

Dec. 14, 1948.

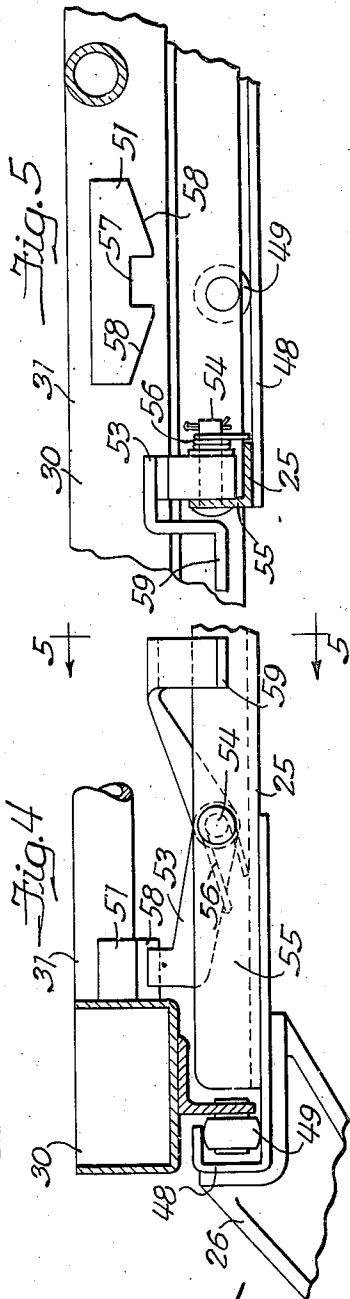
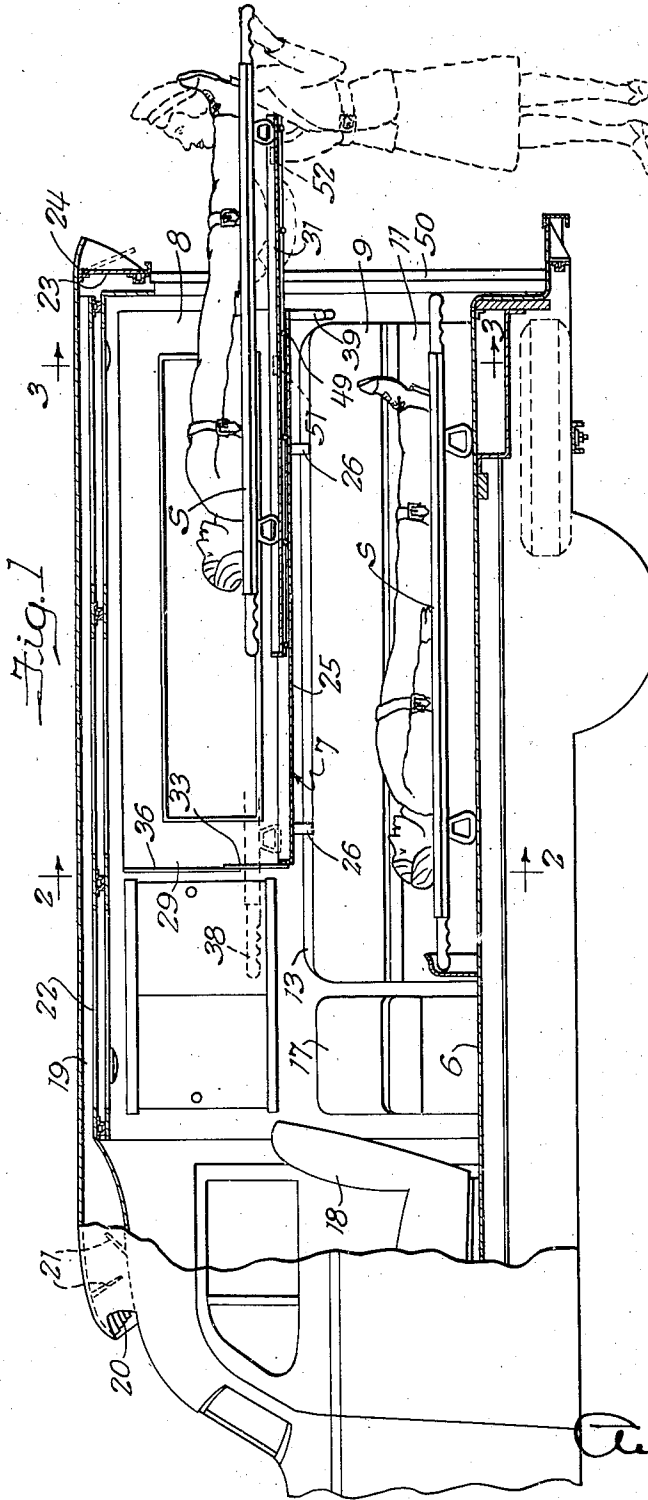
E. L. SCHOFIELD

