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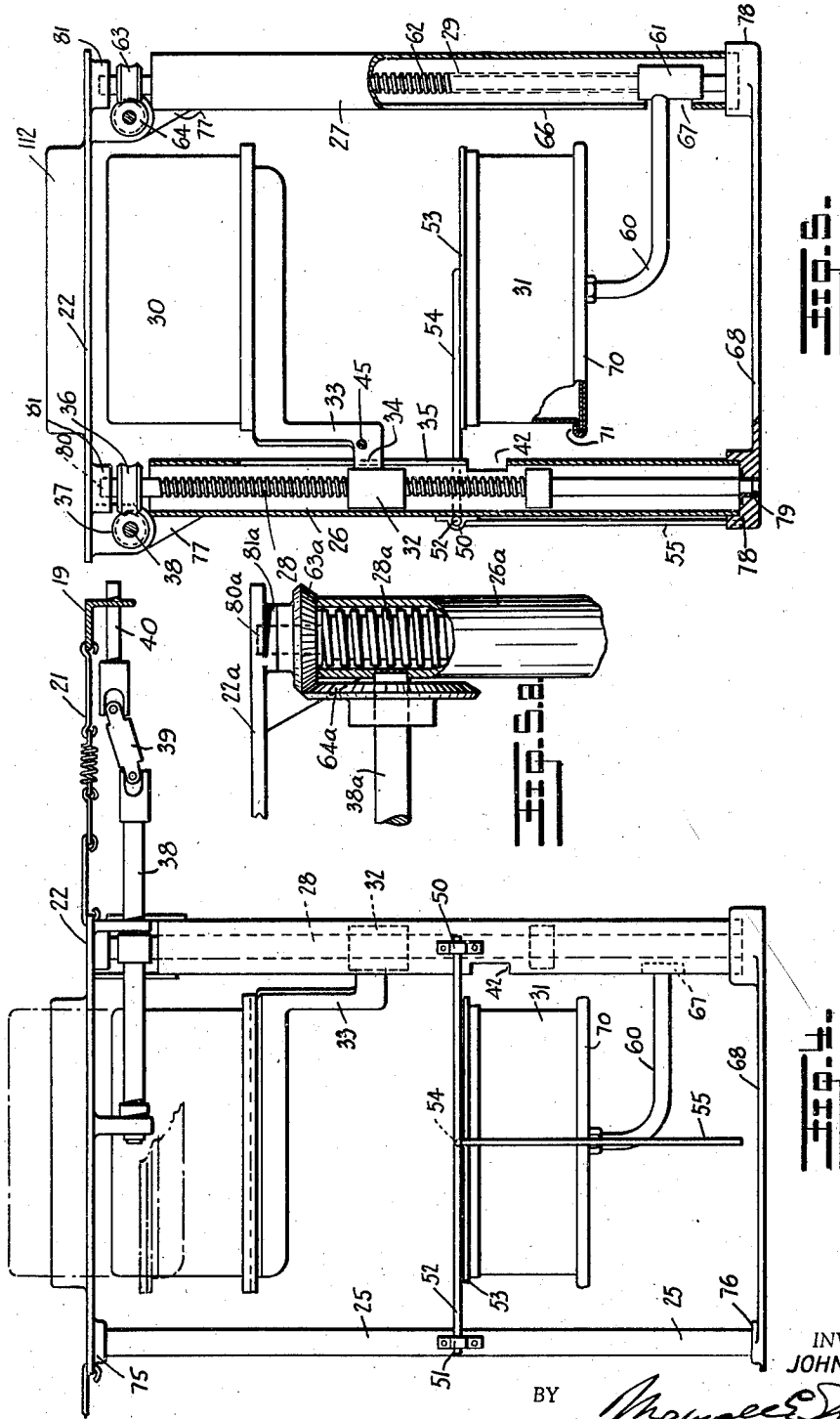
J. D. DRY

