

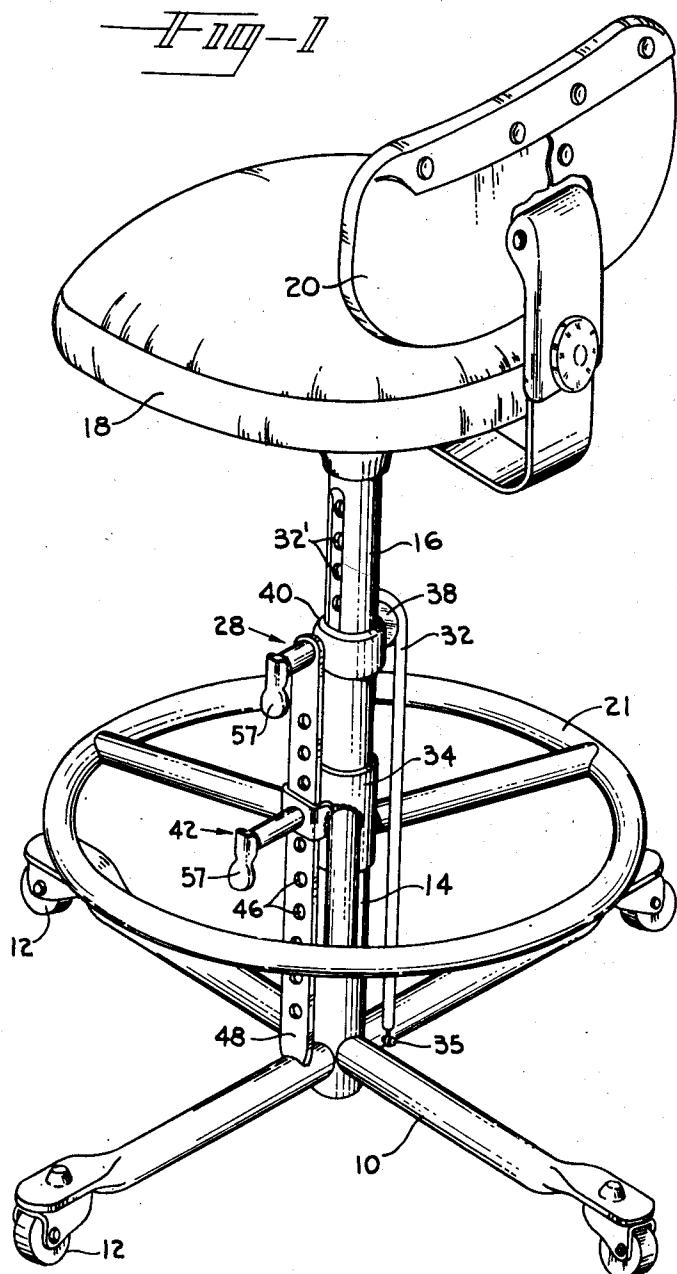
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POSTURE CHAIR