2,456,024

FOLDABLE STRETCHER CARRIER FOR AMBULANCES

Filed March 5, 1945

2 Sheets-Sheet 1



Inventor
Earl L. Schofield
Andrew Z. (Niteray)
attys.

Dec. 14, 1948.

E. L. SCHOFIELD

2,456,024

FOLDABLE STRETCHER CARRIER FOR AMBULANCES

Filed March 5, 1945

2 Sheets-Sheet 2

Fig. 3

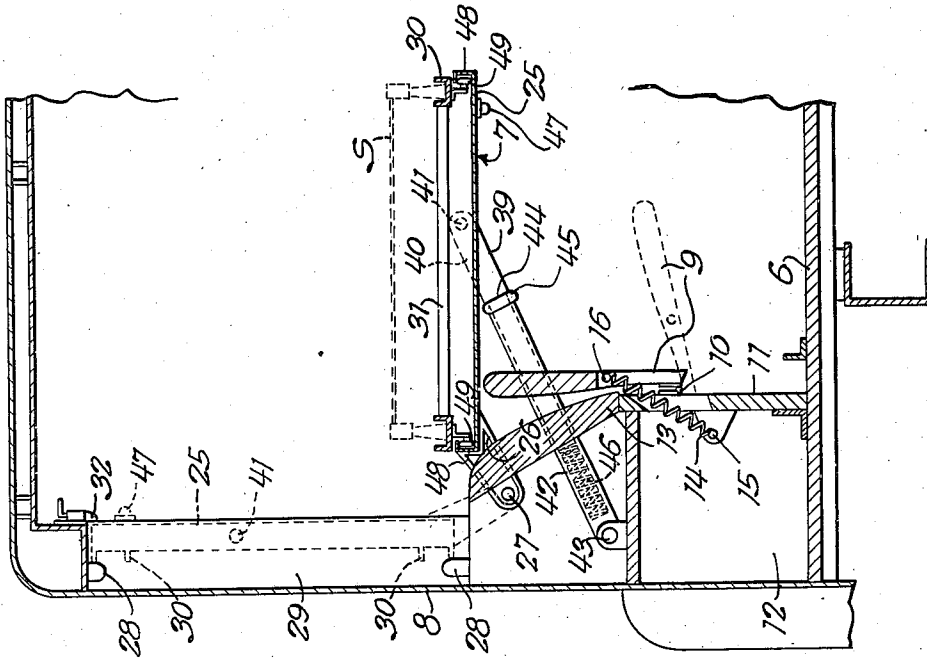
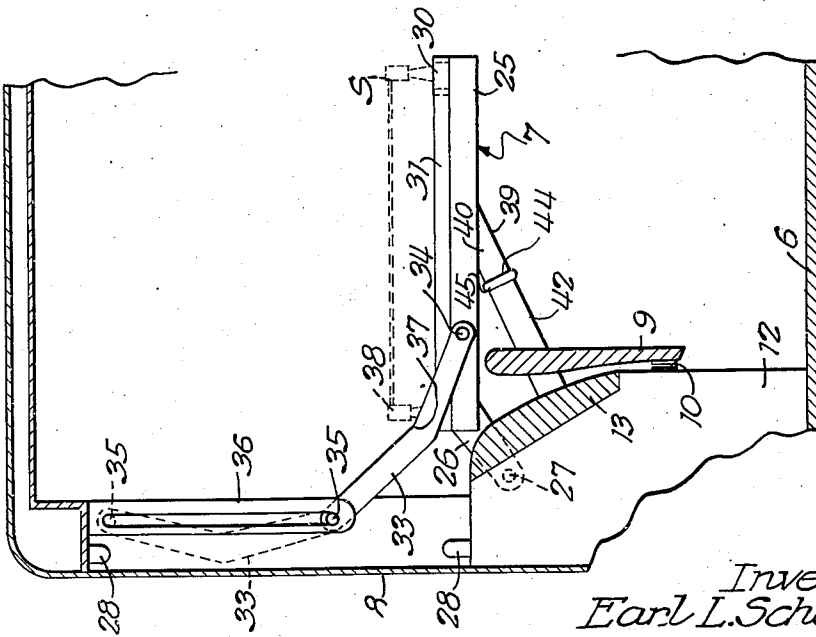


