is of similar construction to those previously described in that it is constructed of two channeled members 48 and 49 secured together by rivets passing through spacing blocks 50 and 51 in a similar manner to that shown in Fig. 6.

20 In order to provide a finished edge for the curtain the end stile 41 is provided with an end rail 106 of substantially the same length as the stiles and secured to the blocks 50 and 51 by a plurality of wood screws 107. The end rail 106 comprises a strip of wood which may be of any shape upon its outer surface 108 but which is provided with two substantially flat surfaces 109 and 110 for clamping

30 an end piece of fabric or other flexible material 111 upon the end stile 41. The framework of the foldable curtain is preferably covered with a flexible envelope consisting of a layer 112 of sound insulating material such as wool felt and a layer 113 of ornamental material such as velour, imitation leather, leather, tapestry or other materials suitable for upholstering and drap-

40 ing. When the outer layer 113 is cemented or otherwise secured to the relatively thick sound-proof layer 112 and the resulting flexible material is folded wrinkles appear in the layer 113 and these two layers are preferably separate layers, thereby eliminating such wrinkles. However, the sound insulating layer 112 is preferably cemented or otherwise supported upon a relatively thin layer of fabric 114 having greater tensile strength than can be attained with a layer of felt.

50 The felt 112 may be impregnated with a mineral compound for the purpose of giving fireproof qualities to it, or asbestos fibres may be employed instead of wool.

55 The flexible envelope comprising the layers 112 to 114 is preferably secured to the framework of the curtain in such manner as to produce a plurality of predetermined lines of tension along which it is desired to cause the envelope to fold. For this purpose the flexible covering is provided with a plurality of apertures along its upper and lower edges reinforced with eyelets 115 and the

eyelets 115 are located to register with the stiles 41, 42, etc.

70 The stiles are also provided with threaded apertures adjacent said eyelets 115 and the flexible covering 22 may be secured to the stiles by a plurality of screw-bolts, preferably having flat heads adapted to be received in the eyelets 115 flush with the surface of the curtain. The curtain is tensioned along the stiles 41, 42, etc., between upper and lower eyelets thereby producing a predetermined line of fold at each stile and as the curtain is attached to its framework by screw-bolts the ornamental layer 113 may be removed and changed whenever it is desired to change the scheme of decoration.

75 At the end stiles 41 the layers 112 to 114 of the flexible envelope are preferably brought around to the end of the framework as at 116 and secured by a plurality of screws 117 fixed in the blocks 50 and 51 or threaded into the channeled members 48 and 49, thereby eliminating any fastening members on the surface of the curtain at its edge. The end rail 106 is then loosely secured in place by means of the screws 107 and the end piece 111 of ornamental fabric is placed with its edge underneath the end rail 106 at 118 and 119. The end piece 111 is preferably made of sufficient width so that it will bow outward forming a resilient sealing member for engagement with the walls 25 and 26 and the end piece 111 may be provided with small apertures 120 for permitting access to the screws 107. The curtain is preferably provided with latching means 121 adapted to engage in the lower guide 24 for securing each end of the curtain in its extended relation and for securing the ends when the curtain is folded. The latching bars 121 are actuated by handles 122 and this latch equipment may be substantially the same as that described in the prior application of Carl H. Nordell and Peder E. Erlinder, Serial No. 301,528, filed August 23, 1928.

110 It will thus be observed that I have invented a foldable curtain including a novel extensible framework which is adapted to withstand any lateral thrust which may be brought against the curtain. My extensible members are in the nature of a trussed framework having a plurality of bowed links for increasing the lateral rigidity of the framework and my curtain includes means for assuring the uniform extension of the stiles at right angles to the direction of extension.

115 The novel mode of support of my flexible envelope eliminates the great labor involved in tacking the covering upon the framework and the fastening screws are only visible at the bottom and top of the curtain where they will scarcely be noticed. The entire envelope of sound insulating and ornamental material may be removed for cleaning or for access to the mechanism of the framework

and the scheme of decoration may be changed whenever it is desired.

Although I have illustrated a preferred embodiment of my invention, many modifications may be made without departure from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth, but desire to avail myself of all changes within the scope of the appended claims.

Having thus described my invention, what I claim is new and desire to secure by Letters Patent of the United States, is:

1. In a foldable curtain, the combination of a flexible envelope with an extensible framework for supporting said envelope, said framework including an extensible linkage having links bowed to increase lateral rigidity.

