Oct. 28, 1969 O. HANNABERG 3,474,473

ADJUSTABLE HAND RAIL ATTACHMENT FOR A BED AND MATTRESS

Filed Nov. 9, 1967 2 Sheets-Sheet 1

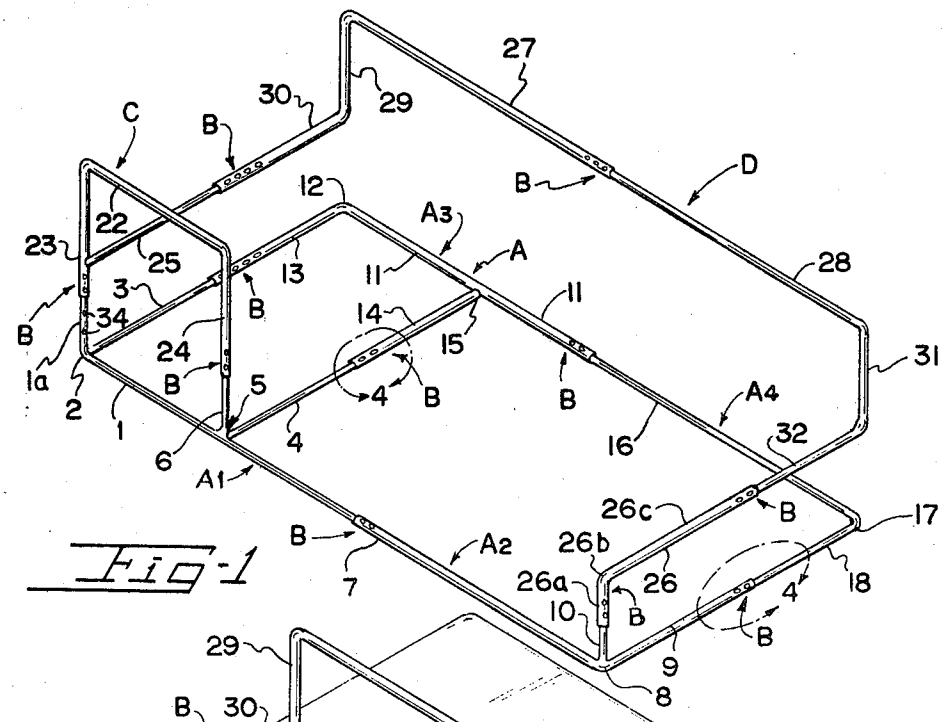



