

Nov. 27, 1928.

T. B. SMITH ET AL

1,693,320

BED ATTACHMENT

Filed May 9, 1927

2 Sheets-Sheet 1

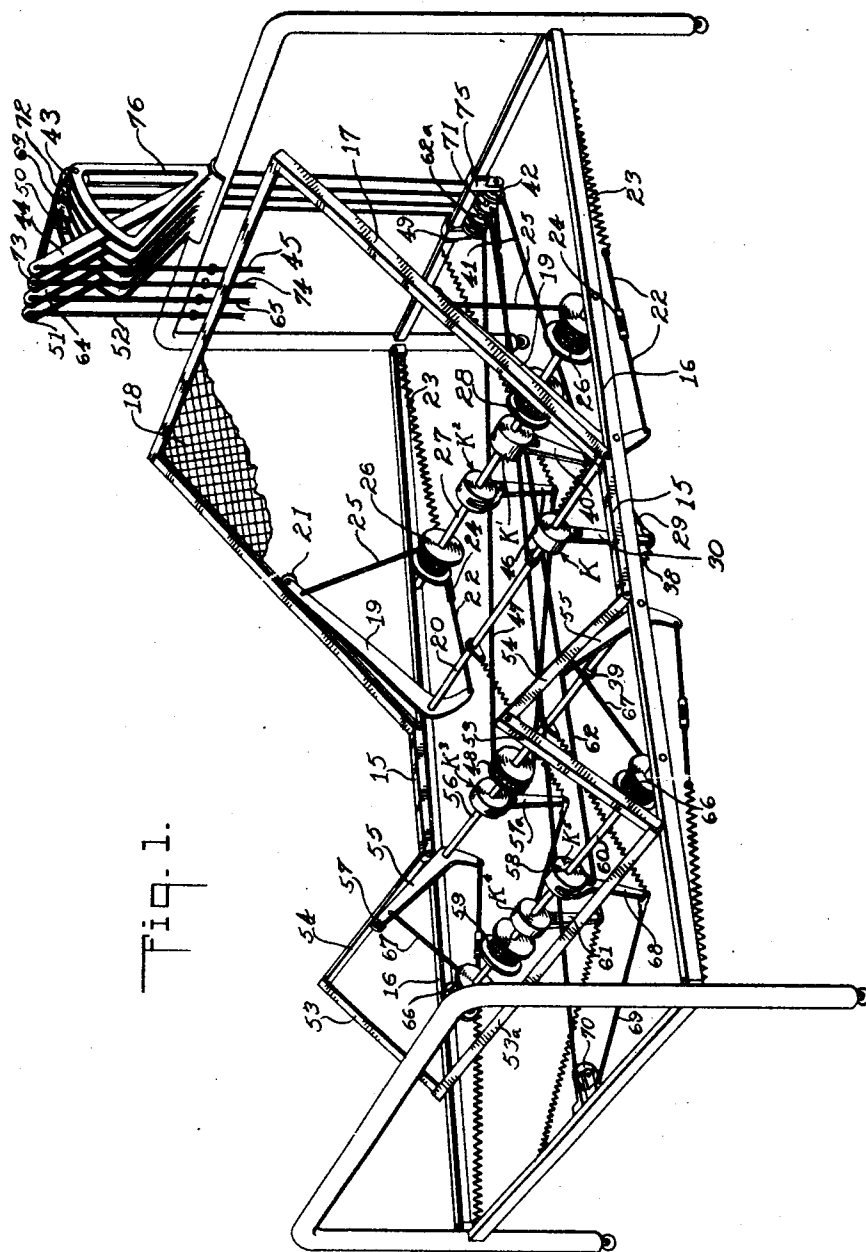


Fig. 1.

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Fig. 2.