2. In a foldable curtain, the combination of a flexible envelope with a plurality of stiles for supporting said envelope; an extensible member connected to said stiles, said extensible member comprising a plurality of oppositely bowed pivoted links.

3. In a foldable curtain, the combination of an extensible framework, with a foldable envelope of sound insulating material, said envelope having a plurality of reinforced apertures, and a plurality of screws threaded in said framework through said apertures for removably securing said envelope to said framework, said apertures and screws being located to provide lines of tension in said foldable envelope.

4. In a foldable curtain, the combination of a plurality of flanged metal members having flanges disposed to extend inward, spacing blocks secured between said flanges to form a plurality of stiles, and a flexible envelope carried by said stiles, said envelope being tensioned along predetermined lines of fold.

5. In a foldable curtain, the combination of a plurality of flanged metal members having flanges disposed to extend inward, spacing blocks secured between said flanges to form a plurality of stiles, and a flexible envelope carried by said stiles, said flexible envelope comprising a layer of sound insulating material and a layer of ornamental material, said envelope being tensioned along predetermined lines of fold.

6. In a foldable curtain, the combination of a plurality of flanged metal members having flanges disposed to extend inward, spacing blocks secured between said flanges to form a plurality of stiles, a flexible envelope carried by said stiles, said flexible envelope comprising a layer of sound insulating material and a layer of ornamental material and said envelope having a plurality of reinforced apertures located about the outer boundary of said curtain and threaded members passing

through said apertures to secure said envelope to said stiles.

7. In a foldable curtain, an extensible member comprising a plurality of sets of links, each set comprising a succession of links pivoted end to end and corresponding links being pivoted to each other at intermediate points, and spacing means for said links at said intermediate points.

8. In a foldable curtain, an extensible member comprising a plurality of sets of links, each set comprising a succession of links pivoted end to end and corresponding links being pivoted to each other at intermediate points, and spacing means for said links at said intermediate points, certain of said links being bowed outward intermediate the ends of said links.

9. In a foldable curtain, the combination of a plurality of flanged metal members having their flanges inwardly turned, with spacers and means for securing said flanged members together, extensible members connecting said flanged members and a flexible covering for said flanged members, said covering having a plurality of spaced apertures and threaded members for securing said covering to said flanged members.

10. In a foldable curtain, the combination of a plurality of flanged metal members having their flanges inwardly turned, with spacers and means for securing said flanged members together, extensible means including a plurality of bowed links pivotally connected to said flanged members, sliders carried by other pivotal points of said extensible means and a flexible envelope removably secured to said flanged members.

11. In a foldable curtain, the combination of a plurality of flanged metal members having their flanges inwardly turned, with spacers and means for securing said flanged members together, extensible means including a plurality of bowed links pivotally connected to said flanged members, sliders carried by other pivotal points of said extensible means, a flexible envelope removably secured to said flanged members, said spacers comprising blocks having slots and guides for said curtain secured in said slots.

12. In a foldable curtain, the combination of an extensible framework with a foldable envelope for covering said framework and adapted to be extended thereby, said envelope having a plurality of apertures located to register with frame members of said framework, and said framework having threaded formations and a plurality of threaded members provided with heads for engaging complementary threaded formations on said framework, said threaded members passing through said apertures, said foldable envelope being tensioned along lines extending between predetermined apertures to cause said curtain to fold along said lines.

13. In a foldable framework, an extensible linkage comprising a plurality of links arranged in series pivoted end to end to each other, two of said series having links pivoted to adjacent links of the other series to form a parallelogram linkage, a similar extensible linkage having similar points of connection and relation, the ends of said links being arranged side by side, and spacing means located at the intermediate pivotal points of said links and adapted to spread the pairs of links, whereby said links are laterally bowed to increase lateral rigidity.

In witness whereof, I hereunto subscribe my name this 1st day of September, 1928.

PEDER E. ERLINDER.

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CERTIFICATE OF CORRECTION.

Patent No. 1,877,829.

September 20, 1932.

PEDER E. ERLINDER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 5, line 124, claim 12, after "engaging" insert the words said envelope and having threaded formations for engaging; 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 22nd day of November, A. D. 1932.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.