

[54] **HEIGHT-ADJUSTABLE TREE SEAT**

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[58] Field of Search.....182/133, 134, 13,
182/187, 141

[56] **References Cited**

UNITED STATES PATENTS

3,520,383 7/1970 Look182/133
3,338,332 8/1967 Brantly.....182/187

3,124,213	3/1964	Jorsey	182/13
1,299,289	4/1919	Berg	182/133
742,447	10/1903	Kidder.....	182/133
2,654,638	10/1953	Elliott.....	182/133

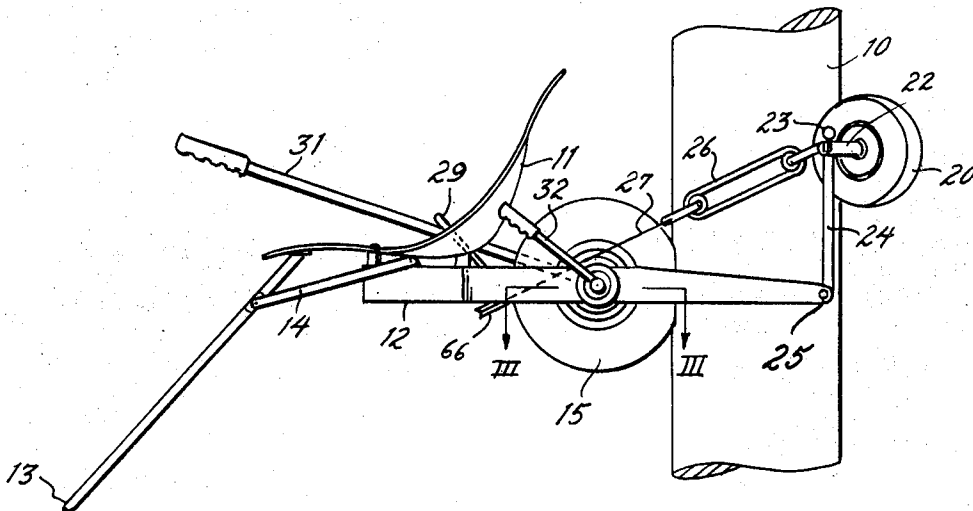
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[57] **ABSTRACT**

Apparatus for ascending and descending a tree, pole, or similar cylindrical vertical member is provided with a seat and with manually operable mechanism so that a person seated thereon can raise and lower himself along the vertical member. Height is determined by controlling rotation of a positioning wheel having a resilient peripheral surface in frictional engagement with the vertical member.

10 Claims, 6 Drawing Figures



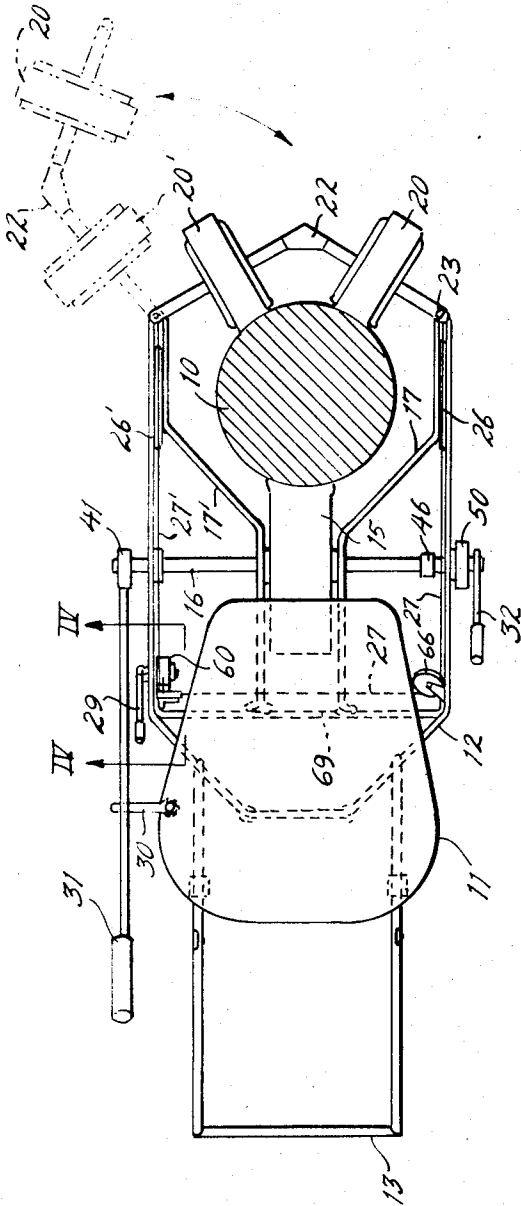


Fig. 2.

