United States Patent [19]

Ré

[11] E **Re. 29,483**

[45] Reissued * **Nov. 29, 1977**

[54] **RECLINING CHAIR**

[75] Inventor: **Frank Manuel Ré**, Holyoke, Mass.

[73] Assignee: **Dual Manufacturing and Engineering, Incorporated**, Holyoke, Mass.

[*] Notice: The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.

[21] Appl. No.: **773,054**

[22] Filed: **Feb. 28, 1977**

Related U.S. Patent Documents

Reissue of:

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Issued: **Apr. 1, 1975**
Appl. No.: **307,176**
Filed: **Nov. 16, 1972**

U.S. Applications:

[62] Division of Ser. No. 222,563, Feb. 1, 1972, Pat. No. 3,758,151, which was reissued as Ser. No. 435,461, Jan. 22, 1974, Pat No. Re. 28,210.

[51] **Int. Cl.**[2] **A47C 1/02**
[52] **U.S. Cl.** **297/88**; 297/318
[58] **Field of Search** 297/318, 322, 323, 317, 297/316, 88, 28, 38, 87, 68, 85, 84, 254; 5/47

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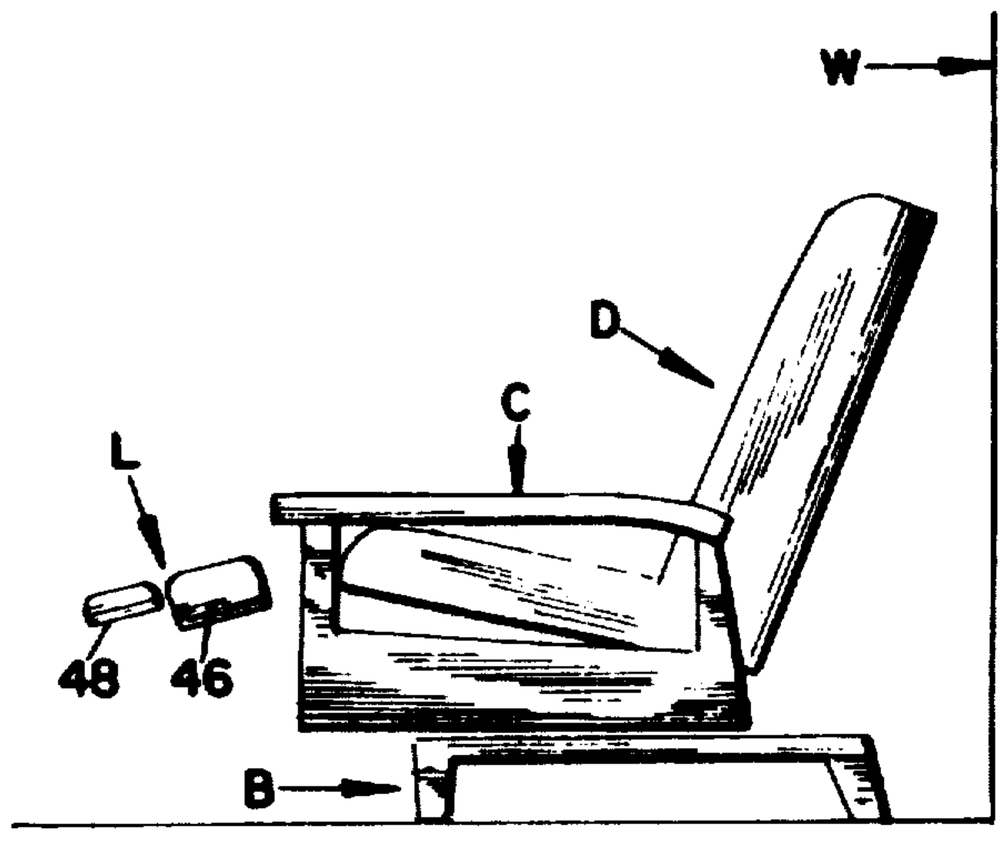
Primary Examiner—James T. McCall
Attorney, Agent, or Firm—Ross, Ross & Flavin