Fig-1

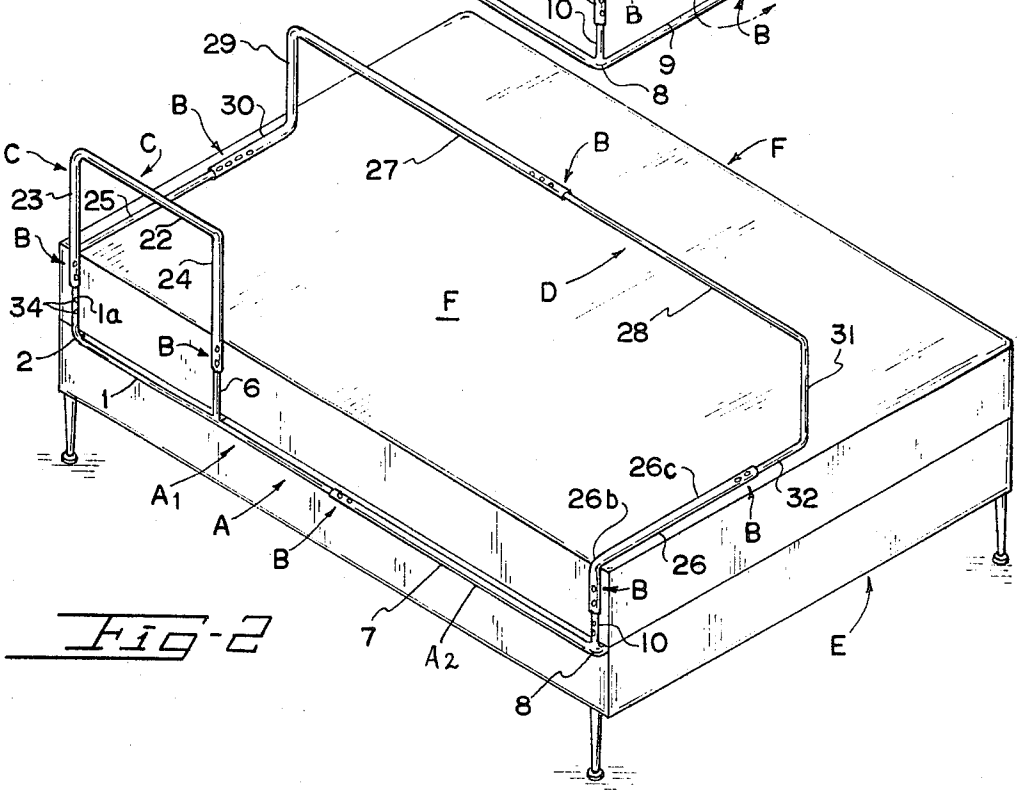



Fig-2

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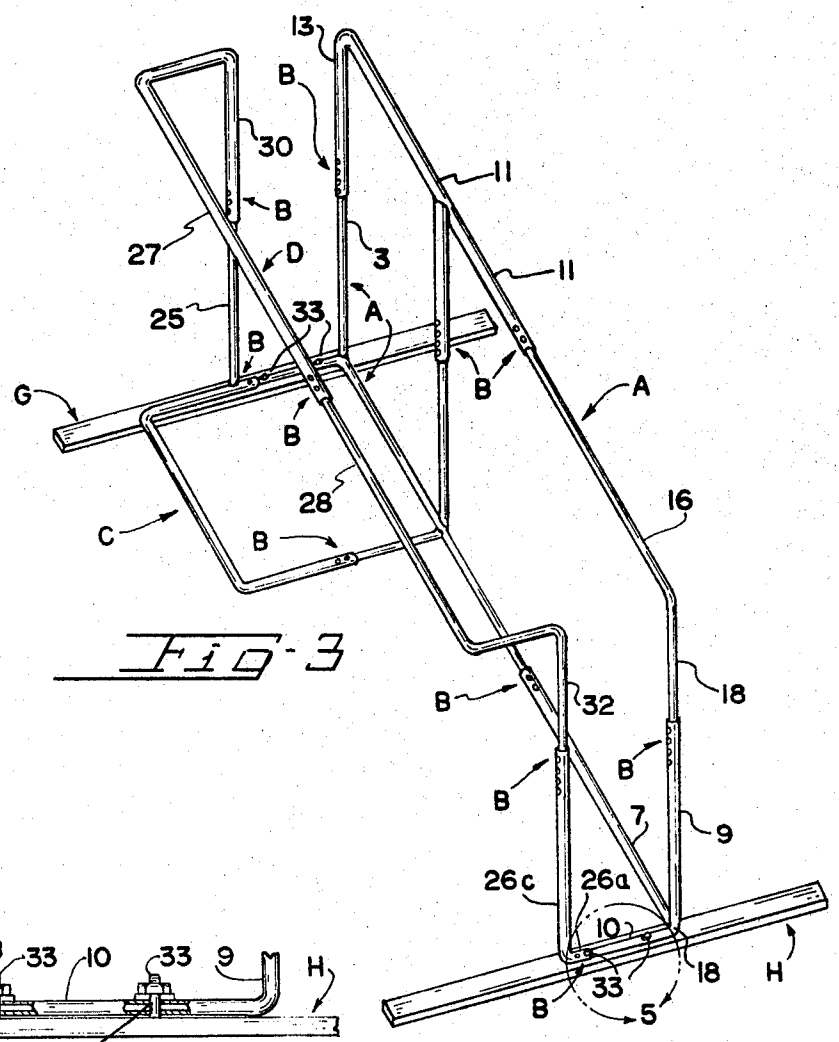



