

March 17, 1942.

J. STOLLENWERK

2,276,998

COLLAPSIBLE TRESTDLE FOR STRETCHERS

Filed Feb. 9, 1938

2 Sheets-Sheet 1

FIG. 1.

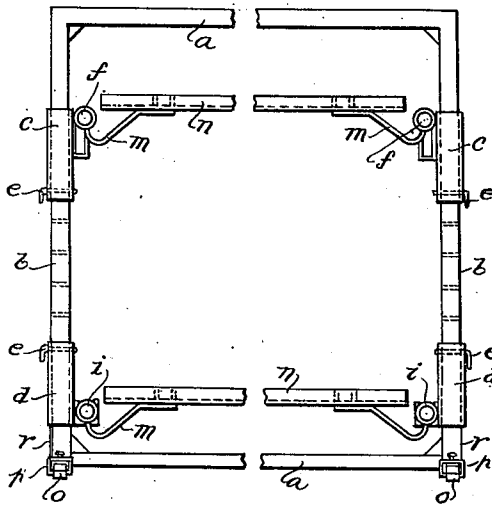


FIG. 2.

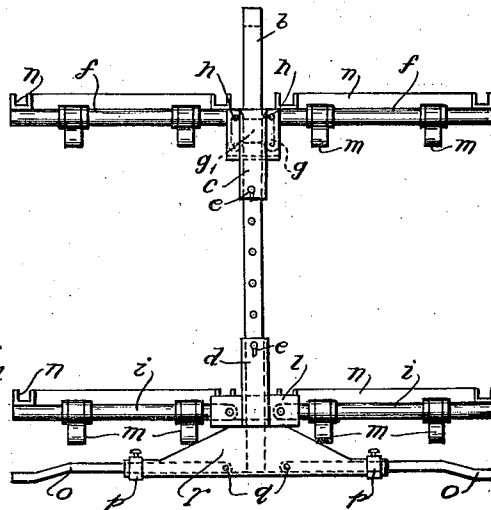


FIG. 3.

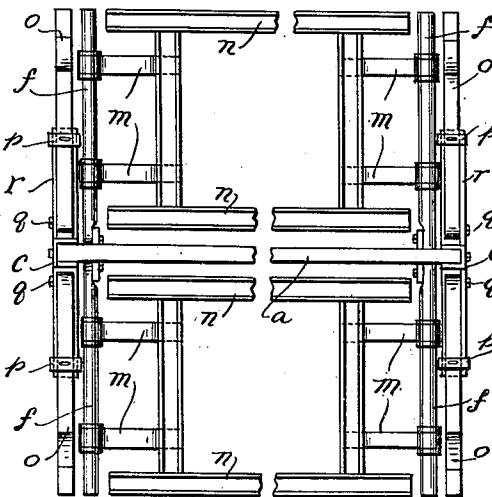


FIG. 4.

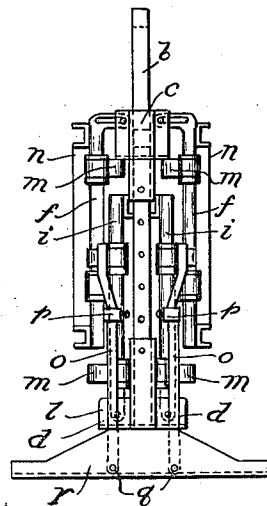


FIG. 5.

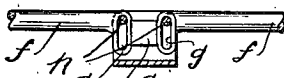


FIG. 7.

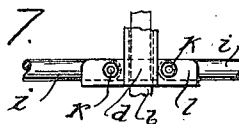


FIG. 6.

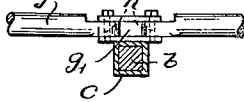
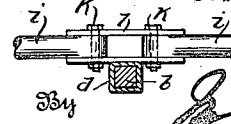


FIG. 8.



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## COLLAPSIBLE TRESTLE FOR STRETCHERS

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*Fig. 10.*

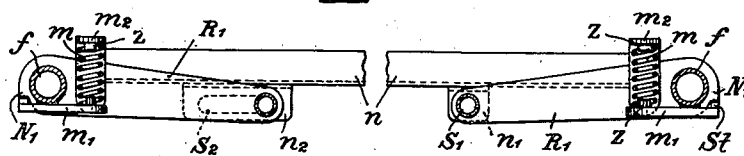


Fig. 9.

