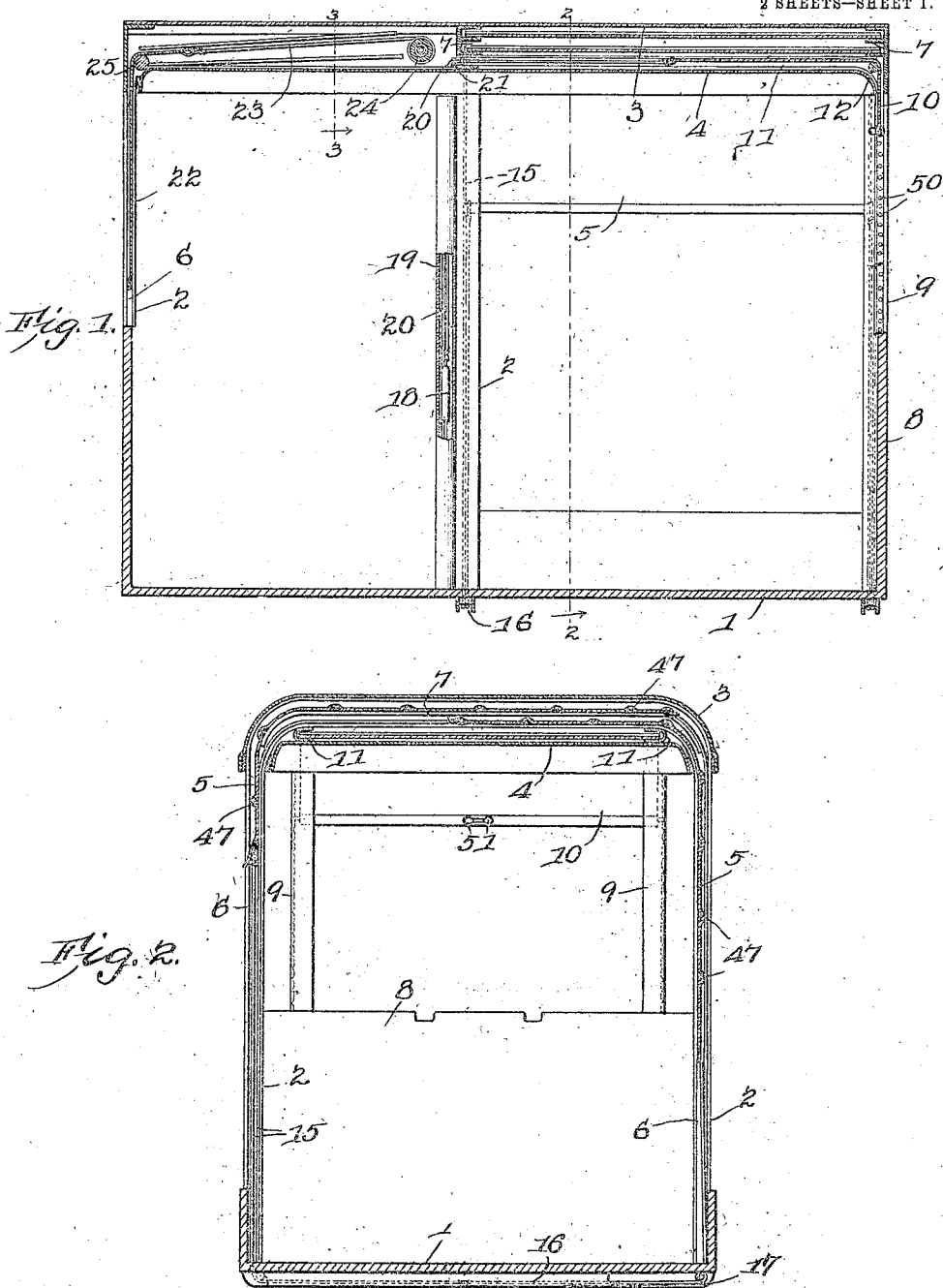


No. 827,867.

PATENTED AUG. 7, 1906.