2,369,447

HOSPITAL BED

Filed Jan. 28, 1942

3 Sheets-Sheet 2



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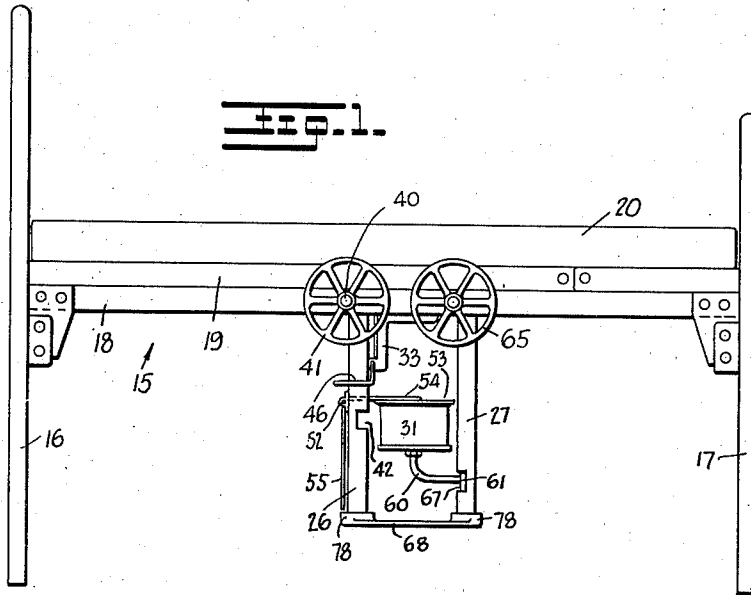
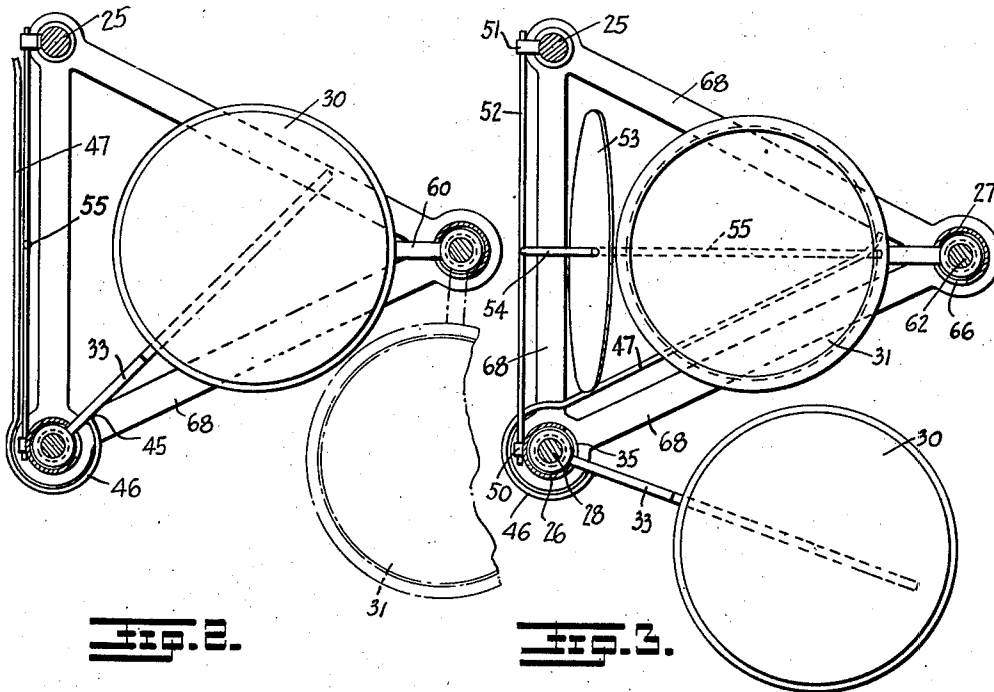
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3 Sheets-Sheet 1



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3 Sheets-Sheet 3

FIG. 6.