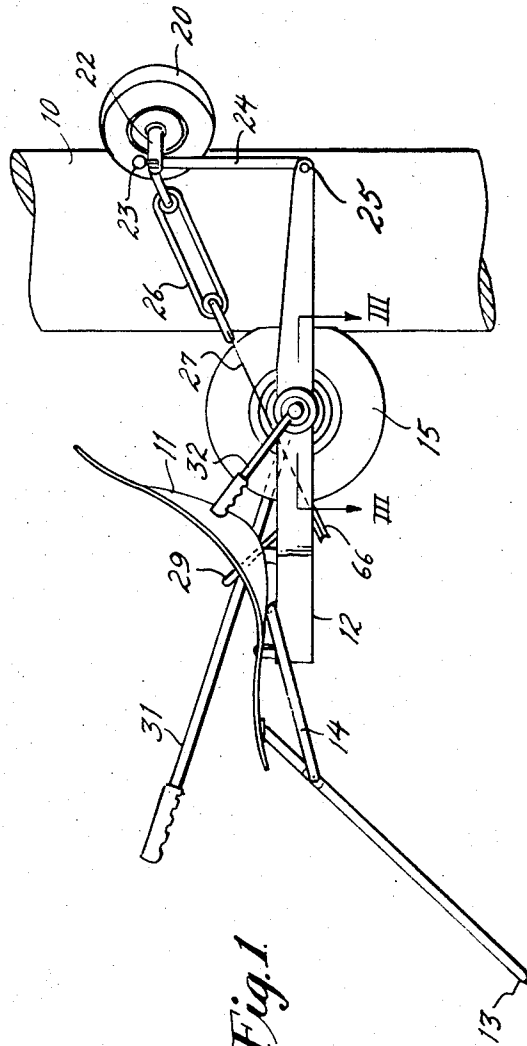
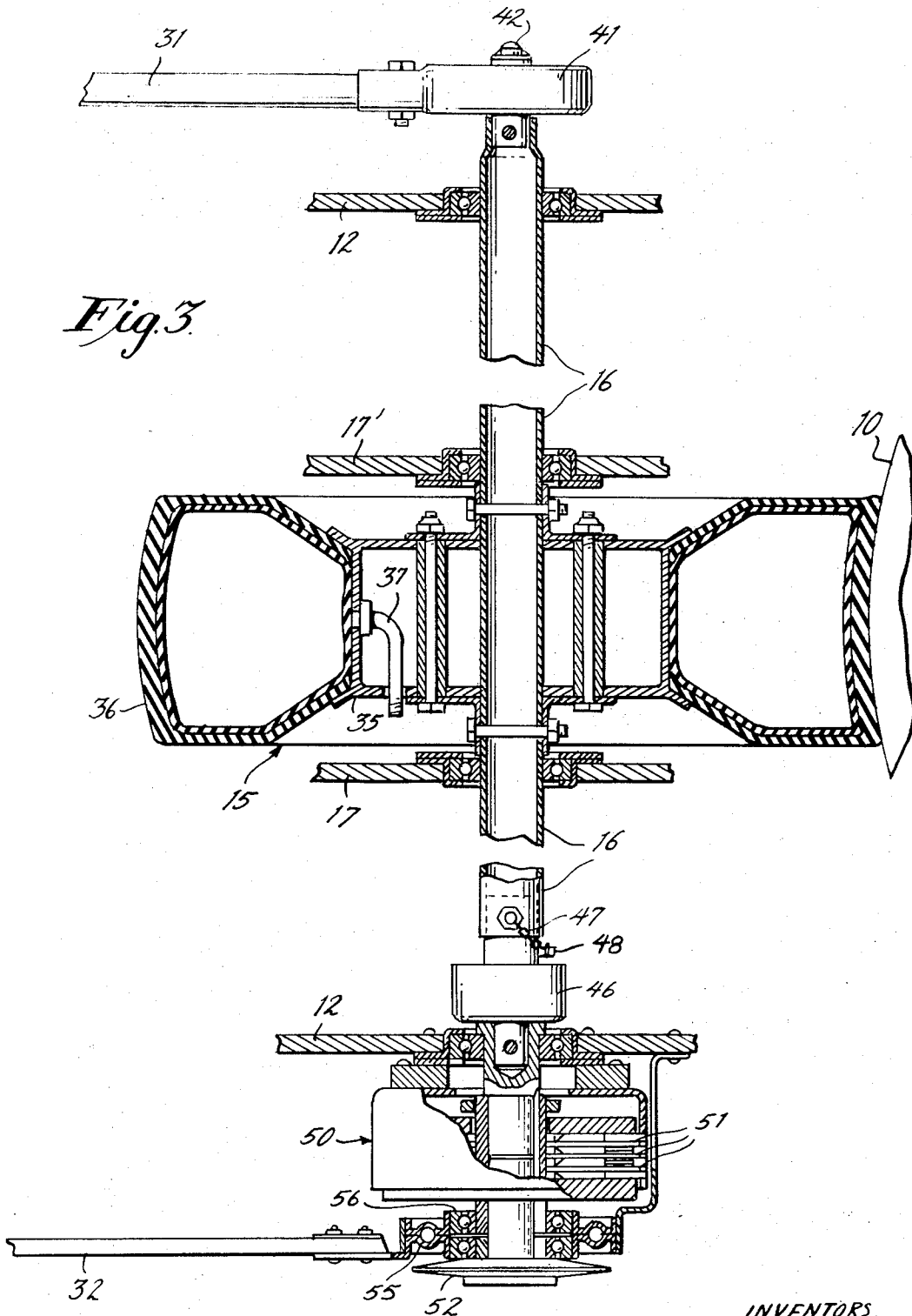