Fig-3

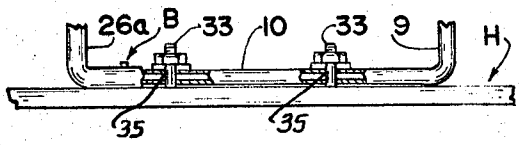



Fig-5

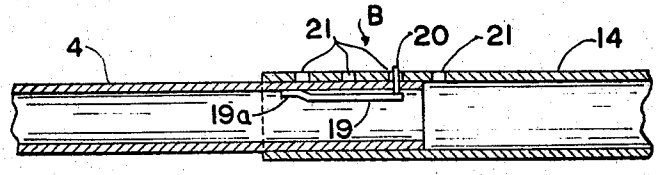



Fig-4

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3,474,473

# ADJUSTABLE HAND RAIL ATTACHMENT FOR A BED AND MATTRESS

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U.S. Cl. 5—331 5 Claims

## ABSTRACT OF THE DISCLOSURE

A hand rail attachment for a bed having a portion adapted to be placed under a mattress and having two hand rails, one of them extending part way along the side of the bed and projecting above the mattress, the other extending along the center of the bed and overlying the top of the mattress if it is a double size one. The various parts of the attachment are extensible so as to fit beds and mattresses of different sizes. The attachment when removed from the bed and mattress can be used to aid a person in exercising his legs while holding onto the device with his hands.

## BACKGROUND OF THE INVENTION

### Field of the invention

When a persons legs are paralyzed he needs help in being transferred from a wheel chair to a bed. If the bed is provided with side hand rails, the person may pull himself from the chair onto the bed by grasping the rails. The beds in hospitals are provided with side rails, but the domestic bed that is used at home is not so provided. I have invented a hand rail attachment that can be mounted on a bed and held in place by the mattress. The device can be used on double beds and then one of the rails will extend along the mattress center.

### Description of the prior art

The prior art discloses bed attachments in which portions of the devices extend under the mattresses such as the Patents Nos. 1,915,774, 2,722,693, and 2,904,799. The bed rail disclosed in Patent No. 3,290,701 shows the rail as being extensible. No patent sets forth an extensible hand rail attachment for a bed and mattress which can be applied to either a single or a double bed mattress. When the device is applied to a double mattress, one of the rails will extend along the middle of the mattress and be spaced thereabove.

## SUMMARY OF THE INVENTION

An object of my invention is to provide an adjustable hand rail attachment for a bed and mattress that has a portion adapted to underlie a mattress and to support hand rails that extend above the top of the mattress. If the mattress is of a double size or larger, one of the hand rails will extend along the center of the mattress and be positioned thereabove.

A further object of my invention is to provide a device of the type described that can be removed from the bed and mattress and placed on the floor in a certain position so as to permit its use in aiding a person having paralyzed legs to grasp the sides of the device with his hands and exercise his legs by trying to walk.

The device is durable and efficient for the purposes intended and is inexpensive to manufacture.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is an isometric view of the device.

FIGURE 2 is a similar view, but shows the device mounted on a double bed and receiving about one-half of a doubled bed size mattress.



FIGURE 3 is an isometric view of the device when used as a hand support for use by a cripple who wishes to steady himself while exercising his legs.

FIGURE 4 is a detailed and enlarged sectional view of a portion of the device in FIGURE 1 that is enclosed in the dot-dash oval portion designated by the numeral 4.

FIGURE 5 is a detailed and enlarged view, partly in section of a portion of the device in FIGURE 3 that is enclosed in the dot-dash oval portion designated by the numeral 5.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

In carrying out my invention I provide an adjustable hand rail attachment for a bed and mattress that is made principally of tubing, certain tubing portions being welded together and bent into the desired shapes and other tubing portions having telescopic connections with the first tubing portions to permit adjustments to be made in the device for varying its size so as to fit a certain bed and mattress. Referring to FIGURES 1, 2 and 4, I disclose a base frame indicated generally at A. This base frame is formed from four frame sections shown at A1, A2, A3 and A4, in FIGURE 1. These frame sections are made up from tubings of two different diameters, the smaller diameter tubing having ends designed to slidably receive tubing of a larger diameter. Adjustable securing means, hereinafter described, is used for connecting these four sections together to form the base frame A of the desired size. I will now describe the four sections and show how they are interconnected.