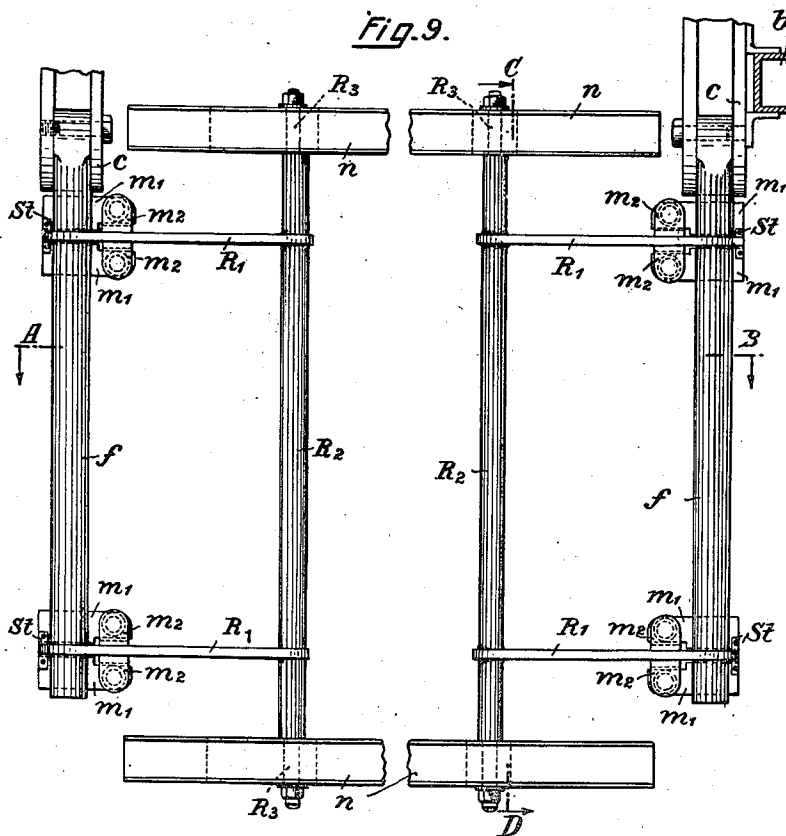
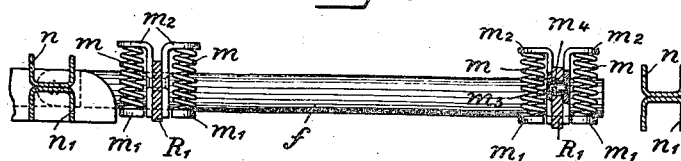


Fig.11.



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$R_1 m_1 n_1$   
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## UNITED STATES PATENT OFFICE

2,276,998

## COLLAPSIBLE TRESTLE FOR STRETCHERS

Johann Stollenwerk, Nowawes, near Potsdam,  
GermanyApplication February 9, 1938, Serial No. 189,700  
In Germany February 16, 1937

3 Claims. (Cl. 5—210)

The subject matter of the present invention is a collapsible trestle for stretchers, which is intended to be installed upon vehicles of every description. According to this invention the trestle is of such design that as long as it is out of use, it can be folded up in such a manner that it will only require very little space. If patients are to be conveyed, the trestle can most conveniently be opened and placed in position so as to be ready for use, and so that several stretchers for patients can be accommodated in such a manner that the space at disposal is used highly economically. Care has been taken by the arrangement of a particularly appropriate design of supporting spring on which those parts are suspended, on to which the stretchers are placed when used, so that no shocks of any intensity are transmitted either to the stretcher or to the patient, without, however, a possibility existing of the stretcher adopting undesired vibrations.

The invention is primarily characterized by the feature that the trestle is suitable to be installed upon vehicles of whatsoever description, for the purpose of placing the stretchers upon it. It is provided with rails which are attached to sliding sleeves so as to be foldable and unfoldable, said sleeves sliding along vertical rods in such a manner that they can be arranged at the desired respective level by means of suitable devices, for instance cotters or the like. The framework can in this manner be adapted so as to be used for four or even more stretchers, two stretchers each then being placed on either side of the vertical rods of the trestle.

One suitable design of construction of this trestle is shown in the illustrations.

Figure 1 is a side elevation of one form of the improved trestle.

Figure 2 is an end view of the same, the parts being shown in operative positions.

Figure 3 is a plan view of the same with the parts in operative positions.

Figure 4 is an end view of the same with the parts in folded positions.

Figure 5 is an elevation, partly in section, of a detail showing the means for supporting the upper bars in operative positions.