L. HORNOR.
STORM TOP FOR VEHICLES.
APPLICATION FILED JAN. 6, 1906.

2 SHEETS—SHEET 1.



WITNESSES: 17

E. J. Bennett
Wm. Ragger

Levi Horner, INVENTOR.

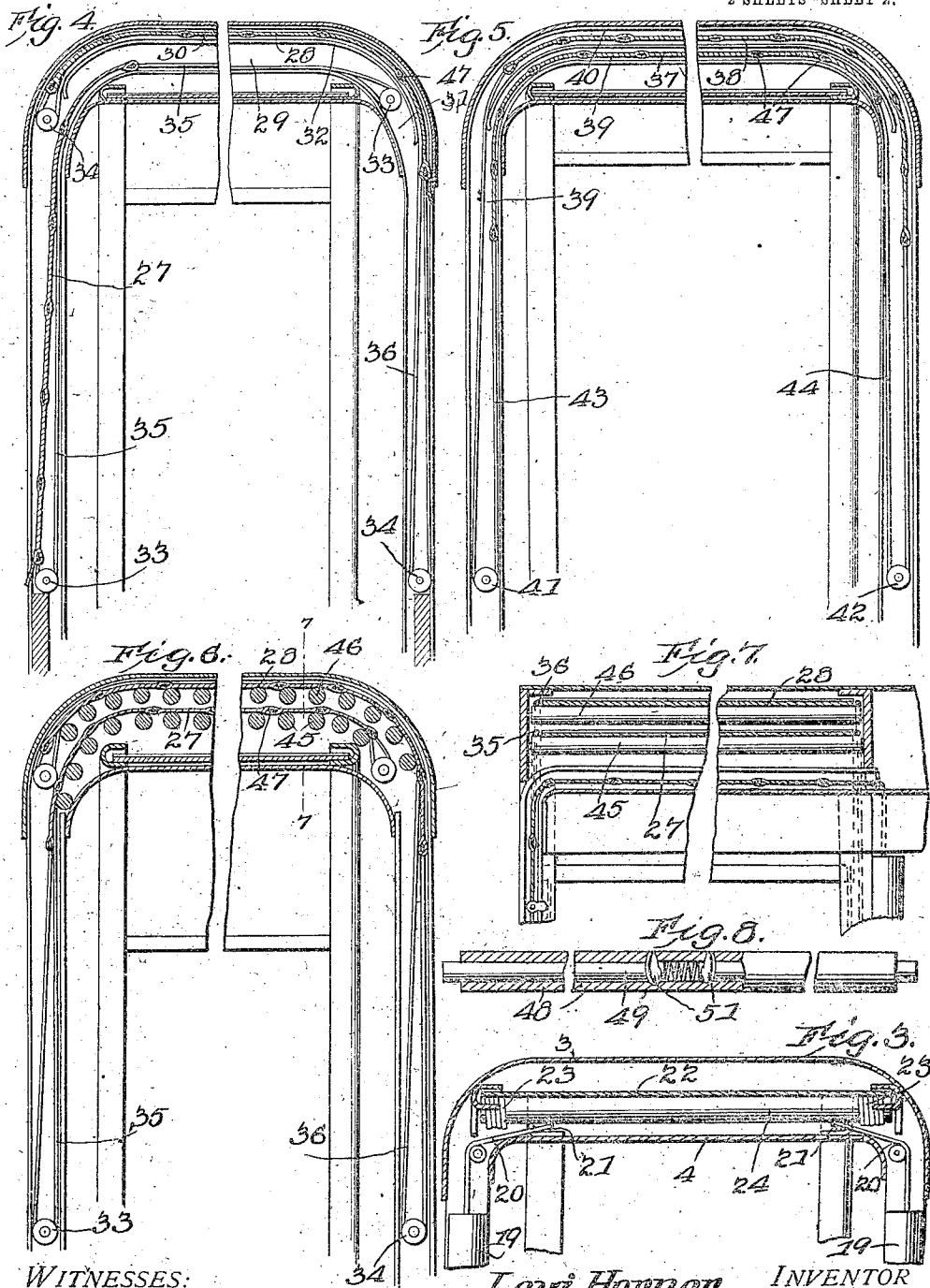
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WITNESSES:

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UNITED STATES PATENT OFFICE.