[57] **ABSTRACT**

A reclining chair adapted to be positioned in close adjacency to a room wall when in the upright sitting position and yet so structured as to allow ready assumption of any of a variety of reclined positions of occupancy without physical contact of any element thereof with the same room wall, the chair concept envisioning a fixed platform, a chassis slideable rectilinearly relative to the platform, and a body-supporting unit movable between the sitting and reclining positions relative to the chassis with a concomitant movement of a leg supporting unit between the retracted and extended positions respectively, a propeller link or other means connecting between the body-supporting unit and platform for propelling the body-supporting unit relative to the platform, with the chassis moving forwardly and progressively away from the wall as transition is made from upright sitting position to progressive positions of reclination, wherefore the body supporting unit is concomitantly moved forwardly away from the room wall, and with the chassis moving rearwardly and progressively toward the wall as transition is made from positions of reclination to upright sitting position, wherefore the body-supporting unit is concomitantly moved rearwardly and toward the room wall.

5 Claims, 19 Drawing Figures



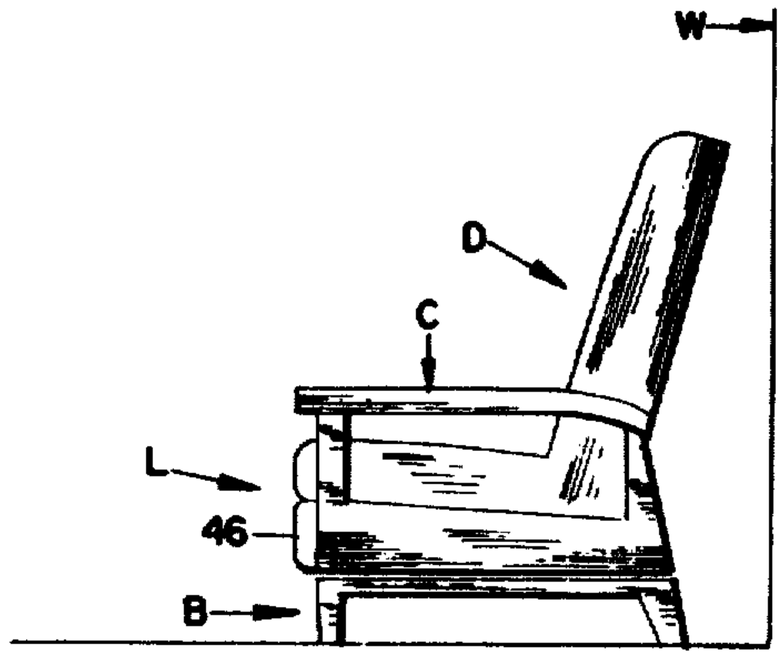


FIG. 1.

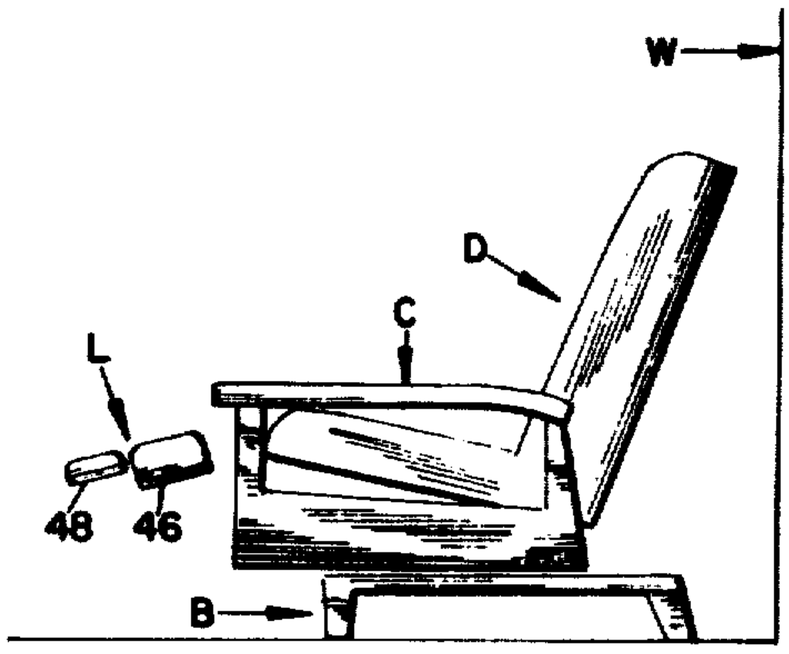


FIG. 2.