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2 Sheets-Sheet 1



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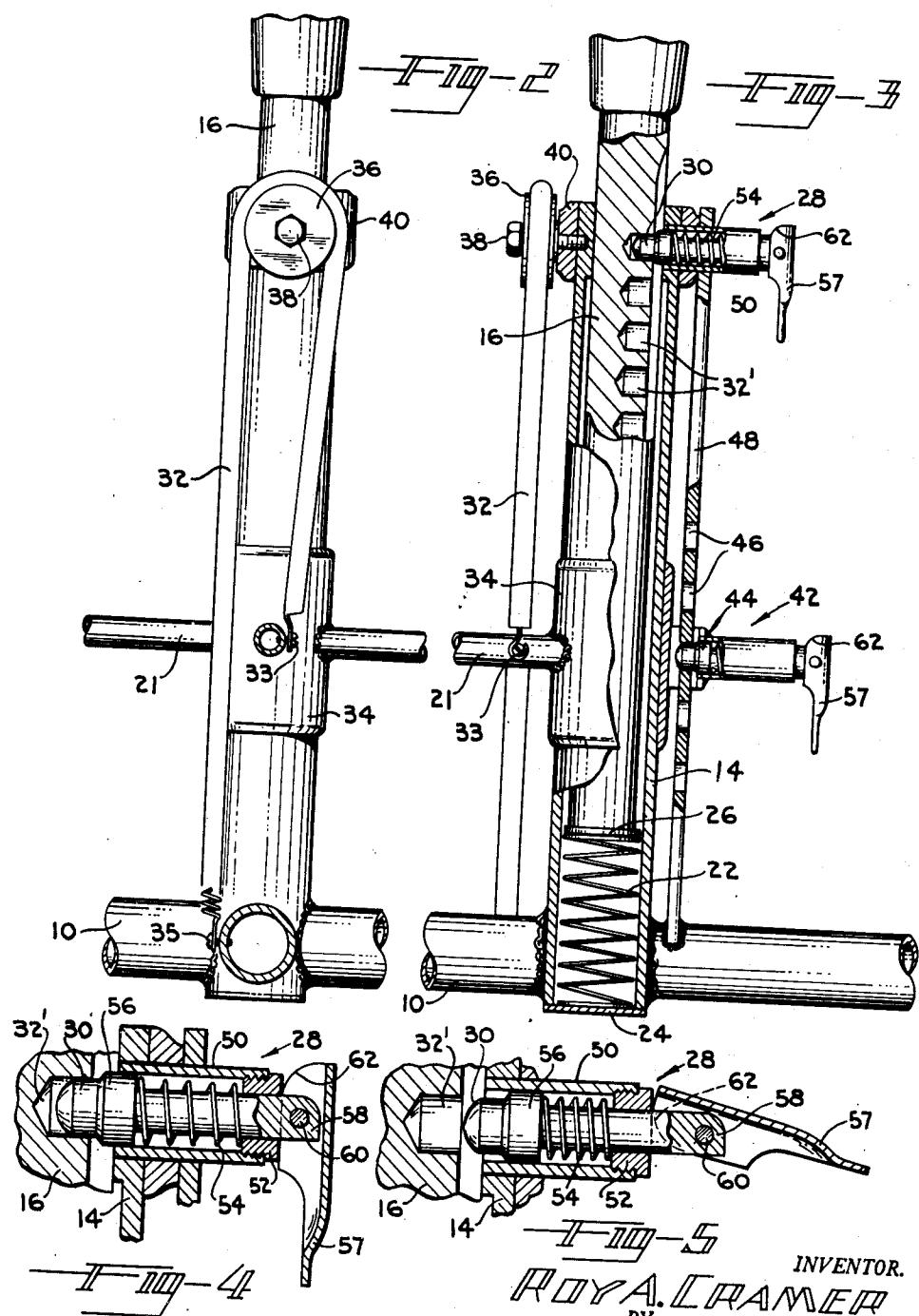
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POSTURE CHAIR

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9 Claims. (Cl. 155—94)

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This invention relates to posture chairs and more particularly to chairs of the type provided with foot rests, together with provision for adjusting the height of the chair seat and the position of the foot rest.

Chairs of the general type to which the present invention appertains have heretofore been provided. That is to say, such chairs have embodied an adjustable seat-supporting pedestal together with an adjustable foot rest or ring. In cases employing changing shifts of workers, as for example in switch board work and applications of a like nature where frequent height adjustments of the seat and foot rest are required, chairs of the above type are especially desirable. It has been found however, that the chairs heretofore proposed have certain objections and disadvantages, especially where it is desired to vary the adjustments quickly and with a minimum of effort.

Accordingly, one of the principal objects of the present invention is to provide a novel posture chair wherein the adjusting mechanisms for the seat and foot rest are of such a character that the desired adjustments may be made with a minimum of time and effort.

