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(54) **Table.**

(57) A table for use with a recline chair or a like piece of furniture such as a lounge chair or even a bed enables the occupant to perform tasks such as reading, writing or even the use of computers or word processors. The table includes a relatively heavy T-shape base (10) with an adjustable height telescoping tubular vertical pedestal (11) extending from the intersection of the stem and head of the T. A convenient hand wheel (15) is provided readily to adjust the height of the upper vertically movable portion of the pedestal. Mounted on the height adjustable portion of the pedestal is a first or lower table surface (17) which is supported on a cantilever parallelogram linkage (16) so that it may be swung toward and away from the user through a limited swing arc without changing its front edge orientation with respect to the user. However, at the limit of such parallel orientation swinging away from the user the proximal connection of the linkage to the pedestal is released so that the entire table assembly including the supporting linkage may be swung approximately 45° about the vertical axis of the pedestal to clear the area above the chair. Such first or lower table surface may be tilted about its front toward or away from the user and locked in the desired tilt position. At the edge closest to the user the surface includes a rotating rail (150) which in one position provides a tray or stop surface to hold books, papers, pads, pencils, or even a keyboard from sliding or rolling into the lap of the user. On top of the pedestal there is provided another table surface or tray (19) which may be rotated about a vertical axis on the end of a swinging arm. Such tray may support, for example, a video display or it may be omitted or replaced entirely by a lamp.

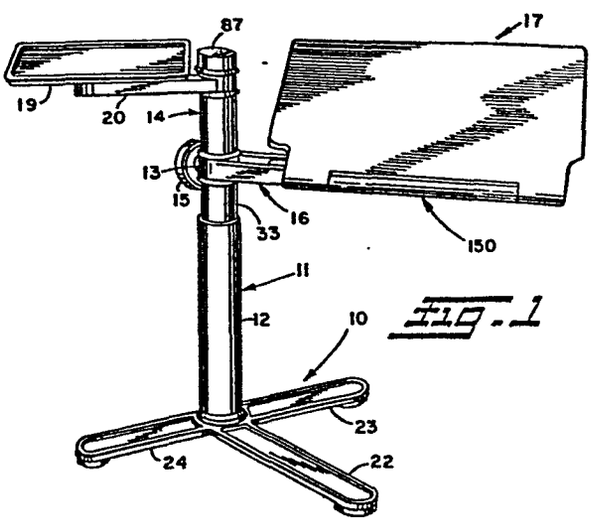

Fig. 1

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TABLE

This invention relates generally as indicated to a table and more particularly to a table for use with an item of furniture such as a recline chair or lounge chair.

BACKGROUND OF THE INVENTION

It has been indicated that people tend to accomplish certain tasks more easily and readily in a comfortable position. Thus, typically, usual chair-desk or chair-table positions are not necessarily an ideal position in which readily to accomplish tasks such as reading, writing or even utilizing a computer or word processor. In applicant's copending application entitled "Recline Chair", filed even date herewith, there is shown and described a task chair which is really in the form of a recline or lounge chair in which tasks such as reading, writing or even computer operation may readily be performed.

However, specialized tables or work surfaces need to be provided. Such work surfaces should be height adjustable and should be readily positionable at or near the hand level of the user or slightly above the arms of the chair. If a video display terminal is utilized in connection with such tasks, the video display terminal should be supported at approximately eye level. The primary work surface should tilt about its forward edge or the edge nearest the user since the user may be in a reclined or partly reclined position. Moreover, such surfaces should be movable toward and away from the user and readily movable to and from a position over the chair or like item of furniture to permit the user readily to get into and out of the chair. Reference may be had to applicant's copending application entitled "Lamp", filed even date herewith for an illustration of a lamp including a table surface, which lamp and table may readily be positioned or repositioned in cantilever fashion over the user.

SUMMARY OF THE INVENTION

The present invention provides a table or like item of furniture with one or more surfaces for use with a recline chair or like piece of furniture such as a lounge chair or even a bed. The table surfaces enable the occupant to perform tasks such as reading, writing or even the use of computers or word processors. The table includes a relatively heavy T-shape base with an adjustable height telescoping tubular vertical pedestal extending from the intersection of the stem and head of the T. A convenient handwheel is provided readily to adjust the height of the upper vertically movable portion of the pedestal. Mounted on the height adjustable portion of the pedestal is a first or lower table surface which is supported on a cantilever parallelogram linkage so that it may be swung toward and away from the user through a limited swing arc without changing its front edge orientation with respect to the user.

However at the limit of such parallel orientation swinging away from the user the proximal connection of the linkage to the pedestal is released so that the entire table assembly including the supporting linkage may be swung approximately 45° about the vertical axis of the pedestal to clear the area above the chair. Such first or primary work surface may be tilted toward or away from the user without increasing or decreasing the height of the front edge. Such surface may be locked in the desired tilt position. At the front edge or the edge closest to the user the surface includes a rotating rail which in one position provides a tray or stop surface to hold books, papers, pads, pencils, or even a keyboard from sliding or rolling into the lap of the user. On top of the pedestal there is provided another table surface or tray which may be rotated about a vertical axis on the end of the swinging arm. Such tray may support, for example, a video display terminal or it may be omitted or replaced entirely by a lamp.

In this manner there is provided height adjustable surfaces supported in cantilever fashion over the user with one surface being at approximately hand level while the other surface is at approximately eye level. Both surfaces may readily be placed in or removed from an operative position over or in front of the user.

To the accomplishment of the foregoing and related ends the invention, then, comprises the features hereinafter fully described and particulary pointed out in the claims, the following description and the annexed drawings setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principles of the invention may be employed.

BRIEF DESCRIPTION OF THE DRAWINGS

In said annexed drawings:

Figure 1 is a perspective view of a table in accordance with the present invention;

Figure 2 is a side elevation of such table on a somewhat enlarged scale;

Figure 3 is a top plan view of the lower work surface as seen substantially from the line 3-3 of Figure 2;

Figure 4 is an enlarged fragmentary vertical section through the front or leading edge of the primary work surface as taken from the line 4-4 of Figure 2;

Figure 5 is a somewhat enlarged vertical section taken substantially on the line 5-5 of Figure 2;

Figure 6 is fragmentary top plan view of such primary work surface with parts thereof broken away as seen from the lines 6-6 of Figure 5;

Figure 7 is an enlarged fragmentary horizontal section taken substantially on the line 7-7 of Figure 2 through the pedestal;

Figure 8 is an enlarged vertical section taken substantially on the line 8-8 of Figure 7, with the pedestal release plunger rotated out of its normal position;

Figure 9 is an enlarged longitudinal section of a preferred recline mechanism; and

Figure 10 is an enlarged transverse section seen from the line 10-10 of Figure 9.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings and initially to Figure 1, it will be seen that the table of the present invention includes a T-shape base shown generally at 10 with an upstanding vertical pedestal 11 projecting vertically from the intersection of the head and T of the base. The pedestal includes a lower fixed tubular portion 12 and an upper vertically movable parallel arm pivot base 13 above which is an optional tubular extension 14. Vertical movement of the arm pivot base and the upper tubular portion 14 may be obtained through handwheel 15.