The frame section A1 is constructed of the smaller diameter tubing while the frame section A3 is constructed of the larger diameter tubing. This could be reversed without departing from the spirit and scope of the invention. The frame section A1, see FIGURE 1, has a longitudinally extending small diameter tubing **1** with an upturned portion **1***a* forming a rounded corner at **2**. Two transversely extending small diameter tubings **3** and **4** have their ends welded to the tubing **1** and project therefrom. The tubing **3** has its end welded to the corner **2** and the tubing **4** has its end welded to the tubing **1** at **5** which is spaced from the corner **2**. A vertically extending tubing **6** of the small diameter has its lower end welded to the tubing **1** at the juncture of the tubing **4** with the tubing **1**.

The section frame A2, for the base frame A, see FIGURE 1, is made from the larger diameter tubing and includes a longitudinally extending tubular member **7** that slidably receives the end of the tubing **1**. The tubular member **7** is bent at right angles to form a rounded corner **8** and a lateral extension **9**. A vertical smaller diameter tubing **10** has its lower end welded to the rounded corner **8**.

The section frame A3 for the base frame A, see FIGURE 1, is made from the larger tubing and it has a longitudinally extending tubular member **11** with a rounded corner at **12** and a laterally projecting portion **13** that extends from this corner. The open end of the laterally projecting or transverse portion **13** slidably receives the end of the transversely extending smaller diameter tubing **3**. Another tranversely extending larger diameter tubing **14** parallels the tubing **13** and is spaced the same distance from this tubing as the transverse tube **4** is spaced from the transverse tube **3**. The tube **14** is welded to the tube **11** at the juncture **15** so as to extend at right angles to the tube **11**. The open end of the transversely extending tubing **14** slidably receives the end of the smaller diameter tubing **4**.

The fourth section frame A4 is made of the smaller tubing and is L-shaped to form the lower right hand corner of the base frame A, see FIGURE 1. The tube form-

ing the section frame A4 has a longitudinally extending portion **16**, a rounded corner **17** and a transversely extending portion **18**. The open end of the smaller diameter longitudinal tube **16** is slidably received in the open end of the larger diameter tube **11** while the open end of the smaller diameter transversely extending tube **18** is slidably received in the open end of the larger diameter and transversely extending tube **9**.

The four frame sections A1 to A4 inclusive of the base frame A are adjustably secured together to vary the width and length of the frame to adapt it to the bed and mattress on which it is used. Any adjustable locking means may be used and I have illustrated one type in detail in FIGURE 4 which is an enlargement of the dot-dash oval "4" indicated in FIGURE 1. The end of the smaller diameter tube **4** is shown slidably received in the adjacent end of the larger diameter tube **14**. A leaf spring **19** is disposed in the smaller diameter tube **4** and has one end **19***a* welded to the tube. The free end of the leaf spring carries a detent or button **20** that projects through an opening in the tube **4** and is selectively receivable in any one of a row of openings **21** provided in the larger diameter tube **14**. The button **20** when received in any one of the openings **21** acts as a lock for preventing sliding movement between the tubes **4** and **14**. It is a simple matter to adjust the two tubes **4** and **14** with respect to each other by first manually depressing the button **20** to free it from the opening **21** in which it had been received and then sliding the two tubes **4** and **14** with respect to each other to either increase or decrease their collective length. I provide similar adjustable locking means between the tubes **3** and **13**, the tubes **9** and **18**, the tubes **1** and **7**, and the tubes **11** and **16**, see FIGURE 1. The adjustable locking means will be generally indicated as B in all of these places.