Figure 6 is a similar view shown in plan and partly in section.

Figure 7 is a detail view showing the means for supporting the lower bars in operative positions.

Figure 8 is a plan, partly in section, of the same.

Figure 9 is a broken plan view of a modified form.

Figure 10 is a sectional view on the line A—B of Figure 9.

Figure 11 is a sectional view on the line C—D of Figure 9.

The trestle consists of longitudinal struts *a* and transversal struts *b*, the cross section of which can either be rectangular, circular, or of any other suitable shape. The base is on either side supported by a central pedestal *r* to which the struts *a* and *b* are fixed, as is disclosed by Figure 1. The pedestals *r* are provided with folding rods *o* which are pivotably assembled so as to pivot around pins *q*. The rods *o*, when unfolded downwardly, are held in their position by collars *p* so as to impart a higher degree of stability to the trestle.

Sliding sleeves *c* and *d* are provided on the struts *b* and can be fixed at any desired height by means of cotters *e* or other suitable devices. As can be seen in Figure 5, bars *f* having lateral extensions formed with slots *g*, are pivotally attached to bolts *h*, as far as the upper sliding sleeves *c* are concerned, in such a way that, when opened, they will rest against the stop surfaces or abutments *g*<sub>1</sub>. The lower or inferior bars *i* are pivotally attached to the lower sliding sleeves *d* by means of bolts *k* which bars *i* when in operative position rest against shoes *l*. Rails *n* are pivotally fixed to both pair of bars, *f* and *i* respectively, by means of suitable elastic members *m*.

The stretchers for the patients can be placed on said rails *n* and fixed on to them in a manner appropriate to the purpose. The dimensions of the fixing means are preferably to be selected in such a way that both types of stretchers customarily used at present can be placed and fixed on the rails.

The trestle according to the present invention is designed so as to be collapsible as long as not used, for the purpose of saving space, as is disclosed by Figure 4. The particular design of construction of the bars *i* and *f*, and also of the sliding sleeves *c* and *d*, and furthermore the manner in which the bars are assembled to the latter so as to be able to pivot on them, can be seen from Figures 5 to 8. By the manner in which the upper bars *f* are placed on their bearing members in slot holes like connecting links and pivotally fixed to the upper sliding sleeve, it is apparent that the lower bars *i* and rails *n* carried thereby when turned up to their upper position, will assume a position with the rails *n* substantially in contact, whereas the upper bars *f* with the rails *n* carried thereby will

then be lifted up, as permitted by the slots *g* in such a way that thereby it is rendered possible to turn them down, whereby they will be placed laterally alongside the lower bars *i*. If the rods *o* pivotally attached to the pedestals *r*, which when used, provide the required stability, have previously also been turned in an upward direction so as to pivot around on pivot *q* after removal of the collars *p*, the entire structure, as long as not used, will occupy very little space. In case of requirement for use the rods *o* are turned to their lowest position, in which they are secured by means of the collars *p*, the bars *f* are turned upwardly, whereas the bars *i* are turned in a downward direction, whereupon the trestle will thus be ready to take up 4 stretchers for patients after the trestle has been screwed on to the floor of the vehicle, the space at disposal thereby being used in a most economical manner.