Projecting in cantilever fashion from the pivot base 13 is a parallelogram linkage seen generally at 16 which in turn support in cantilever fashion a first lower or primary work surface seen at 17. An upper generally square or round tray or surface 19 is supported for rotational movement on a vertical axis on the end of swing arm 20 mounted on upper pedestal section 13.

Referring now additionally to Figures 2 and 3, it will be seen that the base 10 is in the form of a fairly heavy T-shape frame which includes a fairly long center leg 22 which forms the stem of the T and two somewhat shorter lateral legs 23 and 24, such legs together forming the head of the T. Optionally, it will be appreciated that the pedestal may be secured to the base by suitable fasteners extending from the bottom of the base through a plate welded to the bottom of the pedestal.

The pedestal 11 projects vertically from the intersection of the head and the stem of the T. The base includes an upwardly extending externally threaded hub 26 which is threaded into internally threaded ring 27 secured to the lower end of the outer tubular section 12 of the pedestal. This threaded connection supports the section 12 in upright position.

The hub includes integrally formed therewith upstanding portion 28 which is square in section and over which is telescoped the lower end of square-in-section tube 29. The two parts are held together by a suitable retaining fastener 30. Also, as indicated, a vertical hole seen at 31 extends through the round and square parts of the hub so that electrical wiring may pass therethrough.

The upper vertically movable portion 13 of the post or pedestal includes a lower tubular section 33 which telescopes closely within the fixed tubular section 12. Secured to the lower end of the movable tubular section 33 is a horizontal plate 34 which includes a square aperture accomodating the square tube 29. Suitable plastic sleeve bearings may be provided on the interior of the upper end of the fixed tube 12 as indicated at 36 and on the exterior of the movable tube 33 as indicated at 37. In this manner the movable tube 33 may slide vertically within the outer or fixed tube 12, but not rotate in relation to 12 or base 10.

Relative vertical movement of the two tubes is accomplished through jack screw 40 which extends downwardly through nut assembly 41 mounted on top of the inner square tube 29. The jack screw is driven for rotation by the relatively large hand wheel 14.

Referring now additionally to Figures 7 and 8, it will be seen that the upper end of the movable tubular element 33 has welded to the interior thereof a threaded ring 43 provided with internal threads thread connected to external threads on annular lower extension 44 of spacer ring 45. The spacer ring 45 includes an external annular shelf or flange 46 and is closed internally at its bottom above the extension 44 by annular plate 47. The upper end of the spacer ring 45 is externally threaded as indicated at 48 which is thread connected to ring 49 welded to the interior of spacer tube 50 which is the same diameter and wall thickness as the vertically movable lower tube 33.

Mounted on the exterior of the spacer ring 45 is a collar 52 which includes top and bottom plates 53 and 54. Such plates may be provided with plastic trim covers 55 as seen in Figure 2 and also are provided with diametrically opposed laterally projecting ears seen at 56 and 57 between which are pivoted as indicated at 58 and 59 tubular links 60 and 61, respectively, which form the parallelogram linkage 16. The collar assembly 52, 53, 54, may rotate on the spacer ring 45 through certain limits and under certain conditions, together with the arms 60 and 61.

Normally, the collar assembly is held against rotation on the spacer ring because of the engagement of the tip of plunger or shot pin 62 in hole 63 in such collar. The plunger extends diametrically through the spacer ring and is urged outwardly or to locking position by compression spring 64 extending between the interior of the spacer ring and stop collar 65. The opposite end of the plunger fits in hole 66. A further stop ring 67 is provided on the plunger as indicated at 67 limiting the extent of movement of the plunger as a result of the force of the spring 64. On the side of the spacer ring between the arms 60 and 61 the plunger extends through hole 70 in such spacer ring . As indicated in Figure 7, the interior of the arm 61 includes a button 71 which when the arm is moved forwardly or upwardly in Figure 7, engages the tip of the plunger 62 depressing the plunger against the pressure of spring 64. In this manner the tip 62 moves out of the hole 63 and the collar assembly 52 is then free to rotate on the spacer ring.

Also, as seen in Figure 8, the hand wheel 14 is secured to a shaft 73 which is in turn secured to cross shaft 74 extending diametrically of the spacer ring on which bevel gear 75 is secured. The bevel gear 75 is in mesh with bevel gear 76 secured to vertical shaft 77, journaled through plate 47 as indicated at 78 and secured through coupling 79 to the jack screw 40. It is noted that the shaft 73 extends through a horizontal arcuate slot 80 in the collar 52 permitting the collar to rotate with respect to the spacer ring. Such slot may extend 45° on each side of the shaft and its ends constitute swing stops for the collar 52. It is noted that diametrical holes 66 and 70 may be duplicated at 90° so that the assembly may readily be converted from a right hand to a left hand operation, and vice versa.

Reverting back to Figure 2, it will be seen that the tubular extension 50 of the vertically movable portion 13 of the pedestal is provided with an internally threaded ring at its top indicated at 82 threaded to the exterior of a spacer ring 83. The ring 83 is similar to the spacer ring 45 and collar 84 is

journaled [illegible] in plastic trim bearings 85 and 86. A cap [illegible] on top of the pedestal and it may be provided with a depending annular portion internally threaded to engage an externally threaded portion of the top of the spacer ring 83. Optionally, the cap 87 may be screwed to the top of spacer ring 83 thereby omitting the entire upper assembly 13, etc.

Plastic trim bearings 85 and 86 may be the same as the bearing 36 and are annular and L-shape in section with the short horizontal leg being provided with the indicated bead.

Secured in the collar 84 is the swing arm 20 for the tray or surface 19. The tray illustrated is essentially square in planar configuration, although it may be round or of another configuration, and may be provided with an annular upstanding lip indicated at 88. The tray includes a center downwardly projecting hub 89 which includes a projecting pintle or pin 90 journaled in the outer or distal end of the arm 20 and retained by snap ring 91. A suitable plastic thrust bearing is secured by the fastener seen to the lower end of the hub and provides a thrust bearing between the top of the outer end of the arm and the underside of the hub. In any event, the tray or surface 19 may be rotated about the vertical axis of the pin 90 and the arm 20 may be swung horizontally about the axis of the pedestal. Suitable stops, not shown, may be provided to limit the swinging of the arm 20 since the tray may support relatively heavy objects such as a video display terminal.

In any event, the entire upper portion of the pedestal may be moved vertically by rotating the hand wheel 14 which in turn rotates the jack screw 40 mounted in the nut 41 at the top of the square tube 29. As seen in Figure 2, a spring steel stop 94 may be provided in the square tube projecting outwardly which is adapted to engage the top surface of the plate 34 limiting the vertical extent of movement of the upper portion of the pedestal.