Fig. 2



Inventor
Earl L. Schofield
Andrew J. Winterman
att'y.

UNITED STATES PATENT OFFICE

2,456,024

FOLDABLE STRETCHER CARRIER FOR AMBULANCES

Earl L. Schofield, Rockford, Ill., assignor to E. L. Schofield, Incorporated, Rockford, Ill., a corporation of Delaware

Application March 5, 1945, Serial No. 581,003

6 Claims. (Cl. 296—19)

1

This invention relates to ambulances, and is particularly concerned with an improved foldable stretcher carrier designed for application to the side walls of the ambulance to unfold to a horizontal position at a predetermined elevation with respect to the floor, making it practical to carry four stretchers at a time, two on the foldable carriers and the other two on the floor therebeneath.

The principal object of my invention is to provide a foldable carrier which has roller track channels along the opposite sides thereof serving as guides for the supporting rollers on an extensible rack on which the stretcher is placed, said rack having means for releasably locking the same in retracted position releasably manually from the rear end of the carrier frame, and also means to limit the outward movement relative to the carrier frame and lock it releasably in the extended position, preferably utilizing the same manually releasable catch for this purpose.

Another object is to provide a carrier assembly of the kind mentioned that is hinged longitudinally at the lower end so as to fold up flush with the interior side wall of the ambulance, said assembly moving past a dead-center in folding, so that it tends to move outwardly toward the wall and there is less likelihood of its accidentally unfolding, and there is less strain upon releasable catch means to retain the assembly in folded position.

Still another object is to provide a stretcher carrier foldable in the manner described in which the downward movement is checked by telescoping members, one of which houses a compression spring arranged to be compressed by the other member to correctly counterbalance the weight of the carrier assembly as its center of gravity moves outwardly away from the side wall of the ambulance in the downward movement of the carrier toward operative position, the downward movement being positively limited but suitably cushioned so as to provide steady support for the carrier in its operative position. The counterbalancing means is so designed that it is practically flush with the interior side wall of the ambulance when the carrier assembly is in retracted position, and is high enough in relation to the floor so as not to interfere with placing a stretcher on the floor beneath the carrier when the carrier is lowered to its operative position.

The invention is illustrated in the accompanying drawings, in which—

Fig. 1 is a longitudinal section through an

2

ambulance equipped with the improved stretcher carrier made in accordance with my invention, illustrating how it enables convenient storage of stretchers at two levels, so that four stretchers can be carried at a time;

Fig. 2 is a cross-section in the plane of the line 2—2 of Fig. 1, showing the front carrier supporting arm;

Fig. 3 is a cross-section in the plane of the line 3—3 of Fig. 1, showing the telescoping rear support for the carrier assembly, and

Figs. 4 and 5 are enlarged sectional details in planes at right angles to one another, showing the roller track channels for the extensible rack and the releasable catch, Fig. 5 being taken on the line 5—5 of Fig. 4.