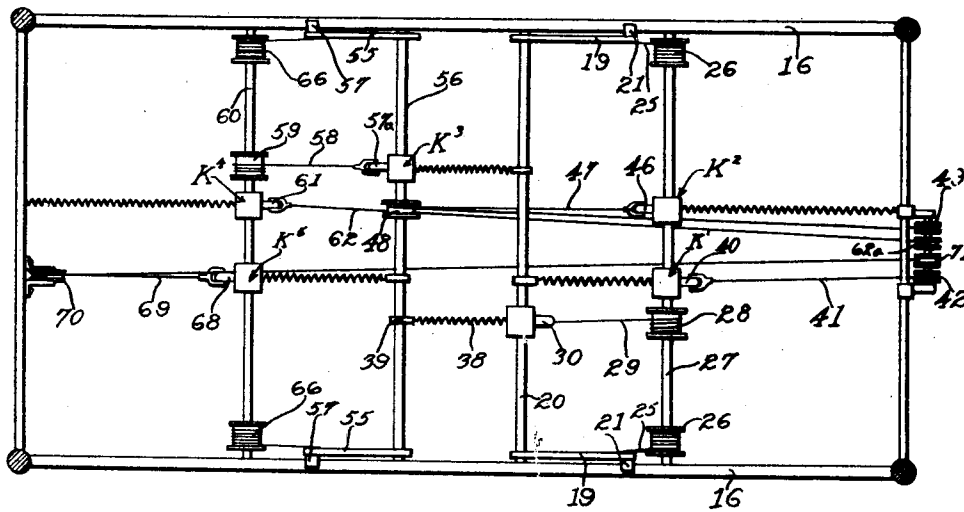


Fig. 3.

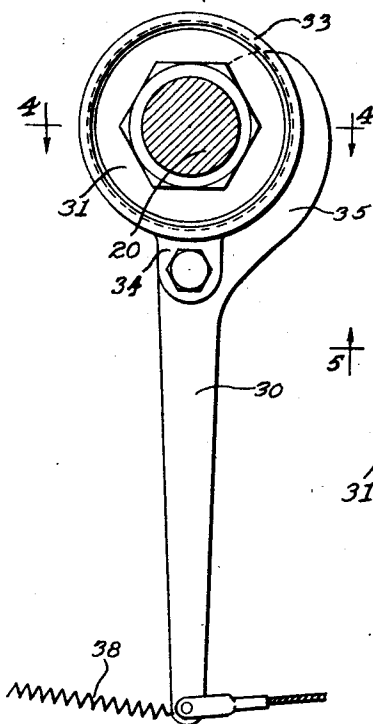


Fig. 4.

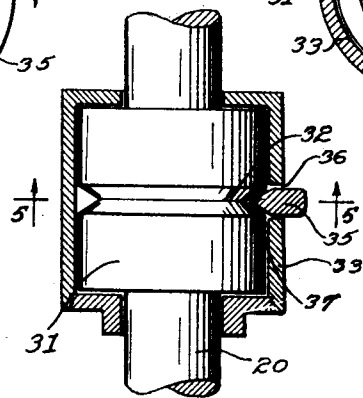
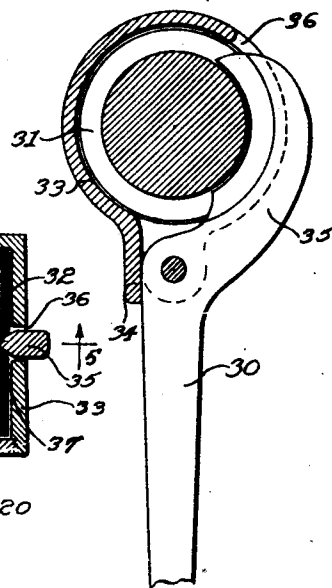


Fig. 5.



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BED ATTACHMENT.

Application filed May 9, 1927. Serial No. 189,996.

Our invention relates to attachments for beds of that character which permits the occupant of a bed to raise himself to any inclined position desired or to a sitting posture and whereby the necessity of other persons than the occupant of the bed to operate the attachment either in raising or lowering the occupant is eliminated.

It is a purpose of our invention to provide an extremely simple, durable and inexpensive attachment for beds which not only permits the occupant to raise himself to a sitting posture or to any inclined position but to elevate and flex the legs, there being separate frames and mechanisms for accomplishing the two functions, both of which are operable by the occupant of the bed.

It is also a purpose of our invention to provide a bed attachment in which the back and leg frames are counterbalanced to facilitate elevation of the two with the least possible physical effort.

We will describe only one form of bed attachment embodying our invention, and will then point out the novel features thereof in claims.

In the drawings

Figure 1 is a view showing in perspective a conventional form of bed having applied thereto one form of attachment embodying our invention;

Figure 2 is a plan view, somewhat diagrammatic, of the bed attachment shown in Figure 1, and in applied position to a bed;

Figure 3 is an enlarged detail view showing in side elevation one of the clutches embodied in the attachment shown in the preceding views;

Figure 4 is a horizontal sectional view taken on the line 4—4 of Figure 3;

Figure 5 is a vertical sectional view taken on the line 5—5 of Figure 4.