LEVI HORNOR, OF WICHITA, KANSAS.

STORM-TOP FOR VEHICLES.

No. 827,867.

Specification of Letters Patent.

Patented Aug. 7, 1906.

Application filed January 6, 1906. Serial No. 294,906.

To all whom it may concern:

Be it known that I, LEVI HORNOR, a citizen of the United States, residing at Wichita, in the county of Sedgwick and State of Kansas, have invented a new and useful Storm-Top for Vehicles, of which the following is a specification.

This invention relates to storm-tops for vehicles—such as buggies, express and other wagons, automobiles, and the like; and the principal objects of the invention are to provide simple and improved means whereby flexible side curtains may be manipulated and stored in a flat condition between the outer covering and the lining of the top where said curtains will be protected from exposure when not in use.

With these and other ends in view, which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings have been illustrated several simple and preferred forms of embodiment of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations, and modifications may be resorted to within the scope of the invention when desired.

In the drawings, Figure 1 is a longitudinal sectional view of a wagon-top equipped with storm-curains at the sides and at the front and rear ends and exhibiting different means for manipulating the curtains. Fig. 2 is a transverse sectional view taken on the plane indicated by the line 2 2 in Fig. 1. Fig. 3 is a transverse sectional detail view taken on the plane indicated by the line 3 3 in Fig. 1. Figs. 4, 5, and 6 are transverse sectional views illustrating modifications. Fig. 7 is a sectional detail view taken on the plane indicated by the line 7 7 in Fig. 6. Fig. 8 is a detail view, enlarged, illustrating a locking device applicable to the various forms of curtains.

Corresponding parts in the several figures are indicated throughout by similar characters of reference.

The curtains used in the several forms of the present invention are preferably made of flexible waterproof material. In the cheaper grades oil-cloth may be used. In better

grades leather or textile material of various grades treated with rubber or a composition containing rubber will be preferably employed, and said curtains may be provided, if desired, with windows of transparent celluloid or other suitable material. So-called "curtains," composed of wooden or metallic slats hingedly connected with each other along their edges, will, however, not be used, curtains thus constructed being objectionable on account of their excessive bulk and weight and because they are apt to produce unpleasant rattling noises. The flexible material of the curtains may, however, be reinforced at intervals by means of transverse stiffening-strips, as will be hereinafter more fully set forth.

In carrying the invention into practical operation the vehicle-body (represented at 1) is provided with bows, as 2 2, said bows supporting the stationary outer top covering 3 and the inner lining 4, between which there is an intervening space of suitable dimensions. It is to be distinctly understood that within the scope of the invention two or more bows may be employed and that these bows may be relatively arranged and spaced apart in any suitable manner, which is not regarded as being limited by the forms illustrated in the drawings.

Side curtains, as 5, are arranged to slide between a pair of bows 2 2, said bows being provided in their side edges with grooves, as 6, to accommodate the edges of the curtains. In the top members of the bows the grooves are made sufficiently wide to amply accommodate the two side curtains when lying flat one above the other, partition-flanges, as 7, being introduced to keep said side curtains properly spaced apart from each other.

In Figs. 1 and 2 of the drawings a dashboard 8 has been illustrated as being suitably connected with or located between the side members of the front bow, and between the upper edge of said dashboard at the top member of the bow there are supported vertical grooved frame members 9 9, affording guides for the front curtain 10. The spaces between the frame members 9 and the side members of the bow may be fitted with transparent or other permanent coverings. Horizontally-disposed grooved guides, as 11, for the reception of the front curtain are supported by the bows 2 2, carrying the side curtains between the permanent top-covering 3

and the lining 4 and preferably beneath the supporting means for the side curtains. A roller 12 is suitably supported to guide the front curtain from the guide members 9 into the guide members 11.