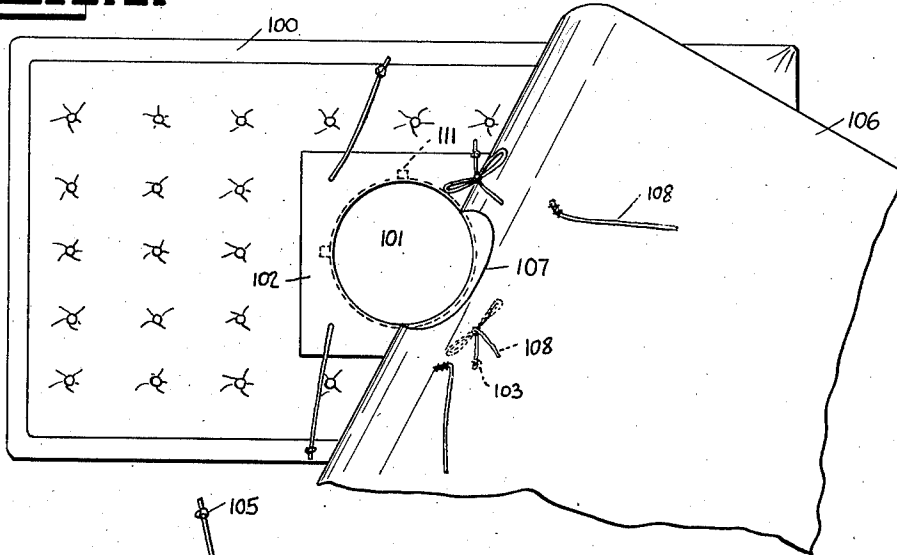
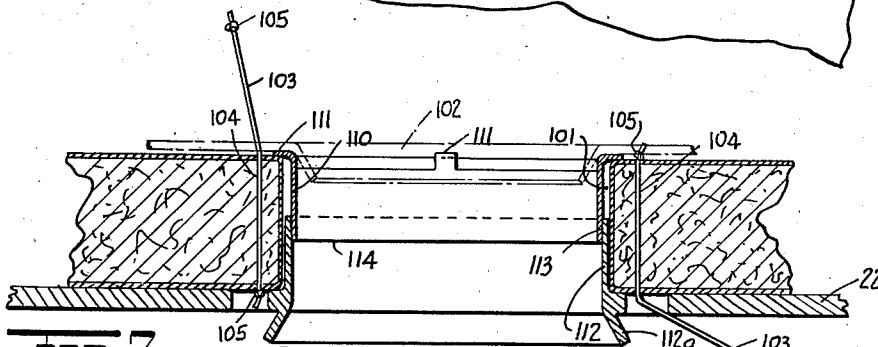


FIG. 8.

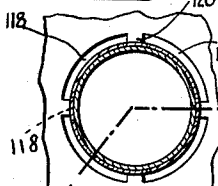


FIG. 9.

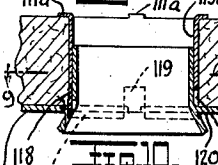


FIG. 10.

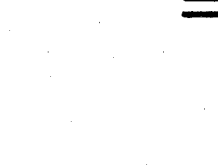


FIG. 11.

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2,369,447

HOSPITAL BED

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Application January 28, 1942, Serial No. 428,489

5 Claims. (Cl. 5—90)

This invention relates to improvements in hospital and invalid beds.

It is an object of the present invention to provide a hospital or invalid bed incorporating mechanical features for sanitarily introducing into the bed mattress a bed pan for use by the patient as desired.

It is a further object of the present invention to provide in a hospital bed equipped with a mattress having a central opening, a cushion or mattress section adapted to fill said opening and a bed pan movable to a position within the central opening, the cushion being swingable out of the way to make room for the bed pan.

It is yet another object of the present invention to provide a very simple, practical, efficient and improved invalid or hospital bed incorporating means whereby the patient may perform his eliminations without disturbing his comforts or his resting position.

Another object of the present invention resides in the provision of improved instrumentalities whereby the cover of the bed pan is automatically removed by the cushion during its swinging movement into inoperative position and replaced during its return movement.

It is another object of the present invention to provide mechanical means whereby the swinging into and out of positions of the bed pan and of the cushion is performed in the same continuous operation as the raising and lowering of the bed pan and cushion, respectively.

It is still another object of this invention to provide a mattress having a hole in the center with a rubber pad covering the area surrounding this opening in the mattress, and string or tie members for fastening the bed sheet in its proper location over the center opening of the mattress, the string members being preferably arranged so that after the mattress is turned the loose ends of the string can be pulled through the mattress, thus permitting the same length of string to be used when tying the bed sheet to either side of the mattress.