Referring now additionally to Figures 3, 5 and 6, it will be seen that the outer end of the parallel cantilever arms 60 and 61 are pivoted at 96 and 97 between vertically spaced ears 98 and 99 projecting from plate 100 secured to the side of square tube

102 by suitable fasteners 103 projecting both through the tube and optional plate 104 on the opposite side of the tube. The square tube 102 at its forward end is secured as by welding to circular tube 105 which extends across the front edge of the work surface 17. The two tubes 102 and 105 are the principal structural elements supporting the work surface 17. The work surface 17 is preferably of a light weight structural foam plastic construction.

In order to rigidify the work surface, the underside may be provided with parallel ribs seen at 109 and 110 at each side of the surface with the inner of the parallel ribs being interconnected by the X-shape ribbing seen at 111. This symmetrical configuration of the table or work surface permits the work surface to be utilized in either a right-handed or left-handed situation simply by removing it from the tube 105 and turning it end for end. In an opposite handed situation the square tube would be turned over and extend in the opposite direction or upwardly in Figure 3 with the round tube extending in the same direction to the right.

The parallel ribs 109 and 110 closest to the arms 60 and 61 provide a slot or housing for an incline mechanism shown generally at 113. Such incline mechanism includes an actuator knob or paddle 115 mounted on offset end 116 of crank arm 117 which includes a hub 118 secured by pin 119 to the end of shaft 120. The shaft is journaled for rotation in bearing housings 121 and 122 at each end removably secured between the ribs 109 and 110. It is noted that special screw inserts may be provided between both pairs of ribs for this purpose as seen at 123 in Figure 3, this again facilitating conversion of the table to an opposite handed situation. A coil spring 124 surrounds the shaft 120 between the bearing housing 122 and the hub 118 urging the shaft to its engagement or lock position of rotation. Compressing the paddle 115 will rotate the shaft against the pressure of the spring to its release position.

Such shaft 120 may comprise a screw having two flattened or unthreaded diametrically opposed sides. Such shaft fits through a nut assembly 126 which may have two thread parts diametrically spaced. In one position of rotation of the shaft 120 the threads

of the shaft will engage the threads of the nut. However, when the paddle 115 is depressed rotating the shaft about its axis, the threads on the shaft will clear the threads in the nut assembly enabling the work surface to be pivoted about the axis of the tube 105.

The nut assembly 126 is pivotally mounted on the distal ends of arms 130 and 131. The proximal end of such are arms are secured to a sleeve 132 mounted on shaft 134 extending from plates 104 and 100 beneath the parallel ribs 109 and 110 forming the incline mechanism housing.

As seen more clearly in Figure 5, the work surface 17 may pivot to the phantom line position indicated generally at 140 through the arc 141 with the incline mechanism holding the work surface in its desired inclined position. The work surface may readily be returned to its horizontal position simply by again actuating the paddle 115 to rotate the shaft 120.

The tilt or pivot location for inclining the work surface 17 is, of course, the axis of the tube 105. As seen more clearly in Figure 3, the work surface includes forwardly projecting laterally spaced hub portions 145 and 146 which form a well or recess at the forward edge of the work surface indicated at 147. The recess accomodates a rotatable rail stop indicated generally at 150. The work surface may readily be assembled on the tube 105 simply by mounting the work surface over the tube with the rail stop 150 assembled between the hubs 145 and 146. A suitable snap spring indicated at 151 may be provided to hold the parts thus assembled.

As seen more clearly in Figure 4, the rail stop includes a circular plastic sleeve which includes an open slot seen more generally at 153. The sleeve includes two triangular projections indicated at 154 and 155 both of which include radial surfaces seen at 156 and tangential surfaces seen at 157. In one position of rotation the projection 155 moves to the phantom line position 160 and in such position creates a shelf or stop 161 precluding

items on the work surface from rolling off or sliding toward the lap of the user. It is noted that the inside surface of the recess 147 is curved to accomodate rotation of the projecting point of the other projection 154 which when the rail stop is rotated, forms a continuation of the top surface of the work surface 17. To assure rotation of the rail stop to the exact positions, each hub 145 and 146 includes an inwardly projecting stop 164 which includes opposed radial surfaces 165 and 166 adapted to abut the rounded edges 167 and 168 of the slot 153. In this manner the surface of the two triangular projections are positioned in precisely the desired location. Spring detents 169 seen in Figures 3 and 6 at each end of the rail cooperate with the dimples 170 seen in Figure 4 to hold the rail in its alternate positions.

Also referring to Figures 3, 5 and 6, it will be seen that the top or rear edge of the work surface may be provided with one or more spring clips indicated generally at 171. As seen more clearly in Figure 5, such clips may include a mounting clasp 173 securing the same to the beaded edge 174 of the far or upper end of the surface 17. The mounting clasps include upstanding ears 175 between which are pivoted the ears 176 of spring loaded paddles 177. Thus, simply by asserting a thumb pressure on the roughened projecting end 178, the clips may be opened to secure by means of the spring pressure papers or other items beneath the inwardly projecting edge 179 on the opposite end of the spring loaded paddle.

It will be appreciated that the pivots for the parallelogram linkage 60 and 61 are provided with a desired friction so that the work surface 17 may not freely move fore and aft of the user. In any event, when the work surface 17 is pushed away from the user,the button 71 will depress the plunger 62 permitting the surface to be pivoted to the phantom line position indicated at 182 in Figure 3. This permits the user of the recline chair or like item of furniture readily to enter or leave such chair.

In Figures 9 and 10 there is illustrated an alternative preferred recline mechanism which comprises a fast thread screw 200 journaled at the forward end of the table 17 between opposed thrust bearings 202 and collars 203 and held in place by bearing block 204. The fast thread screw has a relatively coarse thread of high pitch. The opposite or outer end of the screw is journaled in bearing block 205 which also includes a pivot 206 for release lever 207. The screw extends beyond the bearing block and into the brake block 209.

As seen perhaps more clearly in Figure 10, the brake block includes a somewhat vertically elongated opening 211 which accomodates an aluminum collar or brake drum 212 mounted on the outer end of the screw. The upper end of the opening has secured thereto a rubber brake lining 213 which normally embraces and engages the brake drum 212. The brake lining is normally urged into engagement with the brake drum by two compression springs 215 and 216 extending between the underside of the table and the brake block. The springs however may be compressed by release lever 207 which extends through slot 217 in the bottom of brake block 209 and projects beyond the bottom of the outer edge of the table. In this manner, the brake block may be lifted to free the screw for rotation.

The screw includes a nut or threaded block 220 having the same fast internal threads, to which is pivoted the support arms 130 and 131. The top of the threaded block is provided with a TEFLON or like slider pad which rides against the underside of the table 17 between the ribs 109 and 110. In any event, it can be seen that the tilt angle of the table can manually be adjusted to the desired angle as long as the brake mechanism is released. The manual adjustment of the table will rotate the screw when it is free to rotate. As soon as the lever 207 is released, the screw will be locked against rotation holding the table in the desired angle of inclination.