A further object of the invention is to provide a posture chair of the above character which is so constructed and arranged that the seat is self-elevating except when locked in any desired position of vertical adjustment.

Another object is to provide a novel foot rest construction which is self-elevating independently of the seat, except when the foot rest is locked at a desired position.

A further object is to provide a novel locking mechanism for the seat and foot rest which is so arranged as to positively lock these parts in any desirable adjusted position, and to be incapable of accidentally remaining in an unlocked condition.

A still further object resides in the novel construction and cooperative relationship of the parts hereinafter described in detail, all of these resulting in a highly efficient arrangement insuring quick, easy and positive operation during the adjustment of the seat height and the position of the foot rest.

Other objects and novel features of the invention will appear more fully hereinafter from a consideration of the following detailed description when taken in connection with the accompanying drawings illustrative of one form of the invention. It is to be expressly understood however, that the drawings are employed for pur-

poses of illustration only and are not to be taken as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

5 In the drawings, wherein similar reference characters refer to similar parts throughout the several views;

Fig. 1 is a perspective view of a posture chair embodying the principles of the present invention;

Fig. 2 is a partial view taken from one side of the chair and illustrating the novel construction for automatically raising the foot rest;

Fig. 3 is a side view partly in section and taken substantially at right angles to Fig. 2;

Fig. 4 is a partial sectional view of one of the locking plungers shown in locked position, and

Fig. 5 is a view similar to Fig. 4 but illustrating the plunger in unlocked position.

20 Referring more particularly to Fig. 1, the present invention is illustrated therein as comprising a base 10 having a plurality of casters 12, and provided with an upwardly extending tubular support 14 for slidably receiving a chair pedestal 16. A seat 18 is supported upon the upper end of the pedestal 16, and preferably such seat is rotatably mounted and provided with an adjustable back rest 20. Slidably mounted on the support 14 is a foot ring or rest 21, and as will appear more fully hereinafter, such foot rest is self-elevating to facilitate adjustment thereof with respect to the seat. The details of construction of the seat and back rest form no part of the present invention and further description thereof is hence, not believed to be necessary.

One of the important features of the present invention resides in the provision of an arrangement for automatically elevating the seat except when the latter is locked in a desired position of vertical adjustment. To this end, an expandable spring 22 is confined within the support 14 between a closure cap 24 and the lower end 26 of the pedestal 16, such spring constantly acting to raise the said pedestal with respect to the base 10 and the support 14. A locking device 28 carried by the support 14 adjacent the upper end thereof, includes a locking plunger 30 which is projectible into one of a plurality of spaced openings 32' in the pedestal 16 for locking the latter and the seat 18 in any desired position of vertical adjustment. From this construction it will be readily seen that when the locking plunger 30 is moved to the unlocked position, the action of the spring 22 automatically raises the

pedestal 16 and the seat 18. This automatic elevation of the seat is preferably resisted by the hand of the operator so that proper seat adjustment may be rapidly accomplished prior to projection of the locking plunger to its locked position.

A further feature of the invention includes an arrangement for automatically raising the foot ring 21 with respect to the seat 18 so that proper adjustment of said ring may be effected in a rapid manner. As shown, such arrangement includes a contractile resilient member 32, opposite ends of which are respectively connected to the foot ring 21 and the base 19 at 33 and 35, it being pointed out that the foot ring is provided with a hub sleeve 34 which is slidably mounted on the support 14. Referring more particularly to Figs. 2 and 3, the member 32, intermediate its ends, is received by a grooved pulley or wheel 36, the latter being mounted upon a shaft 38 which is threadedly received by a collar 40 and the upper end of the support 14. The resilient member 32, which may be formed as a coiled spring or as a shock cord of rubber or like material, is assembled as above set forth under tension, so that its action will constantly tend to raise the foot ring 21 with respect to the seat 18 and the base 19. A locking device 42, similar to the locking device 28, is provided with a projectible locking plunger 44 which may be received in a selected one of a plurality of openings 46 in a latching member 48 which is secured to the base 19 at one end thereof. In this manner, the foot ring 21 may be unlocked and thereafter allowed to automatically elevate or be depressed, under the control of the operator. Thereafter it is only necessary to release the device 42 to lock the foot ring at the desired height.