It is another object of the invention to provide a mattress for a hospital bed, the central opening for the purpose hereinabove described being provided with a sheet metal ring extending into the opening and supported from the top by a plurality of lug members, the metal ring overlapping a collar extending upward from a center plate member, thus protecting the open portion of the mattress from being soiled.

This invention accordingly consists in the features of construction, combination of parts and

in the unique relations of the members and in the relative proportioning and disposition thereof; all as more completely outlined herein.

To enable others skilled in the art to so fully comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and relation contemplated by this invention, drawings depicting a certain form of the invention has been annexed as a part of this disclosure, and in which drawings, like characters of references denote corresponding parts throughout all of the views, of which:

Fig. 1 is a side elevational view of a bed incorporating the invention;

Fig. 2 is a sectional plan view showing the cushion and bed pan in their respective central locations, with bed pan being shown in broken lines indicating its swung-out position;

Fig. 3 is a view similar to that shown in Fig. 2, the cushion being indicated as swung outwardly, the bed pan cover raised and bed pan in central position;

Fig. 4 is a sectional view of the bed pan and cushion operating mechanism;

Fig. 5 is a side view of the bed pan and cushion operating mechanism;

Fig. 5a is an enlarged detail view of a modified form of spindle driving mechanism shown in Fig. 5;

Fig. 6 is a top plan view of the mattress with bed sheet partly swung back thereby showing the central opening in the mattress with the rubber pad, and string members for securing the sheet and rubber pad to the mattress.

Fig. 7 is an enlarged cross sectional view through the central opening in the mattress; and

Fig. 8 is a sectional plan view, taken along line 8—8 of Fig. 7.

Fig. 9 is a horizontal sectional view of a modification of the mattress-opening area taken along line 9—9 of Fig. 10;

Fig. 10 is a vertical sectional view of Fig. 9 taken on line 10—10, without mattress.

Referring now more particularly to the drawings, in Fig. 1 the bed is generally indicated by the numeral 15, having the conventional head and foot pieces 16, 17, respectively, and the cross tie pieces or rails 18. Disposed above rails 18, is the conventional bed spring member 19 supporting the mattress 20. Supported by the spring members 21 is a centrally disposed plate casting 22. Three legs extend downwardly from plate member 22, namely, the solid tie leg 25, and the tubular members or housing 26, 27. Located within the spindle housing 26, is the threaded operat-

ing shaft or spindle 28, operating the mattress cushion or plug 30, while shaft or spindle 23, within housing 27 operates the bed pan 31.

Threadedly engaged on the shaft 28, is a member 32 to which is secured the arm 33 supporting cushion 30. The arm 33 at 34 extends through a slot 35 in the said tube 26. The slot 35 is of substantially the same width as the support member 33. The shaft 28 may be operated by means of a worm wheel 36 and a worm 37, worm 37 being connected by means of a shaft 38 and a universal joint or pivoted link 39 to hand wheel shaft 40 and hand wheel 41. Manipulation of hand wheel 41 thus causes raising or lowering and outward swinging movement of member 32 on shaft 28. At the lowermost portion of slot 35, is an enlarged opening 42 extending towards the operating side of the bed. Member 32 at the end of its lowering traverse reaches this enlarged opening. Friction of the threads of spindle 28 against the threads of member 32 will cause the arm 33 to rotate with the spindle and outwardly through this enlarged opening 42 and in this manner causing the mattress cushion 30, to swing outwardly in its lowered position, thus clearing the bed pan to be raised.

Secured to support member 33 at 45, is a wire loop 46 encircling the tube 26 and having a straight extension 47. Pivotedly secured to the sleeve member 26 at 50 and to the solid leg member 25 at 51, is a rod 52 to which is secured the bed pan cover 53 by means of a bracket 54. Extending below rod 52, at its center, is a swinging arm 55, which swings cover 53 into an open position and out of the way of the bed pan to be raised (see Fig. 3). This is accomplished in the following manner. When the support 33 on member 32 has reached opening 42 at the bottom of slot 35, it will swing outwardly causing extension 47 on loop 46 to swing inwardly, thereby contacting swinging arm 55 and thus rotating the rod 52 which in doing so raises cover 53.