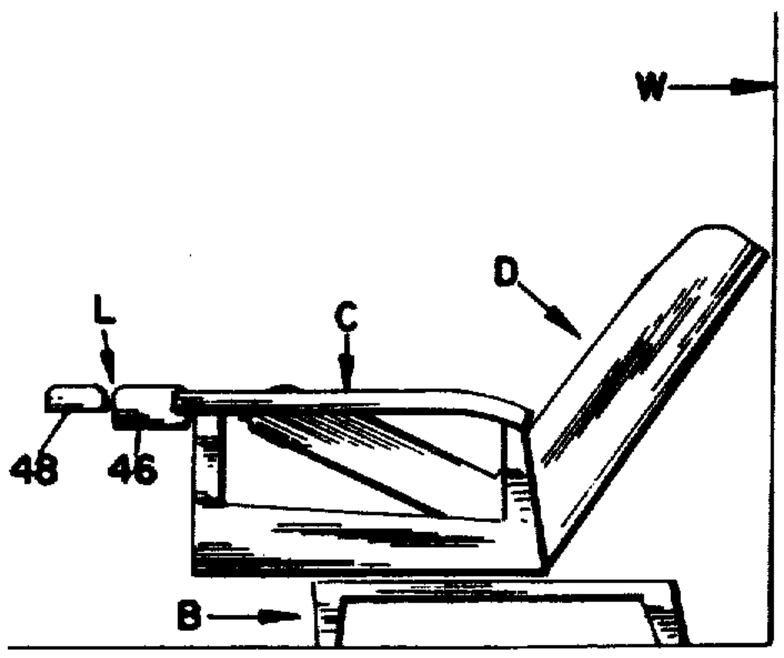


FIG. 3.