Fig. 1.

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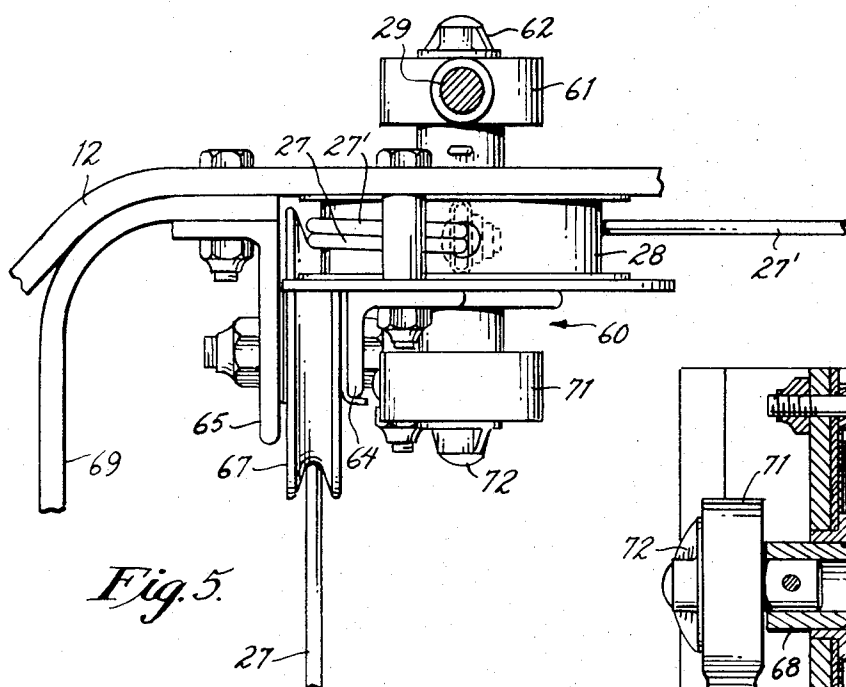


Fig. 5.