Bed pan 31 is supported by an arm 60, secured to a member 61 adapted to ride up and down on spindle 62 within the hollow leg member 27. The spindle 62 is operated by a worm wheel 63 and a worm 64 connected to a hand wheel 65, located at the operating side of the bed and adjacent to the similar hand wheel 41. The hollow member 27 is provided with a slot 66 of the same width as the supporting member 60, thus permitting the straight up and down movement of the bed pan 31. At the bottom of slot 66 is an enlarged opening 67; and in the downward movement of member 61 on spindle 62 by manipulation of wheel 65, the arm 60 will reach the enlarged opening 67, thus permitting the friction of the threads on the spindle 62 against the threads within member 61 to swing the bracket 60 with the bed pan 31, outwardly towards the operating side of the bed.

The three leg members 25, 26 and 27 are tied together at their bottoms by means of tie members 68. Bed pan 31 is slidably supported in a tray 70 by a channel member 71.

Solid leg 25 is connected to plate 22 by means of a socket 75 and to the tie members 68 by means of socket 76. Tubular member 26 is secured to plate 22 by a bracket 77 and to tie member 68 by a boss 78. A bushing 79 is provided at the bottom of boss 78 forming a bearing for spindle 28. The top 80 of spindle 28 extends into a boss 81. The means employed for supporting hollow shaft 27 and spindle 62 are substantially the

same as that described with reference to hollow shaft 26 and spindle 28.

Referring now to Figs. 6, 7 and 8, mattress 100 is provided with a central opening 101. On top of opening 101 is a sheet 102 preferably made of rubberized material. Strings 103 pass through the mattress at 104 and are knotted at both ends 105 thus preventing the strings from slipping completely out of the mattress. Bed sheet 106 with the central opening 107 corresponding to opening 101 in the mattress is provided with four strings 108 for the purpose of tying the bed sheet 106 to strings 103, respectively, over the opening 101.

A sheet metal ring or tube 110 extends into mattress opening 101 and rests on top of mattress opening 101 by means of four lugs 111. The plate 22 is provided with an upwardly disposed circular flange or tubular member 112 which is overlapped at 113 by the downwardly disposed edge 114 of sleeve 110.

The circular flange 112 on its bottom flares out at 112a, thereby forming a funnel-shaped extension so as to facilitate the entrance of the bed pan into the opening 101 when the bed pan is raised.

In the modification shown in Figs. 9 and 10, the ring 113a having lugs 111a is provided with cut-outs 119 to clear the ribs 120 connecting the ring 113a with the plate 22a. Plate 22a has the slots 116 to clear apron portion 121 of ring 113a when the mattress is compressed by the patient.

In the modification shown in Fig. 5a, the spindle 28a within housing 26a has a bearing extension 80a, reaching into a bearing 81a of plate 22a. A bevel 63a is secured to the top of spindle 28a and meshes with a bevel gear 64a which is mounted on a shaft 38a.

The function of these bevel gears 63a, 64a are similar to that described heretofore for worm gear 63 and worm 64.

Operation

Let it be assumed that the patient (not shown) desires to use the bed pan. As shown in Fig. 1, at that point the cushion 30 is in operative position. The attendant will turn hand wheel 40 thereby lowering cushion 30 until bracket 33 reaches its lowermost position when the friction of spindle 28 against the threads of nut 32 of bracket 33 will swing bracket 33 carrying cushion 30, outward as shown in Fig. 3. The attendant will now operate hand wheel 65 which will raise bed pan 31 into operative position. Cushion 30 on its outward movement previously described has raised bed pan cover 53 by operating arm 47 against swinging arm 55, all as previously described and clearly illustrated in Figs. 2 and 3. After the bed pan has served its purpose, the same is lowered by operation of hand wheel 65 to its lowermost position illustrated in Fig. 1 and after nut 61 reaching this position, the friction of thread of spindle 29 against nut 61 will swing the bracket 60 (carrying the bed pan) outwardly, thereby facilitating the removal of bed pan 31 for dispensing purposes.

Operation of hand wheel 41 in a direction opposite to that previously described will swing inwardly the bracket 33 with the cushion 30 and the continued operation of the handle 40 will raise the same bracket 33 to position the cushion 30 within mattress opening 101.