It is noted, the height adjustment of the table permits the user to position both surfaces for convenience. For example, the

lower surface may be positioned at hand or arm level, which may be just above the arms 230 and 231 of the chair seen in Figure 2, and the upper surface just below or essentially even with eye level seen at 232.

In Figures 9 and 10 there is illustrated an alternative preferred recline mechanism which comprises a fast thread screw 200 journaled at the forward end of the table 17 between opposed thrust bearings 202 and collars 203 and held in place by bearing block 204. The fast thread screw has a relatively coarse thread of high pitch. The opposite or outer end of the screw is journaled in bearing block 205 which also includes a pivot 206 for release lever 207. The screw extends beyond the bearing block and into the brake block 209.

As seen perhaps more clearly in Figure 10, the brake block includes a somewhat vertically elongated opening 211 which accomodates an aluminum collar or brake drum 212 mounted on the outer end of the screw. The upper end of the opening has secured thereto a rubber brake lining 213 which normally embraces and engages the brake drum 212. The brake lining is normally urged into engagement with the brake drum by two compression springs 215 and 216 extending between the underside of the table and the brake block. The springs however may be compressed by release lever 207 which extends through slot 217 in the bottom of brake block 209 and projects beyond the bottom of the outer edge of the table. In this manner, the brake block may be lifted to free the screw for rotation.

The screw includes a nut or threaded block 220 having the same fast internal threads, to which is pivoted the support arms 130 and 131. The top of the threaded block is provided with a TEFLON or like slider pad which rides against the underside of the table 17 between the ribs 109 and 110. In any event, it can be seen that the tilt angle of the table can manually be adjusted to the desired angle as long as the brake mechanism is released. The manual adjustment of the table will rotate the screw when it is free to rotate. As soon as the lever 207 is released, the screw will be locked against rotation holding the table in the desired angle of inclination.

It is noted, the height adjustment of the table permits the user to position both surfaces for convenience. For example, the

lower surface may be positioned at hand or arm level, which may be just above the arms 230 and 231 of the chair seen in Figure 2, and the upper surface just below or essentially even with eye level seen at 232.

CLAIMS

1. A cantilever table for a recline chair and the like comprising support means (11), a work surface (17) mounted on said support means adapted to be supported in cantilever fashion over such recline chair and the like, and means (16) to move said work surface with respect to said support means to clear the area over such recline chair and the like.

2. A table as set forth in claim 1 wherein said support means comprises a single vertical tubular post, and a collar (13) mounted on said post for rotation, said work surface being mounted on said collar.

3. A table as set forth in claim 2 including means (71, 62) responsive to a force exerted on such work surface to move it away from the user to release said collar for rotation.

4. A table as set forth in claim 3 including means (80) to limit rotation of such collar when released.

5. A table as set forth in claim 4 including height adjustment means for said collar and thus such work surface, said height adjustment means including a drive shaft (73) projecting through said collar, and a horizontal slot (80) in said collar accomodating said shaft and limiting rotation of said collar.

6. A table as set forth in claim 5 including a spring loaded shot pin (62) projecting through a hole in said collar, and means (71) on one of said link means operative to engage said pin to release it from said hole.

7. A table as set forth in claim 2 including parallelogram link means (16) supporting said work surface on said collar.

8. A table as set forth in claim 7 wherein said work surface is supported on an L-shape frame, one leg (105) of said frame being tubular and supporting said work surface for tilting movement about its front edge.

9. A table as set forth in claim 8 wherein the other leg of said frame is connected to said parallelogram link means.

10. A table as set forth in claim 8 including a rotating rail mounted on said tubular leg, and means to rotate said rail between alternate positions, one forming a continuation of the work surface, the other forming a stop tray at the front edge of such work surface.

11. A table as set forth in claim 1 wherein said support means comprises a vertically extending two-part pedestal, one part being height adjustable with respect to the other, said work surface extending in cantilever fashion from said one part.

12. A table as set forth in claim 12 including a second surface supported on said one part.

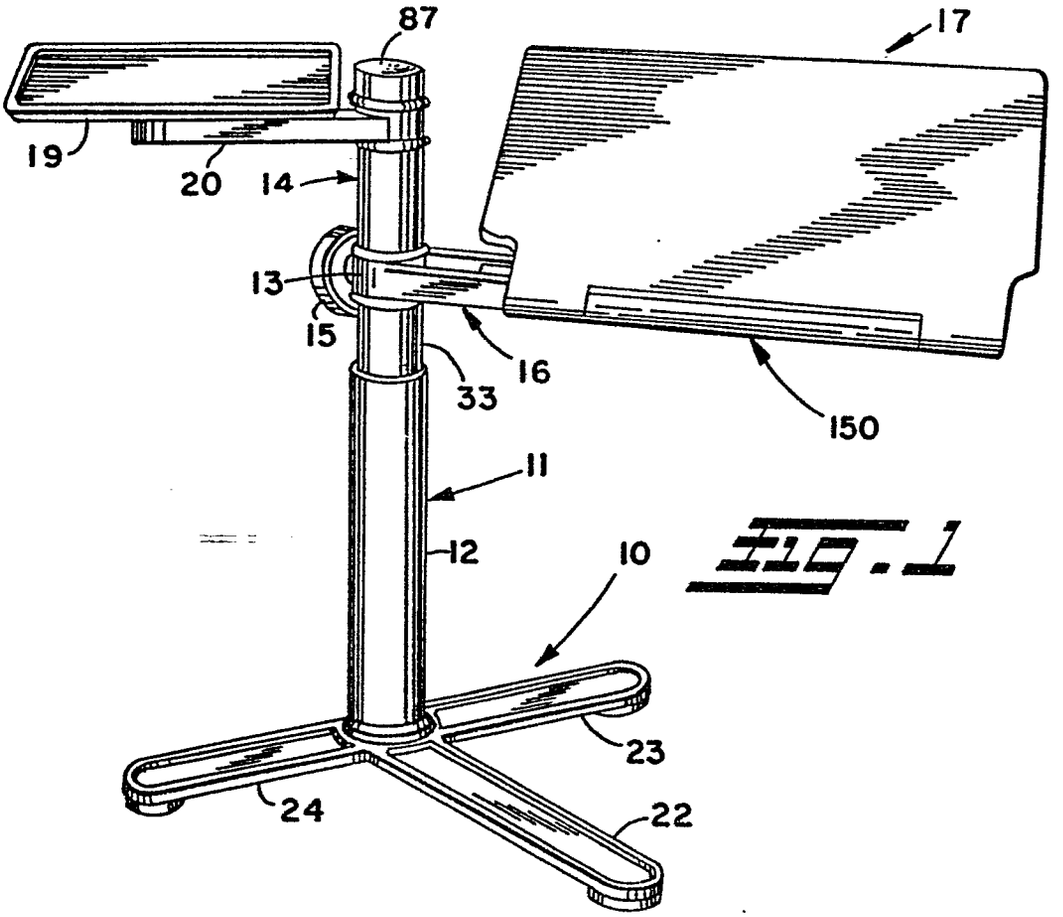
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Fig. 1