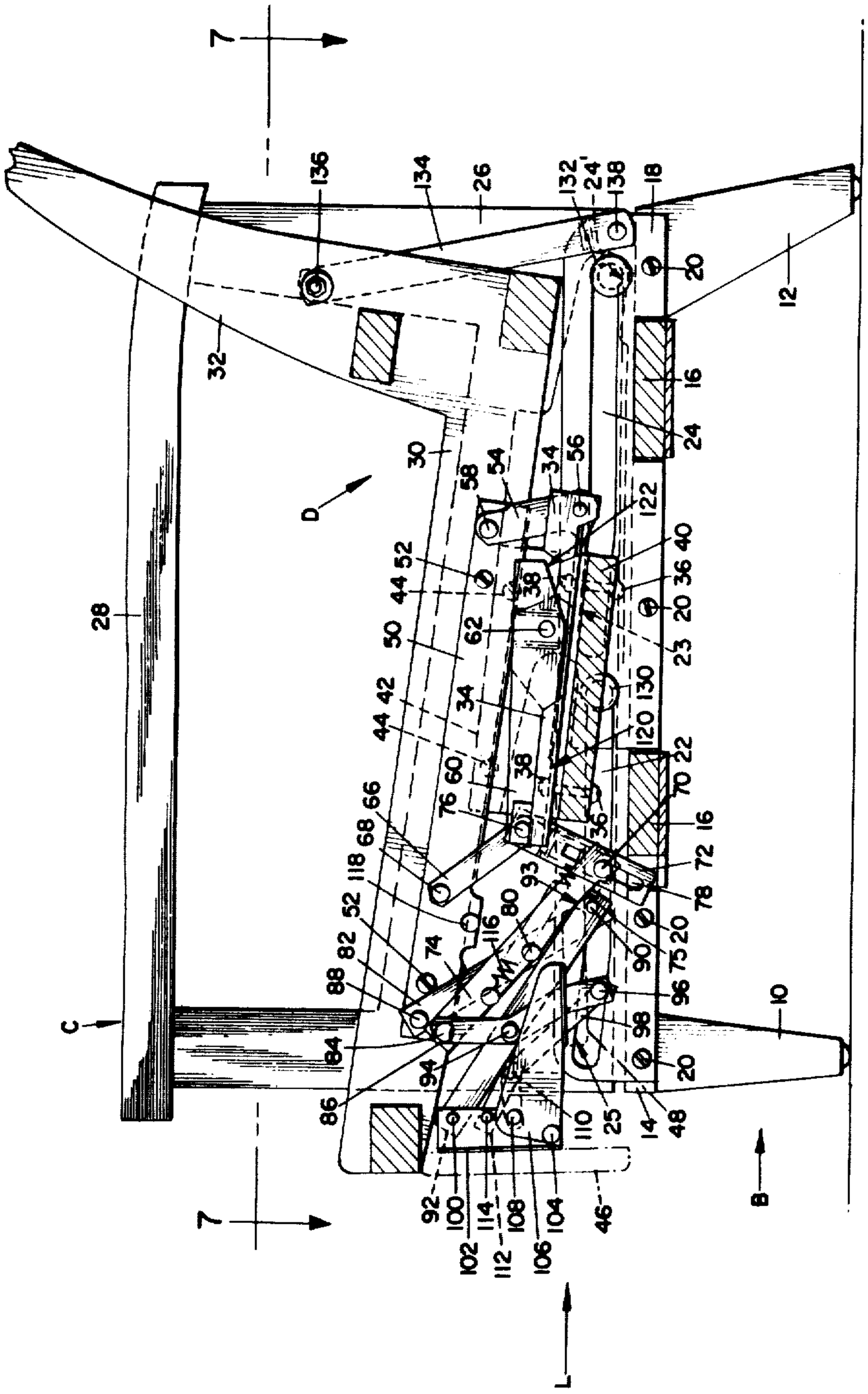

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FIG. 4.