The operation shown in Figs. 2 and 3, covering the relation of the swinging movement of the bed pan 31 and the cushion 30, may be modified to

provide movements of bed pan 31 and cushion 30 in different directions from that shown, without in any way affecting the intent or efficiency of the device.

Having thus described the invention what is claimed as new, and desired to secure by Letters Patent, is:

1. In a bed, a mattress having an opening therein, a rotatably mounted threaded shaft extending vertically downward from said bed, a housing for said shaft, said housing having a longitudinal slot, means threadedly engaging said shaft and extending outwardly through said slot, said slot providing a guide for said means whereby rotation of said shaft causes linear movement of said means, said means including a support vertically movable selectively towards and from said opening by rotation of said shaft, said slot being enlarged at one end thereof whereby upon a further rotation of said shaft said means when reaching said enlargement will rotate with said shaft causing said support to move laterally of said mattress opening.

2. In a bed, a mattress having an opening therein, a rotatably mounted threaded shaft extending vertically downward from said bed, a housing for said shaft, said housing having a longitudinal slot, means threadedly engaging said shaft and extending outwardly through said slot, said slot providing a guide for said means whereby rotation of said shaft causes linear movement of said means, said means including a support vertically movable selectively towards and from said opening by rotation of said shaft and carrying an extended element, said slot being enlarged at its lower end whereby upon a further rotation of said shaft said means when reaching said slot enlargement will rotate with said shaft causing said support to move laterally of said mattress opening, a member, means carrying said member for swinging movement thereof relative to said housing, said member carrying means having a part projecting in the path of movement of said extended element and engageable with said extended element when said extended element carrying means reaches said slot enlargement.

3. In a bed, a mattress having an opening therein, a rotatably mounted threaded shaft extending vertically downward from said bed, a housing for said shaft, said housing having a longitudinal slot, means threadedly engaging said shaft and extending outwardly through said slot, said slot providing a guide for said means whereby rotation of said shaft causes linear movement of said means, said means including a support vertically movable selectively towards and from said opening by rotation of said shaft, said slot being enlarged at its lower end whereby upon a further rotation of said shaft said means when reaching said slot enlargement will rotate with said shaft

causing said support to move laterally of said mattress opening, a swingable member, and means for causing swinging movement of said member by said shaft engaging means when the latter means rotates with said shaft.

4. In a bed, a mattress having an opening therein, a rotatably mounted threaded shaft extending vertically downward from said bed, a housing for said shaft, said housing having a longitudinal slot, means threadedly engaging said shaft and extending outwardly through said slot, said slot providing a guide for said means whereby rotation of said shaft causes linear movement of said means, said means including a support vertically movable selectively towards and from said opening by rotation of said shaft, said slot being enlarged at its lower end whereby upon a further rotation of said shaft said means when reaching said slot enlargement will rotate with said shaft causing said support to move laterally of said mattress opening, a second support, means for raising and lowering said second support relative to said mattress opening, a swingable member disposed above said second support and normally directly thereover and means for causing swinging movement of said member by said first support upon said lateral movement of said first support whereby said member is swung out of the path of movement of said second support.

5. In a bed, a mattress having an opening therein, two supports, a mechanism for moving one of said supports relative to said opening, a mechanism for moving the other of said supports relative to said opening; each of said mechanisms comprising a rotatably mounted threaded shaft extending vertically downward from said bed, a housing for said shaft, said housing having a longitudinal slot, means threadedly engaging said shaft and extending outwardly through said slot, said slot providing a guide for said means whereby rotation of said shaft causes linear movement of said means, the means of one mechanism carrying one of said supports and the means of the other mechanism carrying the other of said supports, said supports being vertically movable selectively towards and from said opening by rotation of said respective shafts, said slots being enlarged at their respective lower ends whereby upon a further rotation of a respective shaft the means engaging therewith when reaching said slot enlargement will rotate with said respective shaft causing its support to move laterally of said opening, a swingable member disposed above one of said supports and normally directly thereover, and means for causing swinging movement of said member by the other of said supports upon said lateral movement of said other of said supports whereby said member is swung out of the path of movement of said one of said supports.

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