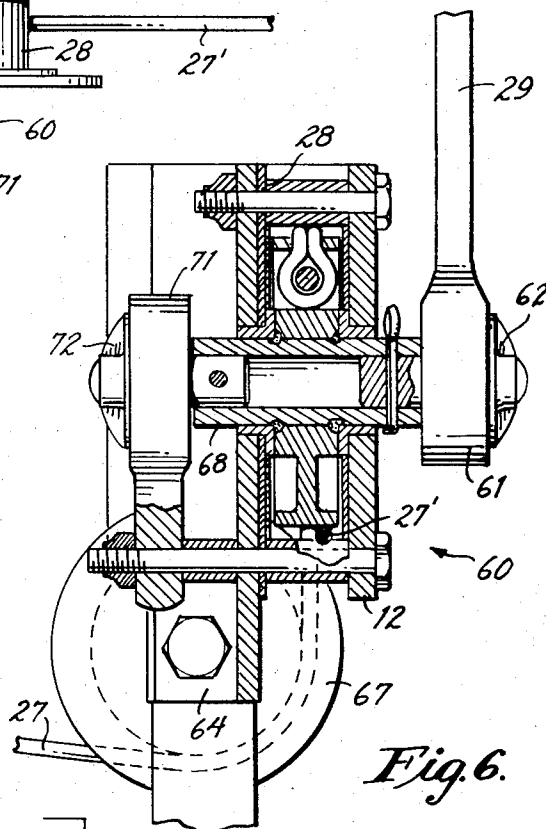


Fig. 6.

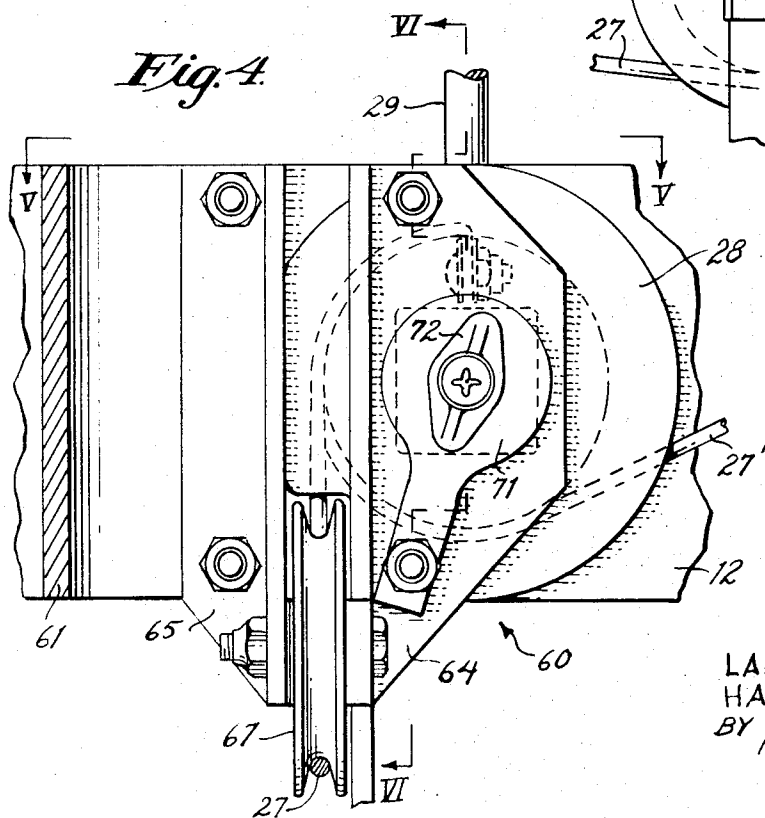


Fig. 4.

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HEIGHT-ADJUSTABLE TREE SEAT

This invention relates to a height-adjustable tree seat or the like manually operable by a person seated thereon.