The scope of this invention is not restricted to the means used in the case of the model of construction. The trestle can naturally also be adapted so as to accommodate more than two pairs of stretchers. For the spring-suspension of the rails on which the stretchers are to be placed, torsional springs or ribbon springs coiled as spiral springs, and the like, can also be used in the place of those springs shown in the illustrations. It is particularly appropriate to the purpose to construct the spring-supporting design in such a way as is disclosed by illustrations 9 to 11. The frame formed by the supports *R*<sub>1</sub> and the carriers *R*<sub>2</sub>, is pivotally attached to the bars *f* which, for instance, can be made of metal tubes. Both ends of the carriers *R*<sub>2</sub> are shaped so as to form pins *R*<sub>3</sub> on which the rails *n* are placed, this being preferably done in such a manner that U-shaped iron members *n*<sub>1</sub> and *n*<sub>2</sub> are at suitable distances fixed to the lower surfaces of the channel irons *n*, one of which members, namely, *n*<sub>1</sub>, is provided with a circular perforation *S*<sub>1</sub>, the other, i. e., *n*<sub>2</sub>, with a slot-shaped perforation *S*<sub>2</sub>. The U-shaped rails *n* are, by means of these circular and longitudinal perforations, *S*<sub>1</sub> and *S*<sub>2</sub> respectively, slid on to the pins *R*<sub>3</sub> of the carriers *R*<sub>2</sub>. According to this invention the spring suspension is realised preferably by means of helical springs *m*, and more exactly in such a way that resting surfaces *m*<sub>1</sub> are arranged along the bars *f*, whereas corresponding resting surfaces *m*<sub>2</sub> are provided on the supports *R*<sub>1</sub> of the frame. The supports *R*<sub>1</sub> are most preferably made of flat bar-irons. The resting surfaces on them can then in a very simple manner be formed out of flat irons *m*<sub>2</sub> which are either fixed to the supports *R*<sub>1</sub> by riveting them on, or in another suitable manner, these flat irons near their upper end being provided with a rectangular bend. In the example illustrated by the drawings a rivet *m*<sub>3</sub> and a sleeve *m*<sub>4</sub> defining the correct distance, are used in such a way that a certain play is allowed between *R*<sub>1</sub> and *m*<sub>2</sub>, and in such a manner that the supporting surface *m*<sub>2</sub> will continue to maintain its perpendicular position as compared with the direction of pressure in every case of actual spring action. The helical springs *m* are then caught between the surfaces *m*<sub>1</sub> and *m*<sub>2</sub> by devices similar to clamping levers. In this manner it is rendered possible to place the point where the supports *R*<sub>1</sub> contact the springs *m*, in very close vicinity of the turning point, and also of the turning axis of the supports *R*<sub>1</sub>

and of the entire frame *R*<sub>1</sub>, *R*<sub>2</sub>, respectively, so that as a consequence the leverage of the load acting upon the carriers *R*<sub>2</sub>, and affecting the supporting springs *m*, will be many times greater than the leverage of supports *R*<sub>1</sub> upon the springs *m*. The resting surfaces *m*<sub>1</sub> and *m*<sub>2</sub> are preferably provided with small pins *z*, see Figure 10—onto which the helical springs *m* are pushed, to which latter these pins afford the required support. This method of fixing the helical springs offers the advantage that the latter can very easily be replaced by new ones. Merely a lifting of the parts *R*<sub>1</sub>, *R*<sub>2</sub> is required in order to do this. With the aid of a suitable tool, for instance a sufficiently strong piece of wire or of a flat iron, the parts can very easily be held in the position necessary for exchanging the springs, the tool for this purpose being inserted between the support *R*<sub>1</sub> and, for instance, the resting surface *m*<sub>1</sub>.

In order to prevent the springs *m* from dropping away upon the rails being lifted, a detachable limiting stop can be provided, by which the upward movement of the supports *R*<sub>1</sub> is limited in such a way that the springs *m* are not yet released by the pin *z*. This limiting stop consists preferably of a rib *St* which can be unscrewed and overbridges the distance between the plates or resting surfaces *m*<sub>1</sub>, and of a lug *N*<sub>1</sub> provided on the rear surface of the supports *R*<sub>1</sub>, which lug upon the rail *n* when the frame is lifted, will rest against the ribs *St* and thus limit the motion in upward direction. If it is intended to exchange the springs *m*, the ribs *St* are unscrewed, whereupon the supports *R*<sub>1</sub> can be lifted so far that the springs *m* will be released by the pins *z*.

It is evident that a stretcher with a patient, when placed upon the rails *n*, can merely adopt smooth upward and downward movements in case of any shock occurring, and also as a consequence of other forces displaying their influence upon the car, and that, on the other hand, every kind of pitching or tilting is out of the question, because the frames formed of the parts *R*<sub>1</sub>, *R*<sub>2</sub> can only as one single unit pivot around the bars *f*, wherefore rails *n* will carry out all movements jointly, and will permanently keep their positions parallel to one another and at one and the same level.

What I claim is:—

1. A stretcher frame including a base, uprights carried by the base, bars pivotally connected to the uprights for upward swinging, means for limiting the downward swinging of the bars, supports swingingly connected to and extending laterally of each bar in spaced relation, carriers connected to and supported by the ends of the supports remote from the bars, rails carried by the free ends of the carriers beyond the bars, and resilient supporting means for the supports, said supporting means being arranged adjacent the bars and forming the sole positioning means for the supports and their connected parts.

2. A construction as defined in claim 1 wherein each resilient means includes a pair of springs arranged on opposite sides of and supporting the particular support.

3. A construction as defined in claim 1 wherein each resilient means includes a pair of springs, a plate resting upon the upper end of each spring and extending downwardly between the springs, and a connection between said plates and the particular support.

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