In order to secure an efficient operation of the locking devices 28 and 42, which are of similar construction as above stated, a novel locking plunger and cam actuator are employed. Referring more particularly to Figs. 3, 4 and 5, the device 28 includes a housing 50 which is fixed within suitable openings provided in the upper end of the latching member 48, the collar 40 and the support 14. In this manner the member 48 is firmly secured to the support 14 adjacent its upper end. The open end of the housing 50 is closed by a threaded apertured member 52 and the plunger 30 is slidably mounted as shown, a spring 54 being confined between the member 52 and an enlarged part 56 of the plunger and constantly acting to project the plunger to the locking position illustrated in Fig. 4. The right end 58 of the plunger projects outwardly from the housing 50 and is pivotally connected to an actuating lever 51 as by a pivot pin 60. More particularly, the lever 51 is channel shaped in cross section to provide two side pieces which embrace the end 58 and which are curved in order to provide camming parts 62 which bear against the member 52 to cam the plunger 30 to its unlocked position as the lever 51 is moved to the position shown in Fig. 5. Preferably the curvature of the camming parts 62 is such that as the lever 51 is moved to unlock the plunger, the areas of contact between such parts and the member 52 will always be displaced from the axis of the plunger, which axis passes through the pivot pin 60. Thus even if the lever is moved to a position where it is axially parallel with the plunger 30, and the base of the channel shaped lever 51 engages the plunger 30, the said areas of contact will be displaced above the plunger axis. With such an ar-

rangement, should the operator remove his hand from the lever 51 when the latter occupies said parallel position, the action of the spring 54 will project the plunger 30 toward the left and cam the lever 51 in a clockwise direction about its pivot 60. Hence, the construction provided avoids any possibility of the plunger being latched in an unlocked condition during the adjusting operation. This materially facilitates the unlocking and locking actions of the devices 28 and 42.

In operation, and assuming that the parts occupy the relative positions illustrated in Fig. 1, should it be desired to effect a vertical adjustment of the seat 18, the following procedure is followed. The operator first places his hand upon the seat 18 and thereafter moves the lever 51 of the locking device 28 in a direction to unlock the plunger 30 with respect to the pedestal 16. As soon as the unlocking action has been effected, it will be readily understood that the action of the spring 22 tends to automatically elevate the pedestal 16 and the seat 18 against the resistance of the operator's hand. With the plunger 30 in its unlocked condition, it will be clear that a proper height adjustment of the seat 18 may be readily achieved by either allowing the seat 18 to rise in accordance with the expansion of the spring 22 or by pressing the seat downwardly against the force of said spring. As soon as the desired height adjustment has been secured, the operator releases the lever 51 whereupon the spring 54 immediately projects the plunger 30 to the locking position illustrated in Fig. 3. In the event that one of the openings 32' is in registry with the end of the plunger 30 does not register with the operator to remove his hand from the seat 18 in order to allow further upward movement of the pedestal 16 in order to bring the desired opening 32 in registry with the end of plunger 30.

Following the above adjustment, a similar operation is carried out if it is desirable to adjust the height of the foot ring 21 with respect to the seat. In this case, the plunger 44 is moved to its unlocked position whereupon the foot ring 21 tends to automatically be elevated in response to the action of the resilient member 32. The automatic elevation of the foot rest is controlled by the hand of the operator and as soon as the desired adjustment is secured, the lever associated with the locking device 42 is released and the plunger 44 will be received in the proper opening 46 of the latching member 48.

In making both the above adjustments, it will be recalled that due to the camming parts 62 of the levers associated with the locking devices 28 and 42, neither of the latter may ever be latched in an unlocked condition. This feature is highly desirable and contributes to the positive locking action of the locking devices and greatly simplifies the adjusting operations.