Conventional apparatus for use in climbing or descending a tree, pole, or other generally cylindrical vertical member requires the climber to use his legs and to face the tree or similar member in doing so. There is need for apparatus adapted to ascend and descend a vertical member and operable by the user while in a seated position and/or facing away from the tree. Such apparatus would provide the user thereof with greatly improved freedom to survey the surrounding landscape and to use a camera, gun, or other device held by him or mounted on the apparatus. Of course, the actuating mechanism of such apparatus must be positive in action and safe in operation.

A primary object of the present invention is provision of a manually operable height-adjustable tree seat apparatus or the like.

Another object is provision of such apparatus with automatic adaptation to variation in circumference of the tree or other generally cylindrical vertical member along which the tree seat travels.

A further object is provision of such apparatus with safe positively actuating mechanism.

Other objects of the present invention, together with means and methods for attaining the foregoing objects, will be apparent from the following description and the accompanying diagrams of a preferred embodiment thereof, which is presented by way of example rather than limitation.

FIG. 1 is a side elevation of tree seat apparatus of this invention shown in operative juxtaposition to a vertical member;

FIG. 2 is a plan view of the apparatus of FIG. 1, with the vertical member sectioned, and showing part of the apparatus in an alternative position (represented in broken lines) to which it is swung preparatory to engagement or to effect disengagement therewith;

FIG. 3 is a sectional plan of the same apparatus taken at III—III on FIG. 1;

FIG. 4 is a fragmentary sectional elevation taken at IV—IV on FIG. 2;

FIG. 5 is a plan view, partly in section, taken at V—V on FIG. 4; and

FIG. 6 is a rear sectional elevation taken at VI—VI on FIG. 4.

In general, the objects of the present invention are accomplished, in apparatus for ascending and descending a tree, pole, column, or other generally cylindrical vertical member, by providing a frame having means thereon for supporting a person and a manually operable positioning wheel mounted on a horizontal axle carried on the frame for frictional engagement of the peripheral surface of the wheel with one side of the vertical member. The apparatus includes at least two auxiliary wheels mounted on frame-supported horizontal axles at a location above the level of the axle of the positioning wheel, for rolling engagement with the opposite side of the vertical member and for limited movement toward and away from the axis of the vertical member, tensioning means biasing the auxiliary wheel axle toward the axis of the vertical member, and lever means for rotating the positioning wheel axle to rotate the positioning wheel in frictional engagement

with the surface of the vertical member and thereby adjust the height of the frame and of the person supported thereon.

More particularly, for the purpose of control in position along the vertical member, the apparatus includes first ratchet means operatively interconnecting a position control handle and the positioning wheel axle and includes also releasable clutch means and second ratchet means operatively interconnecting the frame and the positioning wheel axle. For the purpose of accommodating changes in circumference of the vertical member, the wheel-biasing tensioning means of the apparatus includes extensible and retractable means, a tension control handle, and ratchet means operatively interconnecting the tension control handle and the extensible-retractable means.

FIGS. 1 and 2 show, in side elevation and plan view, respectively, a preferred embodiment of apparatus according to this invention in operative juxtaposition to a tree trunk, pole, column or other generally cylindrical vertical member 10. Such apparatus comprises, as prominent features thereof, bucket seat 11, supporting frame 12 thereunder generally U-shaped (in plan), foot rest 13 with brace 14, and positioning wheel 15 centered on horizontal axle 16 between bearing-support members 17, 17', which closely flank the wheel and angle outward to join and extend along the end portions of the U-frame arms flanking the vertical member. The positioning wheel therebetween is in frictional engagement with one side of vertical member, to whose generally opposite sides are juxtaposed pair of auxiliary wheels 20, 20' mounted for free rotation on arms of V-shaped auxiliary frame member 22, which is carried at a higher level by swing arms 24 (only the left one being visible in FIG. 1) upstanding from horizontal pivots 25 at the ends of the respective arms of the U-shaped main frame.