Under the construction illustrated in Figs. 1 and 2 of the drawings the side curtains are operated by sliding them up or down in the grooves or passages provided for their reception, the natural curved conformation of the bows causing the curtains to be readily and naturally guided from the vertical into the horizontal grooves, and vice versa. Owing to the flexible and collapsible nature of the material of which the curtains are constructed it becomes necessary, however, to provide means whereby the curtains will be kept taut at all times, and for this purpose flexible elements, as 15, which may consist of cords, chains, wires, or the like, are employed, said flexible elements being guided in the guide-grooves provided for the curtains and extended through guide-grooves, as 16, extending transversely beneath the bottom of the vehicle-body, the two opposite edges of the curtains being firmly attached to said flexible elements. Guide-pulleys, as 17, may be provided for the flexible elements 15 at the lower edges of the vehicle-body, as will be clearly seen in Fig. 2 of the drawings, in order to prevent excessive wear upon said flexible elements. It will be seen that under this construction the side curtains, which are themselves flexible throughout, practically form parts of endless flexible elements that are guided along the bows and beneath the bottom of the vehicle-body. It follows that when the cords or connecting elements have been properly installed and tightened the curtains will remain stretched and taut at all times, so that by simply taking hold of the lower edges of said curtains they may be readily pushed up or down and will be guided by the grooves in the bows in the proper direction and into any desired position. For the purpose of keeping the front curtain stretched and taut, so as to enable it to be conveniently and efficiently manipulated, means of a different nature have been provided, said means consisting of weights 18, slidable in tubular guides 19, which are supported adjacent to the side members of one of the bows 2, said weights being connected with the upper corners of the front curtain by means of flexible elements 20, which may be guided over pulleys 21 to prevent their exposure to friction and undue wear. These weights will be made sufficiently heavy to keep the front curtains stretched and taut in any position to which it may be moved, thus enabling said curtain to be safely and efficiently moved in the guides provided therefor. The rear curtain 22, for which guide-grooves are provided in the side members of the rear bow 2 and between the top member of the

rear bow and the adjacent intermediate bow, is connected, by means of flexible elements, such as cords 23, with a suitably-supported spring-actuated roller 24, whereby the said rear curtain is kept stretched and taut. Said rear curtain has been shown as being guided over a guide-roller 25.

Under the modified form of the invention illustrated in Fig. 4 of the drawings the side curtains (here designated 27 and 28) are guided in separate grooves 29 and 30 in the bows, one of which is shown at 31. Each guide-groove includes a vertical portion in the side member of the bow and a horizontal portion in the top member of the bow, the horizontal portions of the two grooves being separated by a partition-flange 32. Near the terminal ends of the groove 29 are pulleys 33, and near the terminal ends of the groove 30 are pulleys 34. Flexible elements, as 35 and 36, are connected with the curtains 27 and 28, respectively, and are guided over the pulleys 33 and 34, respectively. The curtains thus form parts of endless flexible elements guided over the respective pulleys, and thus kept stretched and taut, so that they may be conveniently adjusted to various positions.

Under the modified construction illustrated in Fig. 5 the side curtains (here designated 37 38) are fitted to move in grooves 39 and 40 of the same general nature as described in connection with Fig. 4. Guide-pulleys, as 41 42, are required only at the lower extremities of the respective grooves. Flexible elements, as 43 and 44, are guided over the pulleys 41 and 42, respectively, and the extremities of said flexible elements are connected with the lower edge of one curtain and with the upper edge of the other curtain, the extremities of the member 43 being connected with the lower edge of the curtain 37 and with the upper edge of the curtain 38, while the extremities of the member 44 are connected with the upper edge of the curtain 37 and the lower edge of the curtain 38, it being also obvious that the members 43 and 44 are duplicated at the end of the curtain opposite to the one which appears in Fig. 5. Under this construction it is obvious that when one curtain is manipulated a corresponding movement is transmitted to the opposite curtain, so that said curtains will be operated simultaneously and in unison.