From the foregoing, it will be readily perceived that the present invention provides a novel posture chair construction which is well adapted for use where frequent height adjustments of the seat and/or foot rest are necessary. The provision of the spring 22 results in an automatic self-elevating action of the seat and seat pedestal when these parts are unlocked with respect to the base. Thus a proper height adjustment may be quickly and smoothly achieved. In like manner, the arrangement of the resilient member 32 in connection with the foot rest 21 also enables a quick and ready adjustment of the height of the foot rest with respect to the seat. The locking devices 28 and 42 and their associated

levers for camming the locking plungers to their unlocked positions, provide a relatively simple but highly efficient arrangement which may be readily operated by a finger of the operator.

While a preferred embodiment of the invention has been shown and described herein with considerable particularity, it will be readily understood by those skilled in the art that the invention is not limited to the form shown but is capable of a wide variety of expressions without departing from the spirit of the invention. Reference will therefore be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. A chair comprising a base having a support extending upwardly therefrom, a seat, a pedestal supporting the seat and slidably mounted in the support, a foot rest slidably mounted on the support, resilient means for automatically raising the foot rest with respect to the support, and means carried by the foot rest and cooperating with the support for locking the foot rest in a desired position of vertical adjustment.

2. A chair comprising a base having a tubular support extending upwardly therefrom, a seat, a pedestal supporting the seat and slidably mounted in the support, means for automatically raising said pedestal and seat with respect to the base comprising an expandable spring housed within the support, means including a locking plunger carried by the support and receivable in a selected one of a plurality of openings provided in the pedestal for locking the latter at a desired position of vertical adjustment, a foot rest slidably mounted on the support, resilient means for automatically raising the foot rest with respect to the support, and means for locking the foot rest in a desired position of vertical adjustment comprising a vertically extending latch member secured to the support and provided with a plurality of spaced openings, and a locking plunger carried by the foot rest and receivable in a selected one of said plurality of openings.

3. In a chair having a base provided with a support extending upwardly therefrom, a seat, and a pedestal supporting the seat and slidably mounted in the support, a foot rest slidably mounted on the support, means for automatically raising the foot rest with respect to the support comprising a contractile resilient member having its opposite ends respectively connected with the base and foot rest together with a support for said resilient member carried by the first named support above the foot rest, and means carried by the foot rest and cooperating with said first named support for locking the foot rest in a desired position of vertical adjustment.

4. A chair comprising a base having a tubular support extending upwardly therefrom, a seat, a pedestal supporting the seat and slidably mounted in the support, said pedestal provided with a plurality of spaced apart openings, a foot ring provided with a hub slidably mounted on the support, a wheel rotatably mounted on the support above the foot ring, a contractile resilient member passing over the wheel and having its opposite ends respectively connected with the foot ring and the base to automatically raise the foot ring with respect to the base and support, a latch member extending upwardly from the base and provided with a plurality of spaced apart openings therein, a locking member carried by the foot ring and receivable in a selected one of said openings, and a tubular housing connecting the upper end of the latch member with the upper end of the tubular support, a locking plunger within the housing, having an end projecting outwardly therefrom, a spring in the housing for urging said plunger into locking position with a selected one of said openings in the pedestal, and a manually operable member pivoted to said projecting end for retracting the plunger to unlock the pedestal, said last named member comprising a channel shaped lever providing a pair of opposite side portions for receiving said projecting end of the plunger, the ends of said side portions being curved to provide

tubular housing connecting the upper end of the latch member with the upper end of the tubular support, a locking plunger within the housing having an end projecting outwardly therefrom, a spring in the housing for urging said plunger into locking position with a selected one of said openings in the pedestal, and a lever pivoted to the plunger and having a cam part engageable with the housing for moving the plunger within the housing to an unlocking position upon movement of the lever about the pivot.