The same reference numerals are applied to corresponding parts throughout the views.

The ambulance herein disclosed is designed to accommodate as many as four standard Red Cross or Army type stretchers at a time, two being placed side by side on the floor 6 and two being placed on the novel carriers 7 provided in accordance with my invention, supported on and swingable outwardly from the opposite side walls 8. Such stretchers are indicated at S in Figs. 1, 2, and 3. The ambulance is also intended to be used in the evacuation of children and old people from places under bombardment, and for use in the transportation of less seriously injured persons in any emergency, and for that reason seats 9 are provided on both sides of the ambulance hinged, as indicated at 10, to the inner side walls 11 of the lower side storage compartments 12 to be swung down for use whenever they are required. Fixed backs 13 for these seats are provided directly above the storage compartments 12. Coiled tension springs 14, of which any suitable number may be provided in longitudinally spaced relation to each of the seats 9, have one end 15 attached to the wall 11 and the other end 16 attached to the seat in such relationship to the hinge axis provided by the hinges 10 that the seat will be held in raised position or lowered position under spring tension, a line drawn through the points 15 and 16 passing a dead-center position with respect to a line intersecting the points 10 and 15 in the movement of the seat from the one extreme position to the other, as should be clear from inspection of Fig. 3. A separate seat 17 is provided in front of the seats 9 behind the driver's seat 18 to accommodate attendants when the ambulance is carrying stretcher patients. Good ventilation is assured through the longitudinally extending

duct 19 which has an air intake 20 at its front end with suitable baffles 21 to slow down the air flow to the desired extent in the fast movement of the ambulance, the fresh air being delivered into the top of the ambulance from the duct 19 through openings 22. A damper 23 hinged at its upper end 24 is provided in the rear upper portion of the ambulance body for the exhausting of foul air. Suitable provision may be made for releasably securing the damper 23 in any desired open position, indicated in dotted lines, to provide the desired ventilation, or the damper may be light enough to open by itself under the air pressure thereon in the movement of the ambulance to act as a breather valve for continuous ventilation of the ambulance.

Each of the carriers 7 comprises a generally rectangular frame 25 having two or more arms 26 in longitudinally spaced relation projecting from the outer side thereof toward the adjacent side wall 8 of the ambulance body and suitably pivotally connected thereto, as indicated at 27 in Fig. 3, for swinging movement from the horizontal operative position shown in full lines in Figs. 2 and 3 to the raised or folded vertical position, indicated in dotted lines in Fig. 3, in which it lies substantially flush with the inside of the wall 8. Suitable anti-rattle bumpers 28 are provided in the top and bottom of the storage compartments 29 provided for the carriers 7 in the side walls 8, and these bumpers are engaged by the channel track portions 30 of the extensible racks 31 on the carrier frames 25 to reduce likelihood of noise when the carriers are folded to their retracted positions. Suitable spring latches 32 are provided, as indicated in Fig. 3, to lock the carriers releasably in the folded retracted position. In the lowered operative position, each of the carrier frames 25 is supported at the front end by a suspension arm 33 which is pivotally connected at its lower end, as at 34, to the carrier frame 25 at a predetermined distance radially from the pivotal axis 27, and has a slidable pivotal connection 35 at its other end in the longitudinally slotted attaching plate 36, which in turn is suitably secured to the side wall 8 in the front end of the storage compartment 29. This pin-and-slot connection at 35-36 permits the carrier 7 to fold up into the storage compartment 29, the arm 33 in this folding movement moving upwardly to the dotted position indicated in Fig. 2. The arm 33 has the bend 37 therein intermediate the ends thereof, so as to clear the bottom of the adjacent handle 38 of the stretcher S placed on the rack 31.