The base frame A adjustably supports two hand rails, a shorter length one being indicated generally at C, in FIGURES 1 and 2, and a longer length one being indicated generally at D. The shorter length hand rail C is formed from the larger diameter tubing that is in the shape of an inverted U. The hand rail C is disposed at the left hand side of the base frame A and has a longitudinally extending hand grip portion **22** and two depending parallel portions **23** and **24**. The lower open end of the large diameter tubular portion **23** slidably receives upturned smaller diameter end **1***a* of the tube **1** while the lower open end of the larger diameter tubular portion **24** slidably receives the smaller diameter vertical tube **6**. The hand rail C can be adjusted as to the distance between the hand grip portion **22** and the tube **1** of the base frame A and then secured in adjusted position by the locking means B, shown in detail in FIGURE 4.

The tube **23** of the hand rail C has an end of a smaller diameter tube **25**, welded thereto so that the tube **25** will extend at right angles to a plane that is formed by the three tubular portions **22**, **23** and **24** of the hand rail C.

The longer length hand rail D, has its ends supported by the transverse tube **25** and an L-shaped tube **26**, see FIGURES 1 and 2. The tube **26** is of the larger diameter and it has a vertically extending portion **26***a* that slides over the smaller diameter vertically extending tube **10**. A rounded corner **26***b* in the tube **26**, lies between the vertical portion **26***a* of the tube and a horizontal portion **26***c*, the latter portion paralleling the tube **25** and being positioned the same height above the tube **9** of the base frame A, as the tube **25** is positioned above the tube **3**. Another locking means B, permits adjustment of the tube **26***a* on the tube **10**. The long hand rail D has an elongated tubular portion formed from a larger diameter tubular section **27** that has an open end for slidably receiving the adjacent end of a smaller diameter tubular section **28**, see FIGURES 1 and 2. A locking means B secures the sections **27** and **28** together so that their effective length is the same as the effective length formed by the interconnecting tubes **11** and **16** of the base frame A.

FIGURES 1 and 2 show the larger diameter tubular section **27** of the longer hand rail D, as having a downwardly extending portion **29** and a transversely extending portion **30**, the open end of the portion **29** slidably receiving the adjacent end of the transverse tube **25**. A locking means B secures the portion **30** to the tube **25** in adjusted position so that the effective length of the combined tubular portions **25** and **30** is equal to the effective length of the two interconnected tubular portions **3** and **13**. Also the smaller diameter tubular section **28** of the longer hand rail D, has a downwardly extending portion **31** and a transversely extending portion **32**, the open end thereof being slidably received in the adjacent end of the larger diameter horizontal portion **26***c*. A locking means B, secures the two tubular portions **26***c* and **32** together in adjusted position and the effective length of these two portions should equal the effective length of the two tubular portions **9** and **18** of the base frame A.

FIGURE 2 shows my adjustable hand rail attachment applied to a double bed indicated generally at E, and a double mattress F. The shorter hand rail C has its tubular leg portions **23** and **24** adjusted on the smaller diameter vertical tubes **1***a* and **6** so that the transversely extending tube **25** that is carried by the leg **23**, will overlie the top of the mattress F, at the head of the bed. Also the L-shaped tube **26** has its tubular leg portion **26***a* adjusted on the smaller diameter vertical tube **10** so that the horizontal portion **26***c* of the L-shaped tube will overlie the top of the double mattress F at the foot of the bed. The base frame A is adjusted for proper size and is then placed on top of the double bed E and under the double mattress F. The mattress acts as a weight for holding the base frame A in place.

The bed sheets and blankets, not shown, are applied to the mattress F, before the device is placed in position. The tubular portions **25** and **30** will extend transversely across the bed from one side thereof up to the middle of the bed. A pillow, not shown, normally covers these tubular portions **25** and **30**. The other tubular portions **26***c* and **32** extend transversely across the foot of the mattress from the one side thereof up to the mattress midpoint and will overlie the bed sheets and blankets, not shown. This will position the longer length hand rail D at the middle of the mattress and the vertical tubular portions **29** and **31** will dispose the hand grips sections **27** and **28** at the desired height above the top of the mattress. It is possible for the crippled person to occupy the left hand portion of the double bed and make use of the two hand rails C and D for moving his body. The other half of the double bed can also be occupied by another person and the device will not interfere with his use of the bed.