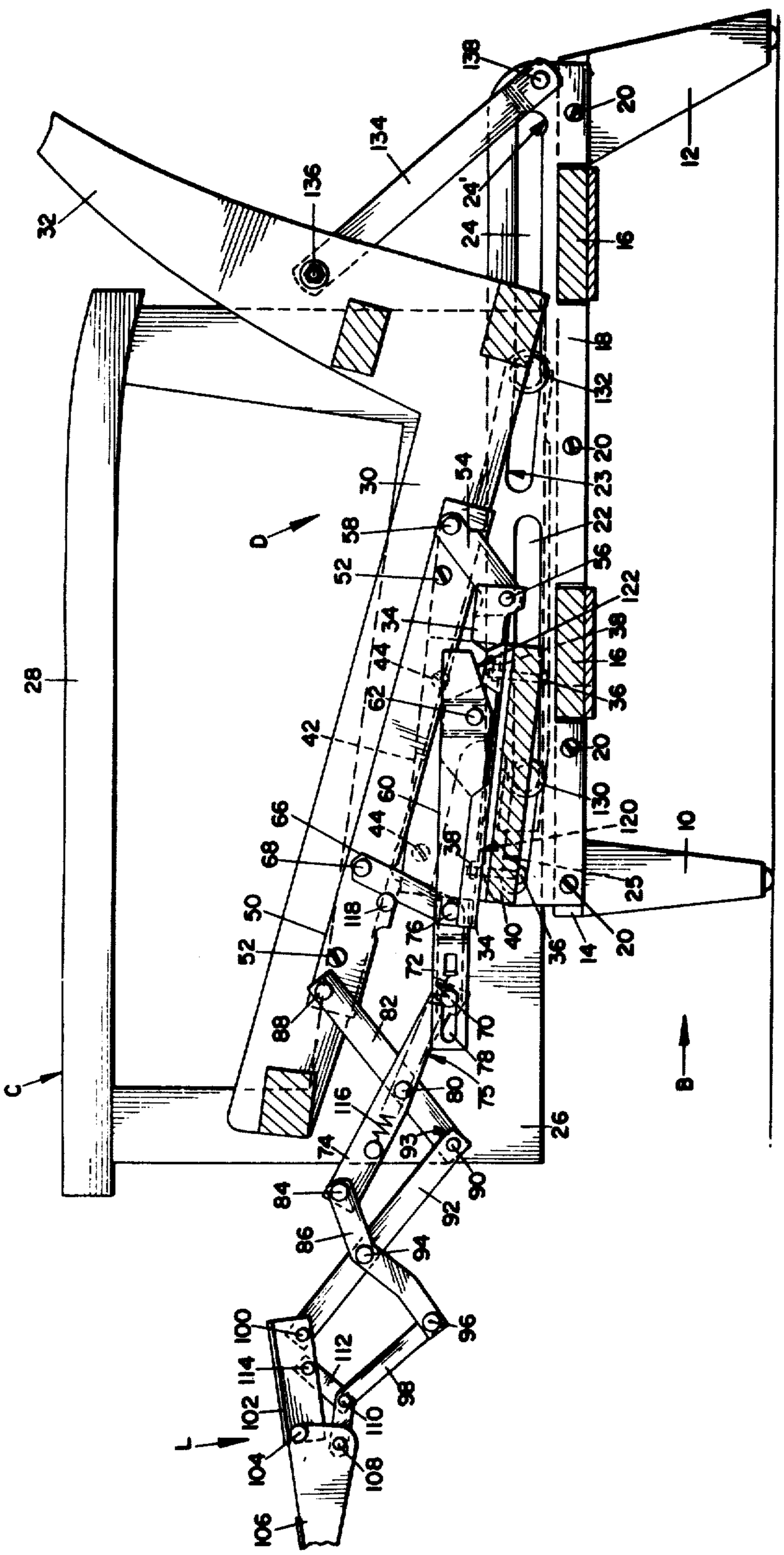
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FIG. 5.