5. In a chair of the type comprising a base having a hollow support, a seat, a pedestal supporting the seat and slidably mounted in the support, said pedestal being provided with a plurality of spaced apart openings, and means for locking said pedestal to the support in a desired position of vertical adjustment, the improvement which comprises a housing carried by the support, a locking plunger slidably mounted within the housing and having one end projectible into a selected opening in the pedestal and having the opposite end extending outside of the housing, a spring within the housing constantly urging the plunger toward its projected position, and a manually operable lever for moving said plunger to an unlocking position, said lever being channel shaped and providing a pair of opposite side portions pivoted to said opposite end of the plunger, and providing also a base portion connecting said side portions, each of the side portions having curved ends to engage the housing to cam the plunger to its unlocked position against the tension of said spring upon pivotal movement of the lever from a normal position at right angles with respect to the plunger to a position where the lever is parallel with the plunger and said base portion contacts said plunger, the areas of engagement between the curved ends of said side portions and the housing being displaced from the axis of the plunger when the lever and plunger are parallel so that the spring moves the plunger to its projected position and cams the lever to said normal position when said lever is released.

6. A chair comprising a base having a tubular support extending upwardly therefrom, a seat, a pedestal supporting the seat and slidably mounted in the support, said pedestal provided with a plurality of spaced openings, a foot ring provided with a hub slidably mounted on the support, a wheel rotatably mounted on the support above the foot ring, a contractile resilient member passing over the wheel and having its opposite ends respectively connected with the foot ring and the base to automatically raise the foot ring with respect to the base and support, a latch member extending upwardly from the base and provided with a plurality of spaced openings therein, a locking member carried by the foot ring and receivable in a selected one of said openings in said latch member, a tubular housing connecting the upper end of the latch member with the upper end of the tubular support, a locking plunger within the housing, having an end projecting outwardly therefrom, a spring in the housing for urging said plunger into locking position with a selected one of said openings in the pedestal, and a manually operable member pivoted to said projecting end for retracting the plunger to unlock the pedestal, said last named member comprising a channel shaped lever providing a pair of opposite side portions for receiving said projecting end of the plunger, the ends of said side portions being curved to provide

camming parts which bear against the housing to retract the plunger as the lever is moved about the pivotal connection with the plunger.

7. A chair as set forth in claim 6 wherein the area of engagement between said curved ends of the lever and the housing is displaced from the axis of the plunger.

8. In a chair having a base provided with an opening, a seat, a pedestal supporting said seat and slidably mounted in the opening in the base, means carried by the base for locking the pedestal at a desired vertical position, a foot ring having a hub slidably mounted on the base, a wheel rotatably carried by the base above the foot ring, a contractile resilient member passing over 10 said wheel and having its opposite ends respectively connected with the foot ring and the base below the foot ring to automatically raise the foot ring with respect to the base, a latch member having a plurality of spaced openings there- 20 in and secured to the base, a housing carried by the hub, said housing having an apertured end-closing member, a locking plunger slidably mounted within the housing and projectible into a selected opening in the latch member to lock 25 the foot ring in a desired position of vertical adjustment, said plunger having an end portion projecting through said end-closing member,

5 resilient means within the housing for projecting the plunger into locking position, and a manually operable member pivoted to said end portion for retracting the plunger to unlock the foot ring, said last named member comprising a channel shaped lever providing a pair of opposite side portions for receiving said projecting end portion, the ends of the said side portions being curved to provide camming parts which bear against said end-closing member to retract the plunger as the lever is moved about the pivotal connection with the plunger.

9. A chair as set forth in claim 8 wherein the area of engagement between said curved ends of the lever and the end-closing member is displaced from the axis of the plunger.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
277,759	Maguire	May 15, 1883
316,281	Matthie	Apr. 21, 1885
373,249	Lang	Dec. 10, 1907
1,001,417	Loos	Aug. 22, 1911
1,610,069	Weber	Dec. 7, 1926
2,308,358	Cramer	Jan. 12, 1943
2,516,801	Renaud	July 25, 1950