Referring specifically to the drawings, our invention comprises in its present embodiment a pair of bars 15 secured in any suitable manner to the side rails 16 of a bed frame, and pivotally mounted on the forward ends of these bars are the ends of a U-shaped back frame 17 having therein a bed spring 18. This frame 17 is adapted to be elevated from a horizontal position by means of a pair of bell crank arms 19 secured to a shaft 20 journaled in the side rails 16 of the bed frame. The upper ends of these arms 19 are provided with rollers 21 which have rolling contact with the under side of the

side portions of the back frame 17, while connected to the lower ends of the arms are devices for counterbalancing the weight of the frame for the purpose of facilitating the raising and lowering thereof. Each device in the present instance comprises a pair of rods 22, one of which is connected to the lower end of the corresponding arm 19, while the other is connected to a contractile spring 23. The spring in turn is connected to the bed frame. The confronting ends of the two rods 22 are adjustably connected by means of a turnbuckle 24 whereby the active tension of the spring 23 can be increased as desired to secure the required counterbalancing action.

Connected to the upper ends of the arms 19 adjacent the rollers 21 are a pair of cables 25 trained about drums 26 fixed to a shaft 27 journaled in the side rails of the bed frame. The shaft 27 is provided with a third drum 28 about which is trained a cable 29 connected to an operating lever 30 of a clutch member K. Our invention includes a number of these clutch members and operating levers, and as they are all of identical construction a detailed description of one will suffice for all. As shown in Figures 3, 4 and 5, the present clutch member comprises a head 31 formed with an annular groove 32 of U-shape in cross section. This head 31 is fixed to or formed integral with the corresponding shaft, which in the present instance is the shaft 20, so as to rotate the latter when actuated.

A casing 33 is freely rotatable on the head 31 and is provided with an extension 34 on which is fulcrumed a lever 30. The lever is provided with an arcuate extension 35 movable in a slot 36 of the casing 33 and formed with a V-shaped edge 37 adapted to seat within the groove 32 so that when the lever is bodily rotated with the casing 33, rotation of the head 31, and consequently the shaft 20, will be effected. Through the medium of a spring 38 the extension 35 of the lever 30 is yieldably urged to a position in which the edge 37 does not contact with the walls of the groove 32 so that the shaft 20 can rotate independently of the casing and lever.

By means of a collar 39 the spring 38 can be attached to any adjacent suitable part of the mechanism for holding the spring expanded. In the present instance the collar 39 is loosely mounted on an adjacent shaft which is a part of the mechanism for actuating the leg flexing frames. All of the

other clutch members are likewise provided with springs and collars associated with the levers for yieldably urging the latter to non-operative positions with respect to the heads 31.

In the elevation of the back frame 17 the arms 19 can be elevated through proper rotation of the shaft 20. The shaft 20 is adapted to be rotated by an actuation of the operating lever 30. To operate the lever 30 it is necessary to wind the cable 29 upon the drum 28 and this is effected by rotation of the shaft 27 in a counterclockwise direction as when viewed in Figure 1. The shaft 27 is rotated in this direction by operation of a lever 40 of a clutch member K^2 , the lever in turn being operable by a cable 41 extended forwardly and around a pulley 42. The cable extends upwardly from the pulley over a second pulley 43, whence it is connected to the upper end of a lever 44. An operating cord 45 is connected to the upper end of the lever 44 and is of such length as to be within easy reach of the occupant of the bed so that by pulling downwardly thereon the lever will be moved forwardly to actuate the cable 41 and thereby operate the lever 40 to rotate the shaft 27. During such rotation of the shaft 27 the reels 26 are rotated to permit unwinding of the cables 25 so as to not interfere with the upward movement of the arms 19 in elevating the back frame 17.

To lower the frame 17 the arms 19 can be moved downwardly by winding the cables 25 upon the reels 26. This is effected by rotation of the shaft 27 in the reverse direction and through operation of a lever 46 of a clutch member K^2 . The lever 46 is actuated through the medium of a cable 47 trained over a pulley 48 and then extended forwardly around pulleys 49 and 50, whence it is connected to a lever 51 provided with an operating cord 52 within easy reach of the occupant of the bed.