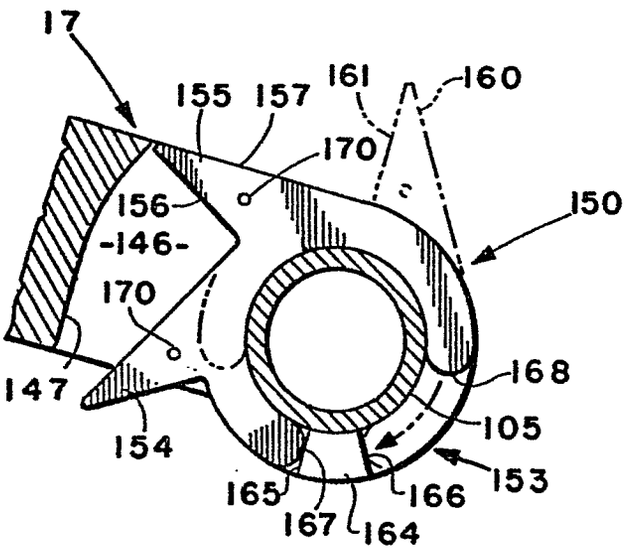
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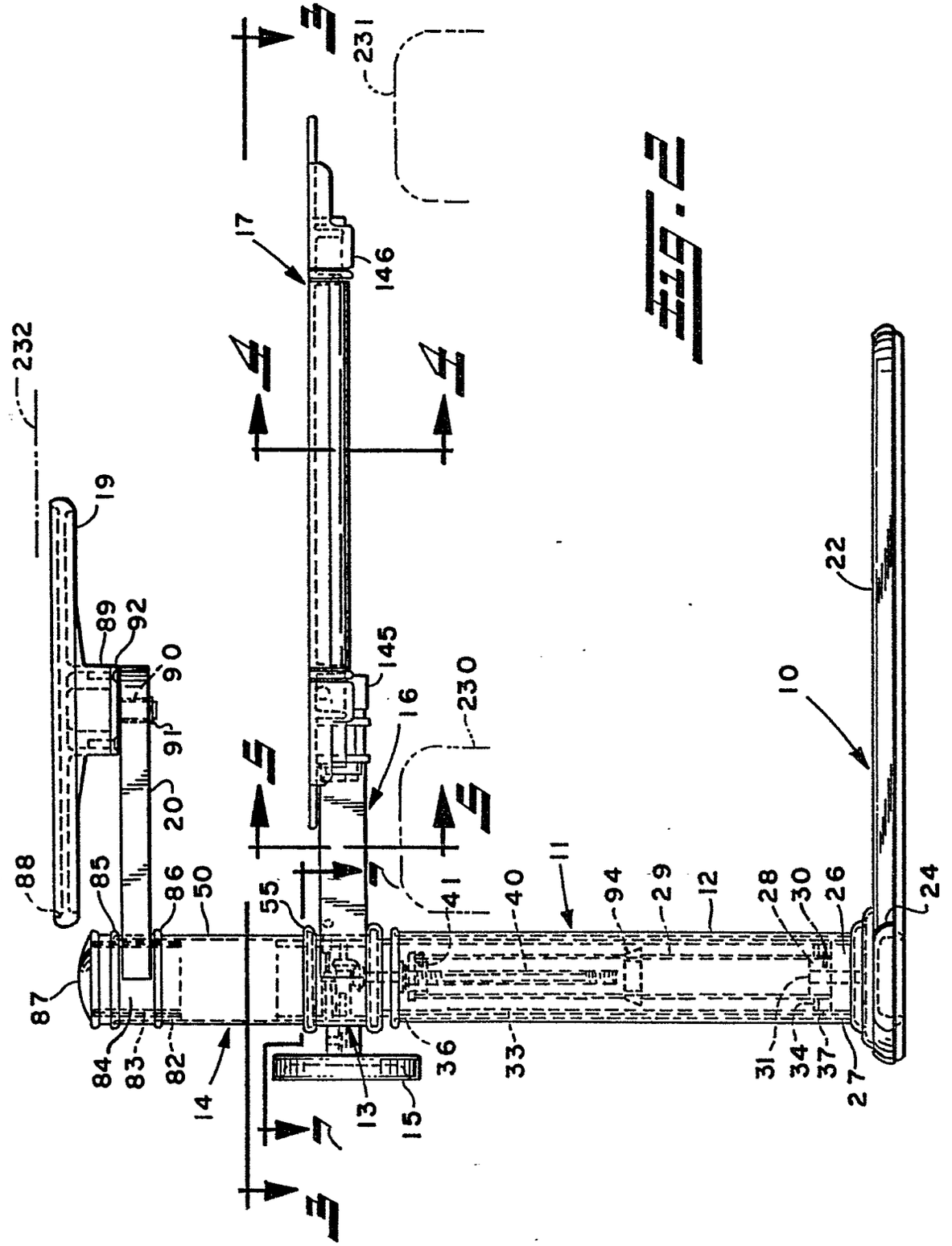
Fig. 4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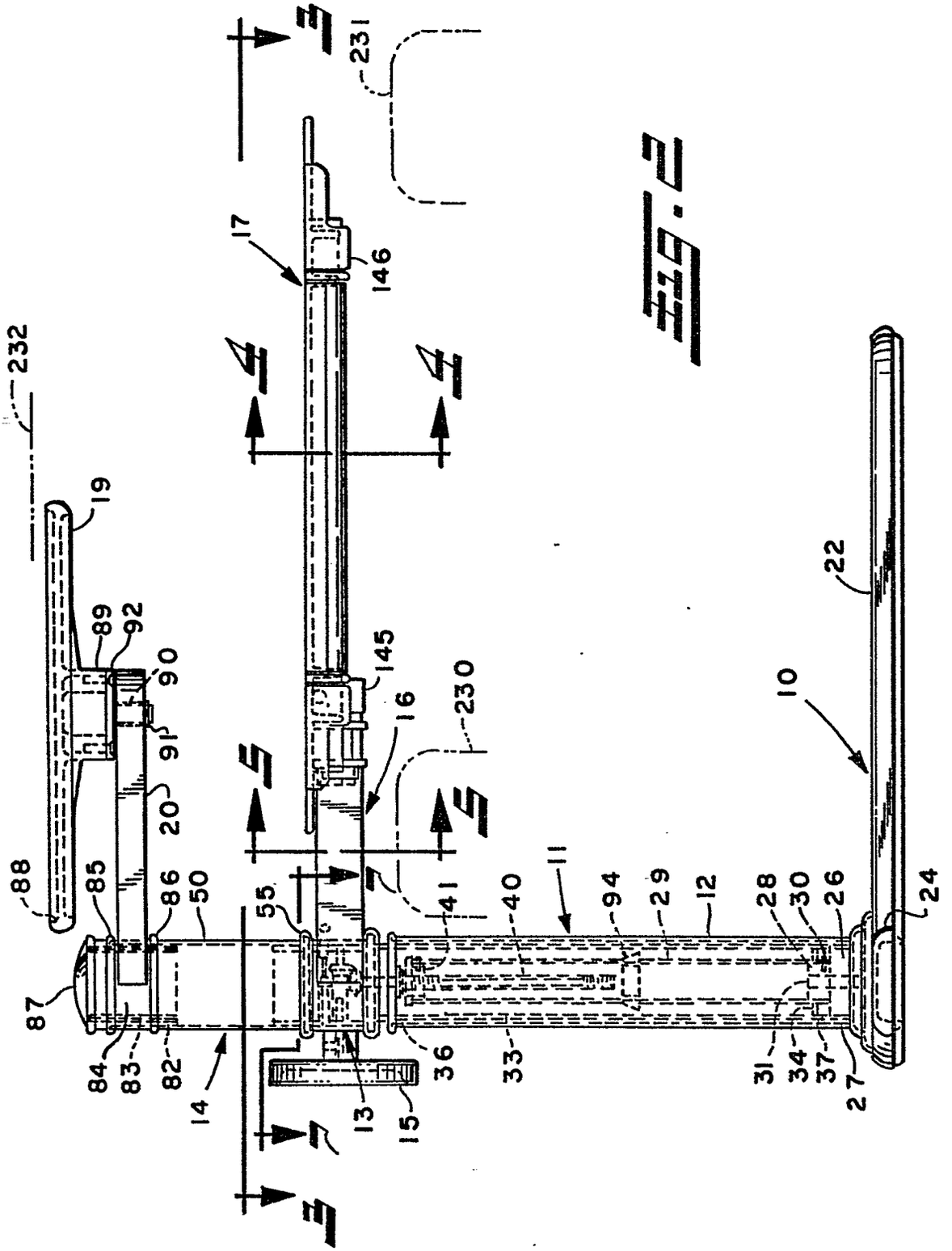
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FIG. 2