The rear end of each carrier frame 25 is supported from beneath by a telescoping form of prop arm 39, the inner piston-like member 40 of which is pivotally connected to the rear end of the frame, as at 41, at a predetermined radial distance from the pivotal axis 27, and the outer or cylinder member 42 of which is pivotally connected with respect to the side wall 8 of the ambulance at a point 43 substantially below the pivotal axis 27 on the top wall of the storage compartment 12, as clearly appears in Fig. 3. The upper end portion of the member 40 is enlarged with respect to the portion working in the cylinder 42, whereby to define an annular shoulder 44 for compression of a rubber bumper ring 45 between the members 40 and 42 at the lower limit of swinging movement of the carrier frame, thus reducing likelihood of any rattling in the movement of the ambulance. A coiled compression spring 46 is housed in the cylinder 42

and is subjected to a predetermined amount of compression in the lowering of the carrier frame 25 and is of a proper size to substantially counter-balance the weight of the carrier assembly 25-31 as the center of gravity of this mass moves outwardly away from the side wall 8 in the lowering of the assembly to the horizontal operative position. This makes for maximum safety for the operator. In the raising of the carrier assembly toward its folded position, it is obvious that the spring 46 will assist in this operation, the spring 46 expanding to some extent through part of this upward movement and being compressed to some extent through the rest of this upward movement, said spring being preloaded sufficiently in the installation of the assembly to exert some appreciable pressure on the inner end of the member 40 throughout the upward movement of the carrier assembly. In the upward movement, it is apparent that the spring 46 first expands, and at an intermediate position the pivots 41, 27 and 43 come into alignment on a dead-center where the spring is expanded to its greatest extent, and beyond that point the spring 46, being subject to a small amount of compression, offsets to some extent the fact that the center of gravity of the carrier assembly mass itself moves past a dead-center position with respect to the pivotal axis 27, causing the same to tend to swing outwardly under its own weight toward the side wall 8, as should be clear from inspection of Fig. 3, so that the carrier assembly is urged outwardly into tight contact with the bumpers 28 when the carrier assembly enters the storage compartment 29. That is to say, the catches 32 are not relied upon solely to hold the carrier assembly in folded retracted position, and if an unauthorized person were to open the latch 32 no harm would be done, because the carrier assembly would not immediately move outwardly. Suitable handles 47 are provided on the frames 25, as shown in Fig. 3, to enable pulling the frames outwardly and downwardly toward the unfolded operative position.

The frames 25 have roller guide track channels 48 provided thereon along opposite sides thereof in which rollers 49 mounted on the under side of the racks 31 are arranged to run for anti-friction rolling support of the racks 31. The racks are arranged to move rearwardly with respect to the carrier frames through the rear door opening 50, as indicated in Fig. 1, to facilitate the placing of the stretchers S thereon and the removal of said stretchers therefrom. A pair of notched strikers 51 and 52 are provided in longitudinally spaced relation on the side of one of the channels 30 of each of the racks 31 for engagement interchangeably with a spring-pressed catch 53 that is pivotally mounted, as at 54, on the rear cross-member 55 of the carrier frame 25, whereby to lock the rack 31 in either its fully extended or fully retracted position. The spring 56 tends normally to urge the catch 53 upwardly toward engagement in the notch 57 of either of the strikers 51 and 52, and there are cam surfaces 58 on these strikers on opposite sides of the notch 57 for engagement of the catch 53 automatically in the notches of these strikers when the rack is moved lengthwise relative to the carrier frame toward either of the two extreme positions. The projecting handle portion 59 on the free end of the catch is easily accessible for the operator from the rear of the ambulance when the rear door is opened, whereby to permit release of the catch when either of the racks 31

5

is to be extended for the loading or unloading of a stretcher. This handle 59 is also easily accessible from the rear of the ambulance in the extended position of the rack, so that the catch can be released to permit return movement of the rack after a stretcher has been loaded thereon or removed therefrom.