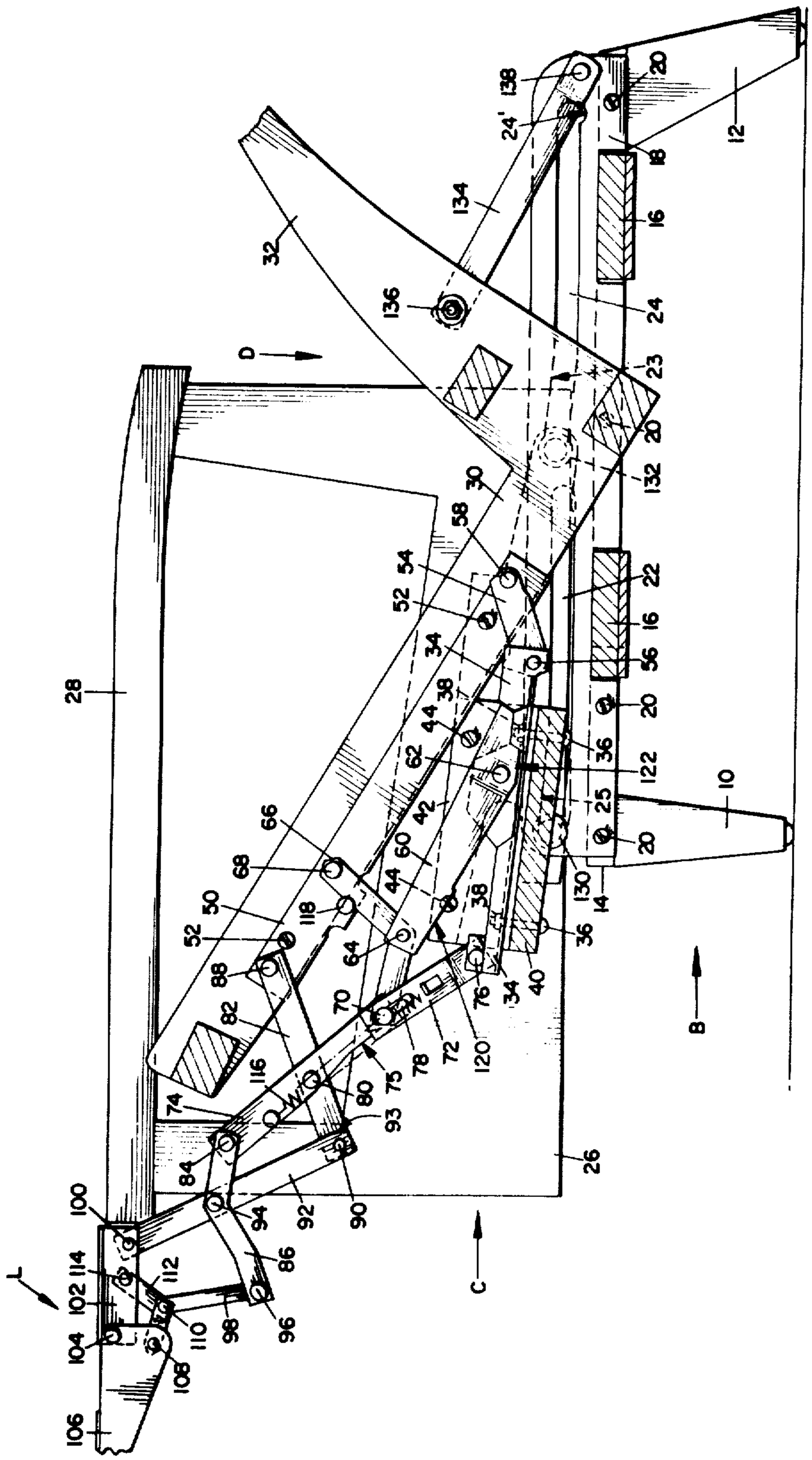
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FIG. 6.