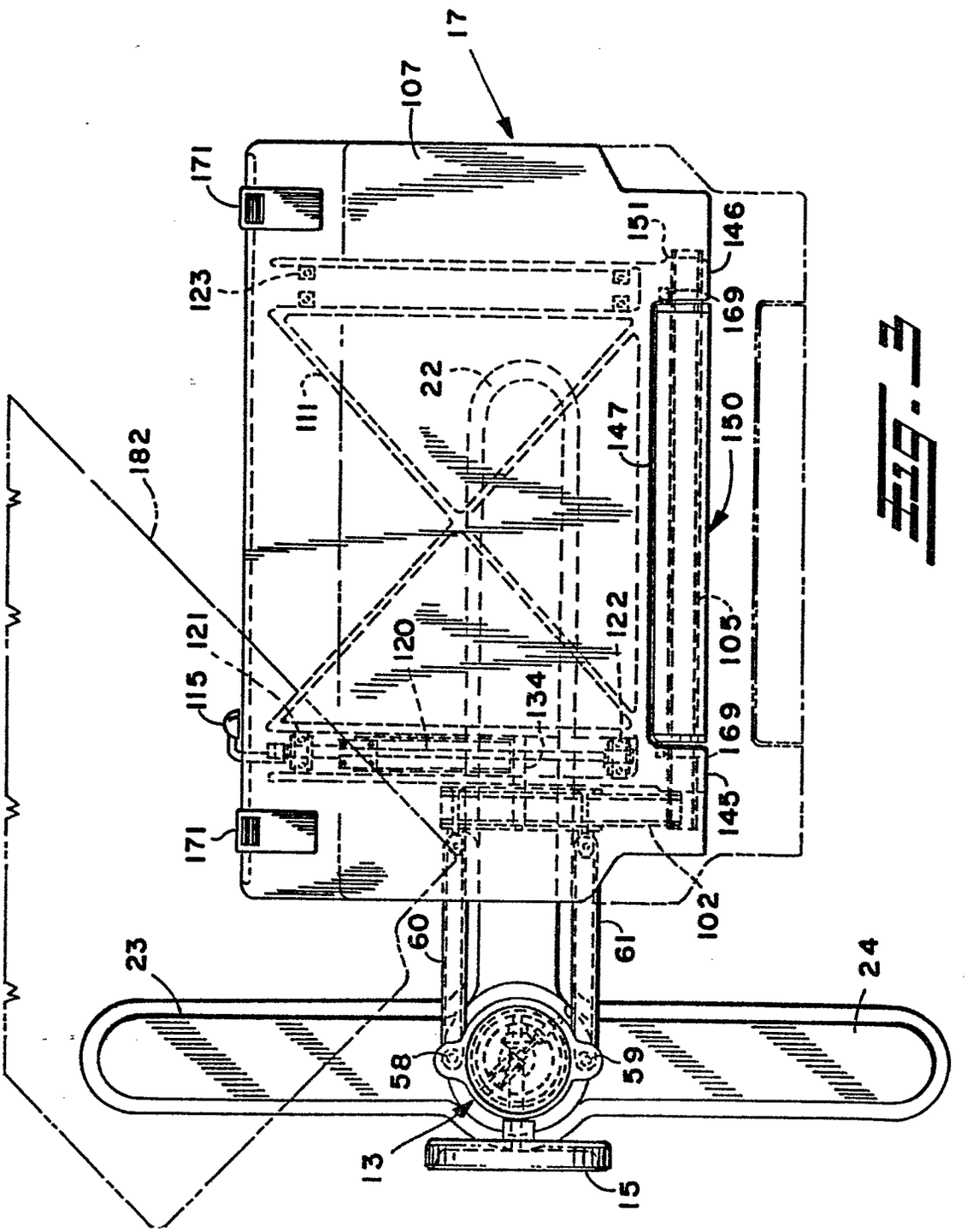
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FIG. 2