For elevating and flexing the legs of the occupant as is customary in hospital beds of this general character, we provide a pair of frames each including a pair of bars 53 and 54 pivotally connected to each other at their confronting ends and with the forward end of the bar 54 pivotally connected to the end of the corresponding bar 15. The bars 53 are rigidly connected to each other by a cross bar 53^a so that the two frames move together and in correlation to constitute a single frame. By the elevation of arms 55 the bars 54 can be elevated from a horizontal position and by virtue of the pivotal connection of the bars 53 with the bars 54 it will be clear that when the latter are elevated the elevation of the bars 53 will likewise be effected so that the two frame assume a V-form so that a mattress overlying and spanning the frames will be bulged upwardly to elevate and upwardly flex the legs of the occupant.

To elevate the arms 55 they are fixed to a shaft 56 journaled in the side rails 16 of the bed frame, the upper ends of the arms carrying rollers 57 for rolling contact with the bars 54, while the lower ends are connected to counterbalancing devices identical in construction and operation to the previously described devices. Rotation of the shaft 56 to elevate the arms 55 is effected by an operating lever 57^a and a clutch member K^3 , the lever being operated by a cable 58 trained about a reel 59 fixed to a shaft 60. The shaft 60 in turn is rotated in one direction to effect winding of the cable 58 on the reel 59 of a lever 61 and a clutch member K^4 , the lever being attached to a cable 62 which extends forwardly and upwardly around pulleys 62^a and 63, where the cable is connected to a lever 64 provided with an operating cord 65 within easy reach of the occupant of the bed. The shaft 60 is provided with a pair of reels 66 about which are trained cables 67 connected to the upper ends of the arms 55 so that by rotation of the shaft 60 in the opposite direction the cables will be wound upon the reels to lower the arms and permit collapsing of the frames. The shaft is rotated in this direction through a lever 68 and a clutch member K^5 , the lever being connected to a cable 69 trained about a pulley 70 secured to the foot end of the bed frame and extended forwardly from such pulley to the head end of the bed frame where it is extended upwardly about pulleys 71 and 72 and connected to an operating lever 73 provided with a cord 74 within easy reach of the occupant of the bed.

It will be understood that with rotation of the shaft 60 to wind the cables 67 on the reel 66, an unwinding of the cable 58 from the reel 59 will be effected to prevent operation of the lever 57. Conversely, when the shaft is rotated in the opposite direction the cables 67 will be unwound from the reels 66 to permit the arms 55 to be elevated.

All of the pulleys 42, 49 and 62 and 71 are mounted in a common frame indicated at 75, secured in any suitable manner to the head end rail of the bed frame. All of the pulleys 43, 63, etc. as well as the levers 44, 64, etc. are mounted on a common frame indicated at 76 and which is suitably secured to the top of a head of the bed frame.

Although we have herein shown and described only one form of bed attachment embodying our invention, it is to be understood that various changes and modifications may be made therein without departing from the spirit of the invention, and within the spirit of the appended claims.

We claim:

1. A bed attachment comprising a frame pivotally supported to permit elevation and lowering thereof, a shaft, arms fixed to the shaft and engageable with the frame to effect

lowering or elevation of the frame as the arms are moved in one direction or the other, a second shaft, a reel fixed to the second shaft, a cable on the reel, a lever to which said cable is connected, a clutch member on the first shaft and on which said lever is supported to effect rotation of the shaft when the lever is actuated, and means operable from a remote point for rotating the second shaft in one direction to wind the cable on said reel and thereby effect operation of said lever.

2. A bed attachment comprising a frame pivotally supported to permit elevation and lowering thereof, a shaft, arms fixed to the shaft and engageable with the frame to effect lowering or elevation of the frame as the arms are moved in one direction or the other, a second shaft, a reel fixed to the second shaft, a cable on the reel, a lever to which said cable is connected, a clutch member on the first shaft and on which said lever is supported to effect rotation of the shaft when the lever is actuated, a pair of reels fixed to the second shaft and having cables connected to said arms, means for rotating the second shaft in one direction to effect winding of the first cable on the first reel to actuate said lever, and means for rotating the second shaft in the opposite direction to cause the second mentioned cables to be wound on corresponding reels and thereby effect a lowering of said arms.

3. A bed attachment as embodied in claim 2, wherein both of said means includes levers, clutch members, and cables for actuating the levers from remote points.

4. A bed attachment as embodied in claim 2 wherein each clutch member includes a head secured to the respective shaft and provided with a groove, a casing rotatable on the head and upon which said lever is mounted, an extension on the lever adapted to engage within the groove when the lever is rotated in one direction to provide an operative connection between the lever and head, and yieldable means for urging the lever to a position in which the extension is removed from the groove.

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