FIG. 2 shows in broken lines the disengaging or open position of V-shaped auxiliary frame member 22. The left end of the auxiliary frame member (shown detached) is adapted to be detachably secured by linch pin 23 to the top end of left swing arm 24, and the right end of auxiliary frame member 22 is pivotally mounted at its right end on the top end of the right swing arm (not visible) for movement in substantially a horizontal plane. Also secured to the top ends of the respective swing arms are resilient tensioning means 26, 26' whose opposite ends are connected by control cables 27, 27' to a takeup drum in tension control assembly 60 provided with control handle 29, as shown in more detail in FIGS. 5 to 7. Position control handle 31, also shown on the right side of the apparatus, and clutch release handle 32 shown on the left side are shown, together with their related parts, in more detail in FIG. 3.

FIG. 3 shows, on an enlarged scale, positioning wheel 15 and related parts in sectional plan. The positioning wheel comprises hub 35 affixed to axle 16 and carrying pneumatic tire 36 with stem valve 37. Position control handle 31 (partly cut away) has conventional ratchet head 41 with its drive fitting pinned to positioning axle 16 and with reversing control lug 42 protruding on the outer side of the ratchet head. In its lowermost or fully forward position, the position control handle rests on stop 30. The axle passes in sequence through (and is

bearinged for rotation in) the right arm of frame 12, right and left-side bearing supports 17', 17 and the left arm of frame 12 and terminates in conventional ratchet adapter 46. The ratchet adapter is affixed to axle 16 and joins it to clutch assembly 50 mounted on the left arm of the frame. Safety wire 47 secures protruding ratchet reversing pin 48 from reversing (to the "down" direction).

The clutch assembly also may be of wholly conventional type (e.g., Formsprag Company, Warren, Michigan "Roto-Cam"). It comprises a plurality of clutch discs 51, one or more thereof being normally stationary with respect to its frame and one or more being rotatable. As connected the rotatable discs rotate with axle 16 through ratchet adapter 46. Preloading bias provided by disc-type or Belleville springs 52 at the outer end is transmitted in the engaged position of clutch release handle 32 to force the clutch discs into contact, thereby locking the clutch discs relative to one another and preventing interconnected axle 16 from turning. The handle controls the application of such force by limited rotation of cam ring 55, which controls the axial movement of bearings 56. Immediate release upon opposite positioning of the handle is assured by intervening smaller Belleville springs, which force the discs apart, whereupon axle 16 can turn. Any equivalent clutch mechanism may be substituted.

FIGS. 5, 6, and 7 show, on an enlarged scale, details of the tension control assembly 60 located at the operator's right between (and mostly below) position control handle 31 and bucket seat 11. Tension control handle 29 has ratchet head 61 with reversing control lug 62. Takeup drum 28 receives left-side control cable 27 (FIG. 1) from tensioning means 26 about pulley 66 (FIGS. 1 and 2) mounted obliquely at the left front corner of the frame and pulley 67, which is supported between angle bracket 64 bolted to the right front corner of frame 12 and angle bracket 65 bolted to the right front corner of the frame and transverse frame member 69. Right-side control cable 27' proceeds directly to the takeup drum from right tensioning means 26'. The respective cables and attached tensioning means are extensible and retractable through rotation of takeup drum 28. The takeup drum is affixed to shaft 68, which is pinned at one end to ratchet head 61 of tension control handle 29 and at the opposite end to the drive member of ratchet head 71 (which has reversing control lug 72) whose handle is cut off and bolted to right-hand frame member 12. The resilience of the tensioning means accommodates appreciable changes in the circumference of the vertical member, such as usually occur gradually with change in height. Of course, after substantial change in circumference thereof, the tension should be readjusted appropriately by extending or retracting the control cables.

Operation of this apparatus by a person seated thereon (sometimes called the climber, operator, or user) will be readily understood. It will be assumed that initially the apparatus is resting on the ground, with the auxiliary wheel axle assembly closed about a generally cylindrical vertical member to be "climbed." The operator ascertains that reversing control lug 62 on the tension control handle ratchet is set so that lifting the handle rotates shaft 68 and takeup drum 28 thereon and that reversing control lug 72 is set so that ratchet-

ing occurs (usually audibly apparent as a clicking noise) as the handle is lifted. Such action shortens the unwound part of tension control cables 27, 27' by winding end portions thereof onto the drum, which retains the wound portions because shaft ratchet head 71 acts to prevent the shaft from rotating in the opposite or unwinding direction. Resilient tensioning means 26, 26' are extended thereby, forcing auxiliary wheels 20, 20' toward the axis of the vertical member from the far side and, of course, also forcing positioning wheel 15 toward the axis from the near side. When the operator judges that enough tension has been applied to keep the tire of the positioning wheel in essentially non-slipping contact with the pole surface, he is ready to cause the tree seat to ascend.