The present design of stretcher carrier is of advantage from the standpoint that the stretcher is kept in a horizontal position at all times and there is no jolting or jarring of the stretcher necessary in the loading or unloading operations. From the constructional standpoint, the mounting of the carriers on the side walls gives maximum interior head room, which is important where the vehicle is to be used also as a bus for carrying passengers, the seats 9 being provided for that purpose. The mounting of the stretcher carriers on the side walls also is of advantage in lowering the center of gravity of the vehicle as a whole, so that there is less inclination to side-sway or tipping in going around corners at high speed.

It is believed the foregoing description conveys a good understanding of the objects and advantages of my invention. The appended claims have been drawn to cover all legitimate modifications and adaptations.

I claim:

1. In an ambulance, comprising a body having substantially vertical side walls and a floor, a stretcher support comprising an elongated frame extending longitudinally with respect to the body for support of a stretcher, means for pivotally supporting said frame on one longitudinal edge portion thereof on the adjacent side wall for swinging movement upwardly from a substantially horizontal operative position to a substantially vertical retracted position alongside said wall, said pivoting means being so arranged with respect to said frame and side wall that the frame swings past a dead-center position in moving upwardly toward its retracted position, whereby said frame tends to gravitate toward said side wall when in retracted position, means for releasably securing said frame in retracted position, and means for supporting said frame in horizontal operative position, said means comprising telescoping members, one of which is pivoted to the frame radially outwardly from the pivotal axis of said frame on said side wall and the other of which is pivoted on said side wall below said pivotal axis, and a coiled compression spring means arranged to be compressed in the contracting movement of said telescoping members and arranged to expand throughout the extending movement of said telescoping members, whereby said spring means in at least the last portion of the lowering of the frame counterbalances the weight thereof and in at least the first portion of the raising of the frame assists such operation.

2. In an ambulance, comprising a body having substantially vertical side walls and a floor, a stretcher support comprising an elongated frame extending longitudinally with respect to the body for support of a stretcher, means for pivotally supporting said frame on one longitudinal edge portion thereof on the adjacent side wall for swinging movement upwardly from a substantially horizontal operative position to a substantially vertical retracted position alongside said wall, said pivoting means being so arranged with respect to said frame and side wall that the frame swings past a dead-center position in moving upwardly toward its retracted position,

6

whereby said frame tends to gravitate toward said side wall when in retracted position, means for releasably securing said frame in retracted position, and means for supporting said frame in horizontal operative position, said means comprising telescoping members, one of which is pivoted to the frame radially outwardly from the pivotal axis of said frame on said side wall and the other of which is pivoted on said side wall below said pivotal axis, a coiled compression spring means arranged to be compressed in the contracting movement of said telescoping members and arranged to expand throughout the extending movement of said telescoping members, whereby said spring means in at least the last portion of the lowering of the frame counterbalances the weight thereof and in at least the first portion of the raising of the frame assists such operation, and sound deadening means positively limiting the contracting movement of said telescoping members.

3. In an ambulance, comprising a body having substantially vertical side walls and a floor, a stretcher support comprising an elongated frame extending longitudinally with respect to the body for support of a stretcher, means for pivotally supporting said frame on one longitudinal edge portion thereof on the adjacent side wall for swinging movement upwardly from a substantially horizontal operative position to a substantially vertical retracted position alongside said wall, means for releasably securing said frame in retracted position, and means for supporting said frame in horizontal operative position, said means comprising telescoping members, one of which is pivoted to the frame radially outwardly from the pivotal axis of said frame on said side wall and the other of which is pivoted on said side wall below said pivotal axis, and a coiled compression spring means arranged to be compressed in the contracting movement of said telescoping members and arranged to expand throughout the extending movement of said telescoping members, whereby said spring means in at least the last portion of the lowering of the frame counterbalances the weight thereof and in at least the first portion of the raising of the frame assists such operation.