The construction of the modification illustrated in Fig. 6 of the drawings greatly resembles that shown in Fig. 4, and the same numerals are employed to designate the side curtains and the flexible elements; but in this case the partition-flange, which in Fig. 4 is designated 32, is dispensed with and the top members of the bows afford bearings for two series of rollers 45 and 46, upon which the curtains 27 and 28 may be supported. These rollers obviously afford additional guiding as well as supporting means by the presence of

which the operation of the device is rendered more certain and its efficiency is correspondingly increased.

In the several forms of the invention the curtains may be provided with transverse reinforcing-strips, as 47; but these may be dispensed with whenever desired. In each of the several forms the lower edge of the curtain may be provided with a locking device including a tubular member, as 48, having spring-actuated locking-bolts 49 adapted to engage notches, as 50, in the grooves engaged thereby, said locking-bolts being provided with handles, as 51, whereby they may be conveniently manipulated to release them from locking engagement with the notches 50. These locking devices will be found especially useful in connection with the forms of the invention where the curtains are used in connection with springs or counterweights; but, as stated, the locking device may be applied to any or all the forms of the invention.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of this invention will be readily understood. It is simple, inexpensive, and easily applied to vehicles of all classes where it is desirable to shield the occupants or merchandise carried by the vehicles from the weather. In any of its several forms this improved device is neat in appearance and free from bulkiness. The parts employed are few and simple, and the storm-top constructed according to the principles of the invention is light, convenient, and easily operated.

It will be understood that the framework of the device may be of wood, metal, or any desired combination of materials.

Having thus described the invention, what is claimed is—

1. A vehicle-top comprising a framework, an outer permanent covering and an inner lining supported by said framework, and movable curtains guidable to a flat position and disposed one over another in the intervening space between the permanent top-cover and the lining.

2. In a vehicle-top, a framework, an outer permanent top-covering and an inner permanent lining supported by said framework, guide-grooves in the framework having horizontal portions extending between the top and the lining, curtains guidable in said grooves to a flat position and disposed one over another between the top and the lining, and means for keeping said curtains stretched and taut in any of the various positions to which they may be moved.

3. A vehicle-top including bows having guide-grooves one over another, a permanent top-covering and an inner permanent lining supported by said bows, side curtains slidable between the bows and guid-

able to a flat position between the top and the lining, and suitably-guided flexible elements connected with the curtains and combining with the latter to form endless flexible elements whereby said curtains will be maintained stretched and taut in any of the various positions to which they may be adjusted.

4. A vehicle-top including bows having guide-grooves, a permanent top-covering and an inner permanent lining supported by said bows, storm-curains guidable to a flat position between the top and the lining and movable one at right angles to the other, means for keeping the curtains stretched and taut at any of the various positions to which they may be adjusted, and locking means for securing the curtains at various adjustments.

5. A vehicle-top comprising a framework, a covering and a lining suitably spaced apart, a plurality of side curtains, means for guiding the curtains to a horizontal position one above the other in the space between the covering and lining, an end curtain guidable to a position under the side curtains, and a second end curtain guidable between the cover and lining and located at one side of the side curtains.

6. A vehicle-top comprising a framework, a covering and lining therefor suitably spaced apart, a plurality of side curtains, means for guiding the curtains to a horizontal position one above the other in the space between the covering and lining, a spring-actuated roller located between the cover and lining and at one side of the side curtains, and an end curtain attached to the roller.

7. A vehicle-top comprising a framework, a cover therefor, side curtains on the framework which are guidable to a horizontal position under the cover, means for maintaining the said curtains taut, an end curtain guidable to a position under the cover, weighted flexible elements connected with the end curtain for holding the same taut, a roller located adjacent the cover at one side of the side curtains, and an end curtain attached to the roller and guidable to a position under the cover.

8. The combination of a vehicle-body having vertically-grooved members, side and end curtains arranged with their ends guided in the grooves, means at the top of the body for receiving the curtains, and means connecting the side curtains together whereby they may be raised or lowered simultaneously.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

LEVI HORNOR.

Witnesses:

F. R. WRIGHT,

EDWIN W. GREENE.