In FIGURES 3 and 5, I show my device removed from the bed and placed on the floor in a different position so that it can be used by a cripple in exercising his legs while holding on to the device with his hands. The shorter length hand rail C is placed on the floor and this will place the tubular portions **10** and **26***a* also on the ground. The longer length hand rail D, now is positioned at the top of the device and it parallels the tubular portions **11** and **16** that now form the top side of the upened base frame A which lies in a vertical plane rather than in the horizontal plane shown in FIGURES 1 and 2. The device is stabilized and prevented from tipping over by two foot boards G and H, shown in FIGURES 3 and 5. Each base board carries two spaced apart studs **33** that extend through similarly spaced apart openings **34** in the tubular portion **1***a*, seee FIGURES 1 and 2, and spaced apart openings **35** in the tubular part **10**, see FIGURES 1, 2 and 5. Nuts are mounted on the threaded portions of the studs **33** and temporarily secure the foot boards G and H to the device.

FIGURE 3 shows the ends of the foot board G projecting beyond the hand rail C and the base frame A, while the ends of the foot board H project beyond the tubular portions **26***a* and **10**. These foot boards will steady the device and prevent it from tipping over when in use. The

person using the device can enter it through a passage provided by the space between the tubular portions **26***c* and **32** and the tubular portions **9** and **18**, or through a passage provided by the space between the tubular portions **25** and **30** and the tubular portions **3** and **13**. The long hand rail D composed of the tubular portions **27** and **28** cooperates with the opposite parallel tubular portions **11** and **16** to form a walk-way from the patient who may be advanced in age or be partially paralyzed. The other parts of the device illustrated in FIGURE 3 have already been described and need no further detailed description. The hand rail D, and the parallel tubular portions **11** and **16** may be raised or lowered.

The device when used in the manner shown in FIGURE 2, can enclose the mattress F or could be enlarged to enclose the mattress and box springs, not shown. The rail composed of the tubular portions **26***c* and **32** can keep the bed clothes in proper position.

I claim:

**1.** In combination:

(a) a base frame adapted to be disposed beneath a mattress and having two elongated sides;

(b) a shorter length hand rail extending above the mattress top and being connected to one side of said base frame; and

(c) a longer length hand rail extending above the mattress top and having supporting members overlying the mattress, one of said supporting members being connected to said shorter length hand rail and the other supporting member being bent to extend from the top of the mattress and having its end connected to said base frame.

**2.** The combination as set forth in claim **1**, and in which

(a) said base frame is adjustable to vary its length and width; and

(b) said longer hand rail being adjustable as to length.

**3.** The combination as set forth in claim **2**, and in which

(a) said supporting members for said longer length hand rail are adjustable as to length so as to adjust the distance between the shorter length hand rail and the longer length hand rail.



**4.** The combination as set forth in claim **1**, and in which

(a) said shorter length hand rail is adjustable as to height; whereby the supporting member that is connected to it can be adjusted with respect to said base frame to accommodate the thickness of the mattress; and

(b) the bent portion of said other supporting member can be adjusted as to length so as to dispose the mattress overlying portion of this member the required distance above said base frame to accommodate the thickness of the mattress.

**5.** The combination as set forth in claim **1**, and in which

(a) said base frame has telescoping portions for adjusting the width and length of the frame;

(b) means for securing the telescoping portions in adjusted position;

(c) said shorter length hand rail having parallel depending portions with a telescopic connection with upright portions extending from said base frame to permit adjustment of said shorter hand rail;

(d) means for securing the telescopic connection of said shorter hand rail in adjusted position;

(e) said longer length hand rail having telescopic portions for permitting it to be adjusted as to length;

(f) said supporting members for said longer length hand rail having telescopic portions for permitting said longer length hand rail to be moved toward or away from said shorter length hand rail; and

(g) means for securing the telescopic portions of said supporting members in adjusted position.

**References Cited**

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U.S. Cl. X.R.

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