Before ascending, the operator ascertains that clutch release handle 32 is in the set or locked position and that reversing control lug 42 of lifting position control handle 31 is set such that pumping the latter handle rotates positioning wheel 15 up the vertical member. Ratchet adapter 46 on axle 16 ratchets as the positioning control handle is lifted to rotate the wheel in the upward direction. Of course, ratchet head 41 on the position control handle ratchets when the operator pushes the handle down between successive lifting strokes.

In this manner the operator propels the tree seat, with himself thereon, as far up the vertical member as he wishes, or until the wheels encounter a substantially obstacle. The wheels will roll over knots or other slight enlargements by reason of the resilience of the tensioning means, which extend and retract accordingly.

When the operator wishes to descend, he reverses ratchet control lug 42 on the position control handle ratchet and then lowers clutch release handle 32, whereupon positioning wheel axle 16 is freed to rotate. Thereupon the weight of the apparatus and of the operator causes the apparatus to descend and the positioning wheel to retract its previous path. The positioning handle ratchet head ratchets (i.e., clicks) as the axle turns, while ratchet adapter 46 on opposite end of the axle rotates with it. Whenever the operator wishes to slow or stop the descent he can do so merely by raising the clutch release handle. Biasing of the clutch release handle to the upward position is effective to stop the descent if the operator should lose his grip on it. Because of its action in reducing speed of descent or bringing descent to a complete stop, the clutch assembly may be thought of as a brake mechanism.

If during a descent it becomes advisable, such as because of enlargement in circumference of the vertical member near its base, the tension on the tensioning means can be reduced quite easily. The operator can do this most simply by lifting slightly on tension control handle 29 so as to enable him to reverse control lug 72 on the ratchet head at the opposite side of the takeup drum, after which the tension will force the tension control lever forward and down against the grip of the operator. When the handle has moved sufficiently to relax the tension as desired, the operator then switches ratchet control lug 72 back to its initial position, whereupon he may release the tension control handle, which will not tend to move further. If the handle is in an awkward position he can move it, without affecting the tension, by reversing control lug 62 on the handle ratchet head and moving the arm to its desired position,

after which the control lug should be returned to its previous position.

The multiple safety features, such as are attained by the use of ratchets in series, as well as by the use of the indicated clutch, will become most apparent to those undertaking to practice the invention. Although a specific apparatus embodiment has been illustrated and described, modifications may be made therein, as by adding, combining, or subdividing parts or substituting equivalents, while retaining at least some of the benefits of the invention, which itself is defined in the following claims.

We claim:

1. In apparatus having means for supporting a person to ascend or descend a tree, pole, column or other cylindrical vertical member and having wheels carried on horizontal axes and frictionally engaging opposite sides of such vertical member, the improvement comprising lever means including a position control handle manually operable by the person so supported to rotate at least one of the wheels and thereby position such apparatus unassisted with himself thereon along the vertical member, and including also first ratchet means operatively interconnecting the lever means and one end of the positioning wheel axle, and second ratchet means operatively interconnecting the frame and the opposite end of the positioning wheel axle.

2. In apparatus for ascending and descending a tree, pole, column, or other generally cylindrical vertical member, a frame having means thereon for supporting a person, a positioning wheel mounted on a horizontal axle carried on the frame for frictional engagement of the peripheral surface of the wheel with one side of the cylindrical vertical member, at least two auxiliary wheels mounted on horizontal axes for rolling engagement with the generally opposite side of the cylindrical member, the auxiliary wheel axle being carried by the frame movably toward and away from the axis of the cylindrical member, at a location above the level of the axle of the positioning wheel, tensioning means biasing the auxiliary wheel axle toward the axis of the cylindrical member, and lever means for rotating the positioning wheel axle to rotate the positioning wheel in frictional engagement with the surface of the cylindrical member and thereby adjust the height of the frame and person supported thereon, including first ratchet means operatively interconnecting the lever means and one end of the positioning wheel axle and releasable clutch means and second ratchet means operatively interconnecting the frame and the opposite end of the positioning wheel axle.