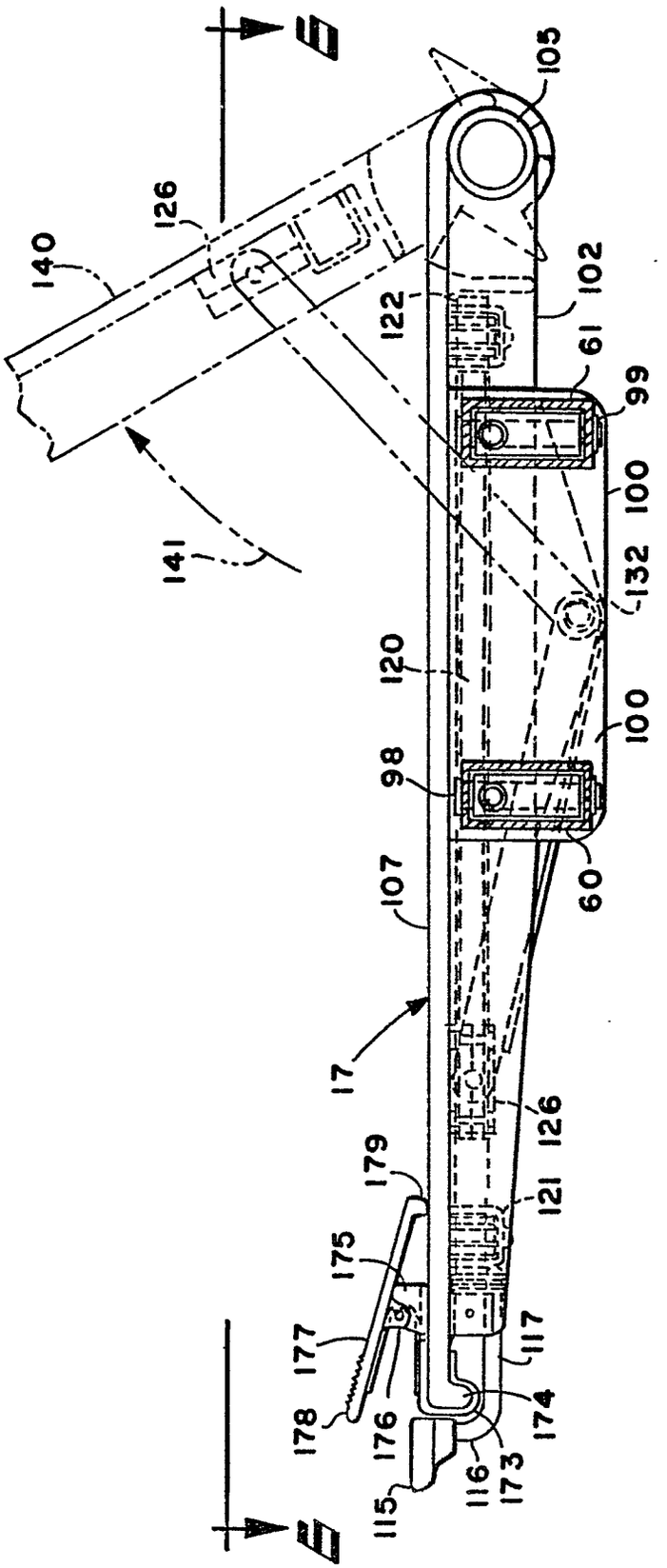
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FIG. 5

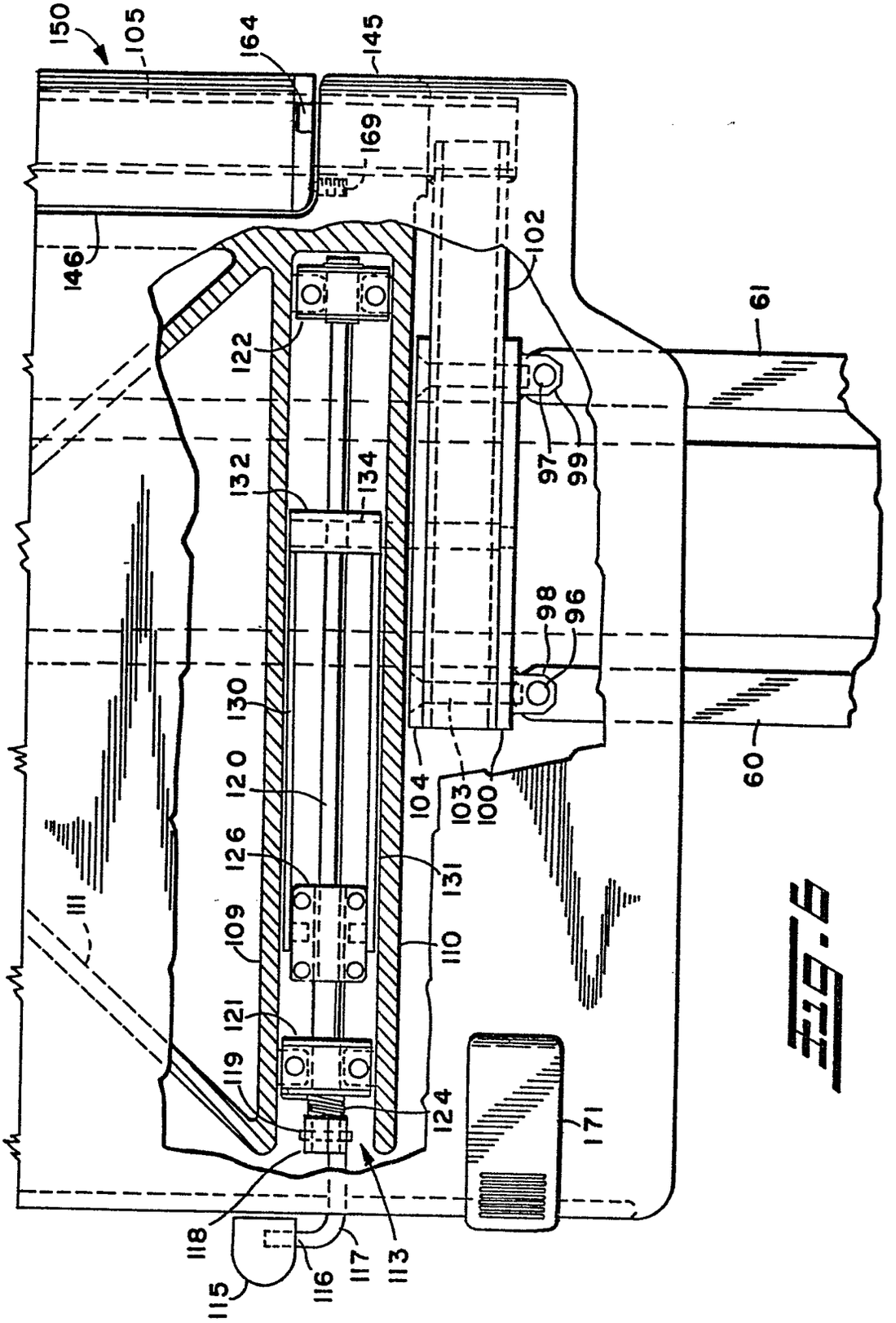
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FIG. 5