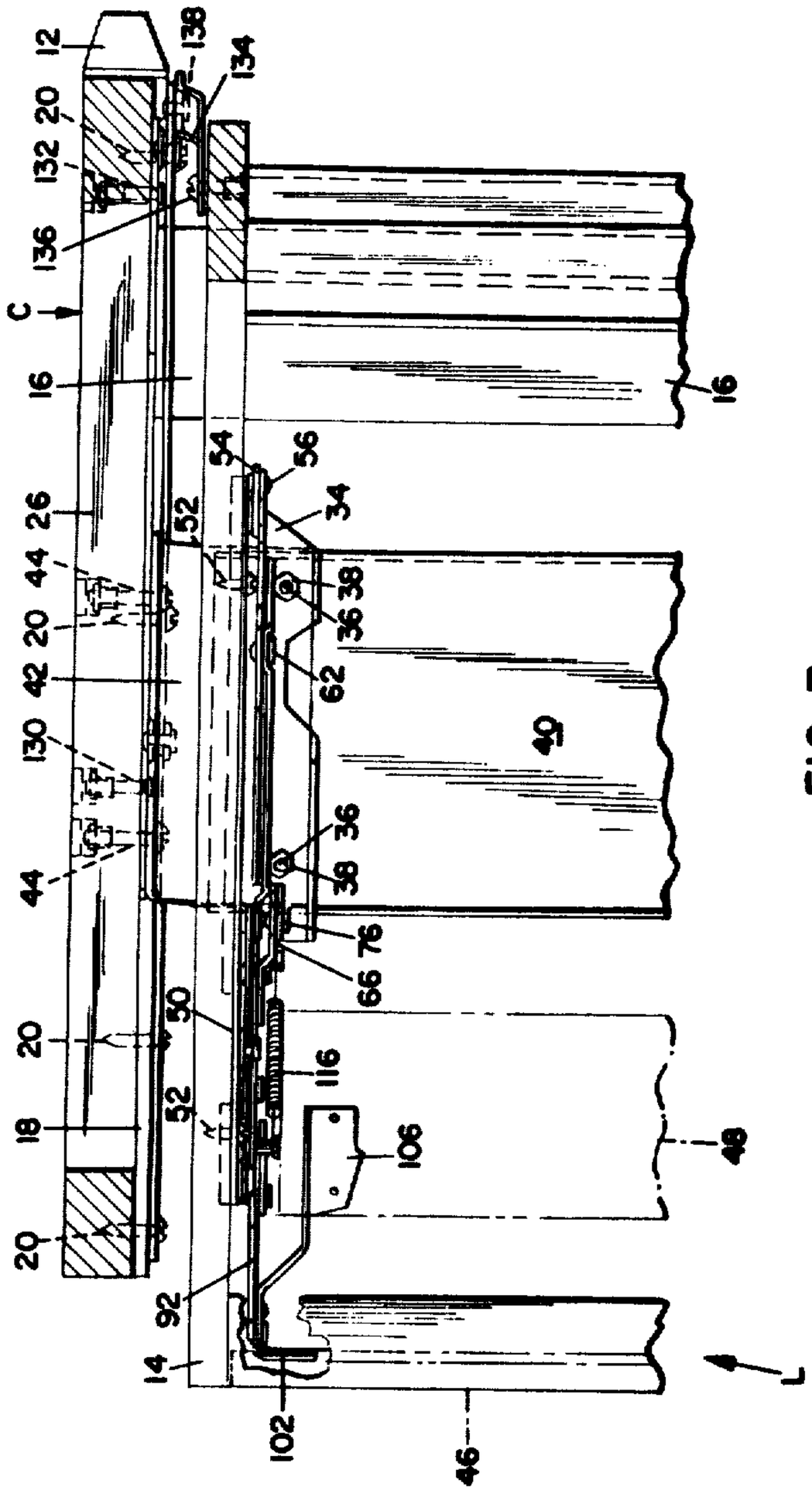
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FIG. 7.