3. In apparatus for ascending and descending a tree, pole, column, or other generally cylindrical vertical member, a frame having means thereon for supporting a person, a positioning wheel mounted on a horizontal axle carried on the frame for frictional engagement of the peripheral surface of the wheel with one side of the cylindrical vertical member, at least two auxiliary wheels mounted on horizontal axes for rolling engagement with the generally opposite side of the cylindrical member, the auxiliary wheel axle being carried by the frame movably toward and away from the axis of the cylindrical member, at a location above the level of the axle of the positioning wheel, tensioning means biasing the auxiliary wheel axle toward the axis of the cylindrical

cal member and comprising extensible and retractable means interconnected from the auxiliary wheel axles to part of the frame on the opposite side of the axis of the cylindrical member therefrom and a tension control handle for actuating the extensible-retractable means, and lever means for rotating the positioning wheel axle to rotate the positioning wheel in frictional engagement with the surface of the cylindrical member and thereby adjust the height of the frame and person supported thereon.

4. Apparatus according to claim 3, including ratchet means operatively interconnecting the tension control handle to the extensible-retractable means.

5. Apparatus according to claim 4, wherein there are two such ratchet means, both reversible, the first ratchet means being connected directly to the tension control handle, and the second ratchet means being connected between the first ratchet means and the extensible-retractable means and set to ratchet upon increase in tension.

6. Apparatus enabling a person to be self-propelled upward or downward along a tree, pole, column, or other generally cylindrical vertical member and comprising a frame having means thereon for seating a person facing away from the cylindrical member, a positioning wheel mounted on a horizontal axle carried on the frame for frictional engagement with one side of the cylindrical vertical member, a pair of auxiliary wheels mounted spaced apart on horizontal axes oriented at an obtuse angle to one another and carried by swing arms on the frame movable toward and away from the axis of the cylindrical member on the opposite side thereof from the positioning wheel axle and at a level above the axis of the cylindrical member for rolling engagement of the auxiliary wheels with the opposite side of the cylindrical member, tensioning means operatively interconnected to the swing arms to bias the auxiliary wheel axles toward the axis of the cylindrical member and thereby force the positioning wheel into essentially non-slipping frictional engagement with the cylindrical member, a manually actuable position control handle for so rotating the positioning wheel axle, reversible ratchet means operatively interconnecting the control handle to one end of the positioning wheel axle, irreversible ratchet means and manually actuable clutch means releasably interconnecting the opposite end of the positioning wheel axle to the frame.

7. In apparatus having a frame and means thereon for supporting a person to ascend or descend a tree, pole, column, or other cylindrical vertical member and having wheels carried on horizontal axes and frictionally engaging opposite sides of such vertical member, the combination of a position control handle manually operable by the person so supported to rotate at least one of the wheels and thereby raise such apparatus with himself thereon along the vertical member, first ratchet means interconnecting the lever means and the positioning wheel axle, and second ratchet means interposed between and operationally interconnected to the positioning wheel axle and the frame, the first ratchet means being reversible but the second ratchet means being unidirectional and adapted to retain rotation of the positioning wheel axle to raise the apparatus along the vertical member.

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8. Apparatus according to claim 7, including normally engaged clutch means interposed between the positioning wheel axle and operationally interconnected to the positioning wheel axle and the frame, but disengageable to nullify the second ratchet means.

9. Apparatus according to claim 8, including a handle manually operable to disengage the clutch means.

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10. Apparatus according to claim 8, wherein the first ratchet means is connected to one end of the positioning wheel axle, the second ratchet means is connected to the opposite end of the positioning wheel axle, and the clutch means is connected to the second ratchet means and the frame.

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