4. In an ambulance, comprising a body having substantially vertical side walls and a floor, a stretcher support comprising an elongated frame extending longitudinally with respect to the body for support of a stretcher, means for pivotally supporting said frame on one longitudinal edge portion thereof on the adjacent side wall for swinging movement upwardly from a substantially horizontal operative position to a substantially vertical retracted position alongside said wall, said pivoting means being so arranged with respect to said frame and side wall that the frame swings past a dead-center position in moving upwardly toward its retracted position, whereby said frame tends to gravitate toward said side wall when in retracted position, and means for supporting said frame in horizontal operative position, said means comprising telescoping members, one of which is pivoted to the frame radially outwardly from the pivotal axis of said frame on said side wall and the other of which is pivoted on said side wall below said pivotal axis, and a coiled compression spring means arranged to be compressed in the contracting movement of said telescoping members and arranged to expand throughout the extending movement of said telescoping members, whereby said

7

spring means in at least the last portion of the lowering of the frame counterbalances the weight thereof and in at least the first portion of the raising of the frame assists such operation.

5. In an ambulance, comprising a body having substantially vertical side walls and a floor, a stretcher support comprising an elongated frame extending longitudinally with respect to the body for support of a stretcher, means for pivotally supporting said frame on one longitudinal edge portion thereof on the adjacent side wall for swinging movement upwardly from a substantially horizontal operative position to a substantially vertical retracted position alongside said wall, said pivoting means being so arranged with respect to said frame and side wall that the frame swings past a dead-center position in moving upwardly toward its retracted position, whereby said frame tends to gravitate toward said side wall when in retracted position, and means for supporting said frame in horizontal operative position, said means comprising telescoping members, one of which is pivoted to the frame radially outwardly from the pivotal axis of said frame on said side wall and the other of which is pivoted on said side wall below said pivotal axis, a coiled compression spring means arranged to be compressed in the contracting movement of said telescoping members and arranged to expand throughout the extending movement of said telescoping members, whereby said spring means in at least the last portion of the lowering of the frame counterbalances the weight thereof and in at least the first portion of the raising of the frame assists such operation, and sound deadening means positively limiting the contracting movement of said telescoping members.

6. In an ambulance, comprising a body having substantially vertical side walls and a floor, a stretcher support comprising an elongated frame extending longitudinally with respect to the body for support of a stretcher, means for pivotally supporting said frame on one longitudinal edge portion thereof on the adjacent side wall for swinging movement upwardly from a substantially horizontal operative position to a sub-

8

stantially vertical retracted position alongside said wall, means for releasably securing said frame in retracted position, and means for supporting said frame in horizontal operative position, said means comprising telescoping members, one of which is pivoted to the frame radially outwardly from the pivotal axis of said frame on said side wall and the other of which is pivoted on said side wall below said pivotal axis, a coiled compression spring means arranged to be compressed in the contracting movement of said telescoping members and arranged to expand throughout the extending movement of said telescoping members, whereby said spring means in at least the last portion of the lowering of the frame counterbalances the weight thereof and in at least the first portion of the raising of the frame assists such operation, and sound deadening means positively limiting the contracting movement of said telescoping members.

EARL L. SCHOFIELD.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
298,951	Doerr	May 20, 1884
777,284	Fuller	Dec. 13, 1904
797,114	Hill	Aug. 15, 1905
1,178,360	Tudor	Apr. 4, 1916
1,237,647	Hunt	Aug. 21, 1917
1,394,036	Main	Oct. 18, 1921
1,755,997	Merrill et al.	Apr. 22, 1930
1,999,056	Patton	Apr. 23, 1935
2,352,351	Thornhill	June 27, 1944

FOREIGN PATENTS

Number	Country	Date
14,378	Great Britain	Sept. 12, 1890
278,830	Great Britain	Oct. 20, 1927
299,427	Italy	Aug. 2, 1932
404,087	Great Britain	Jan. 11, 1934
512,032	Great Britain	Aug. 28, 1939
681,183	Germany	Sept. 16, 1939