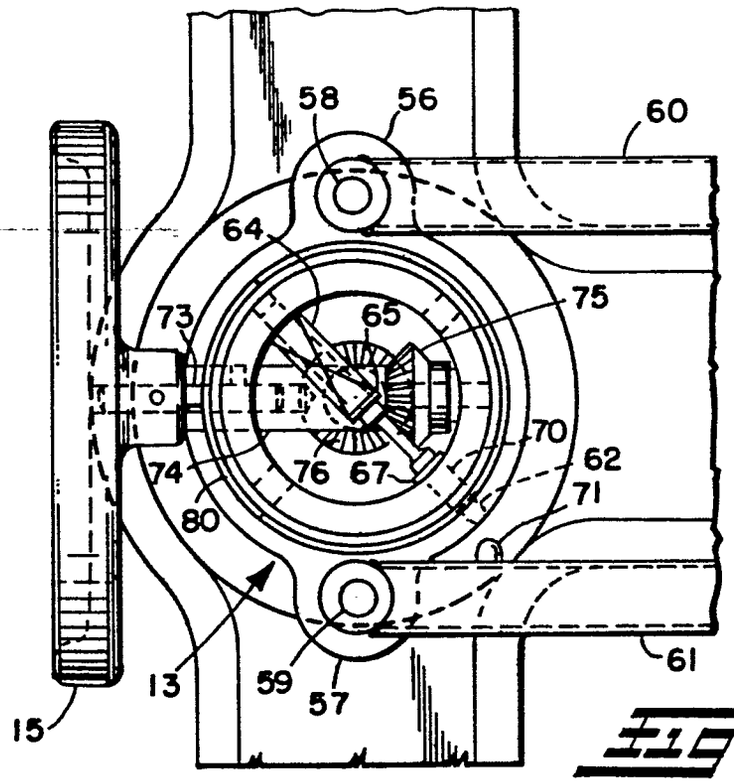
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Fig. 7

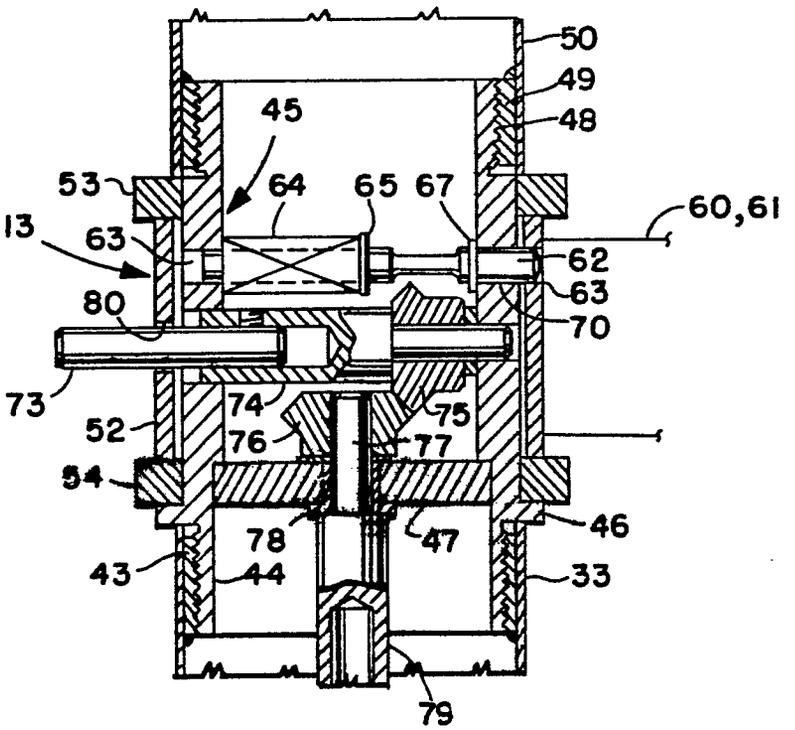
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Fig. 8

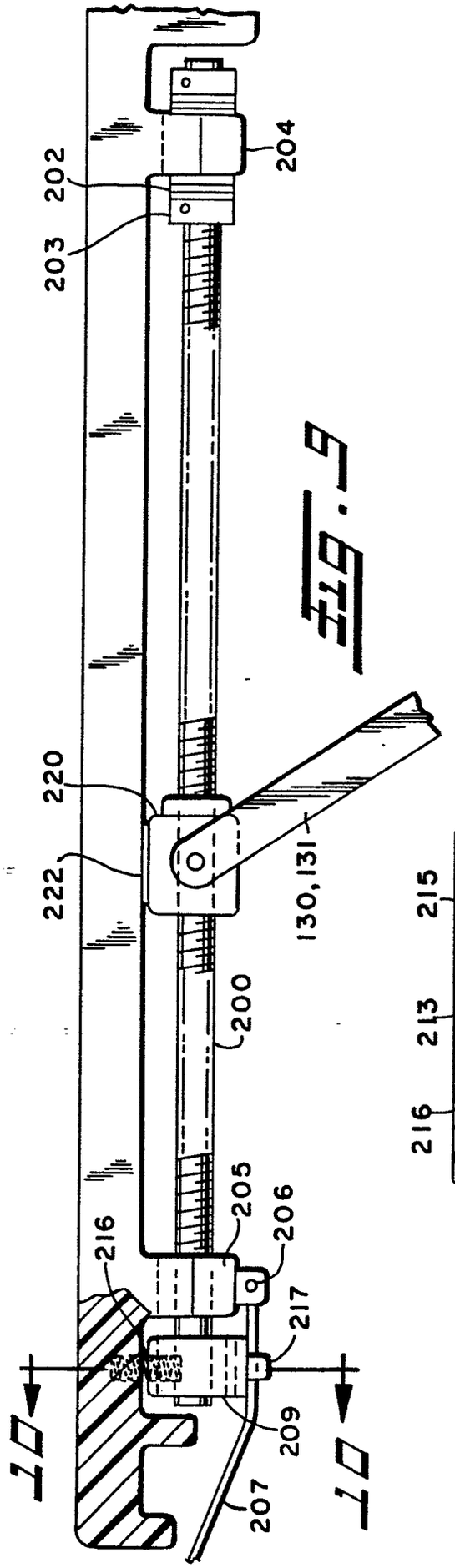
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FIG. 9

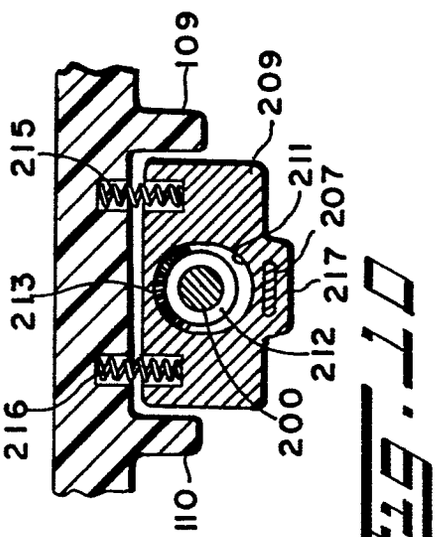
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FIG. 10