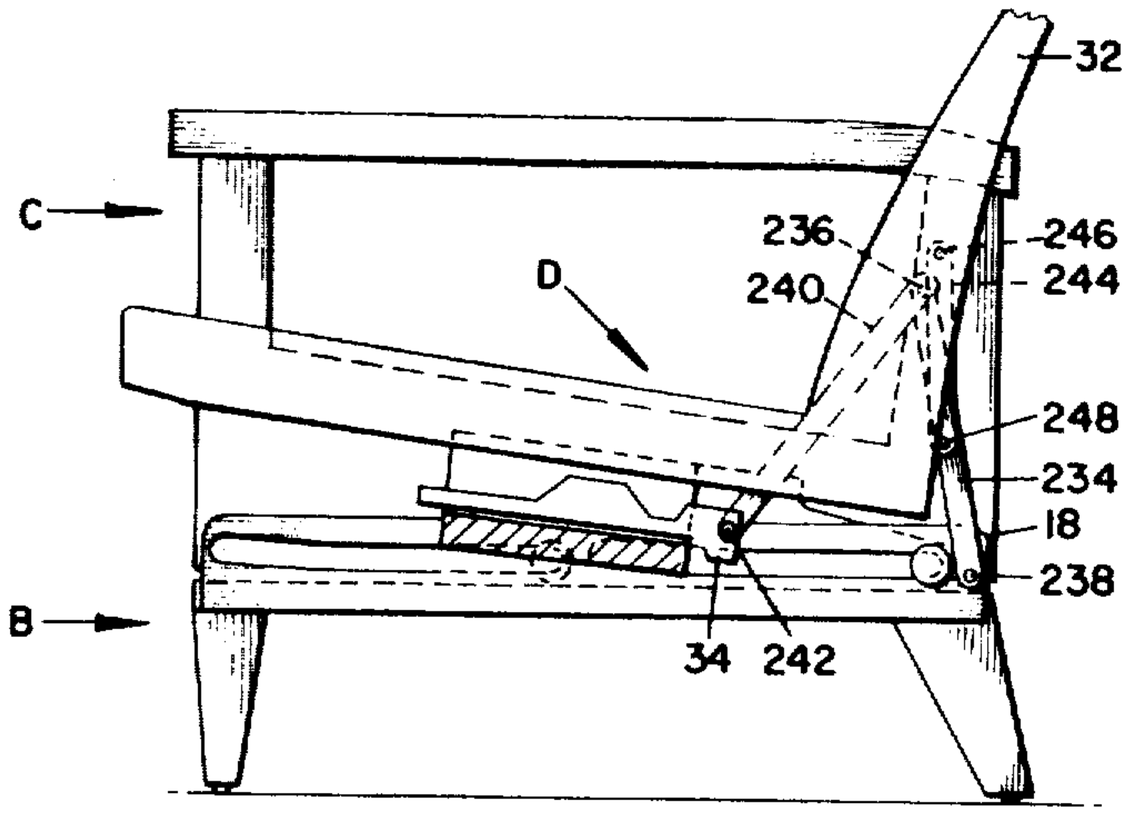

FIG. 8.

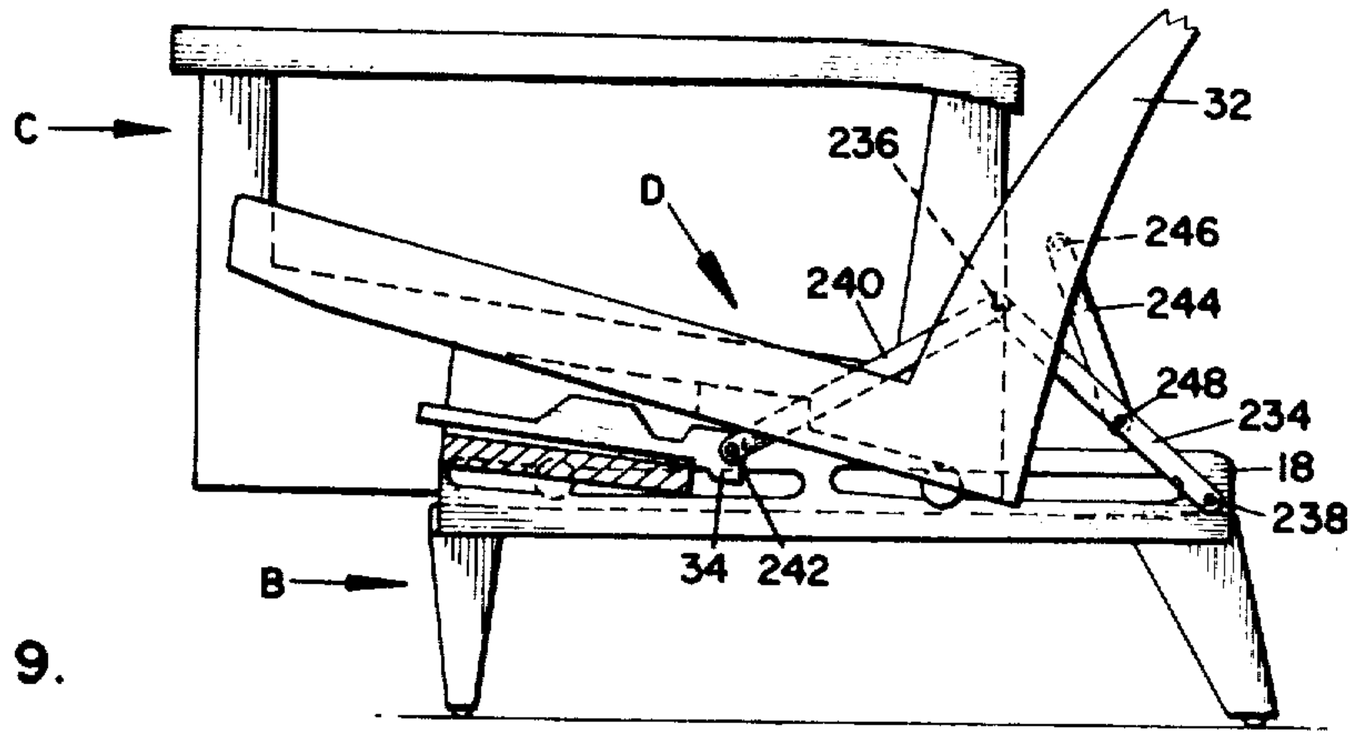

FIG. 9.

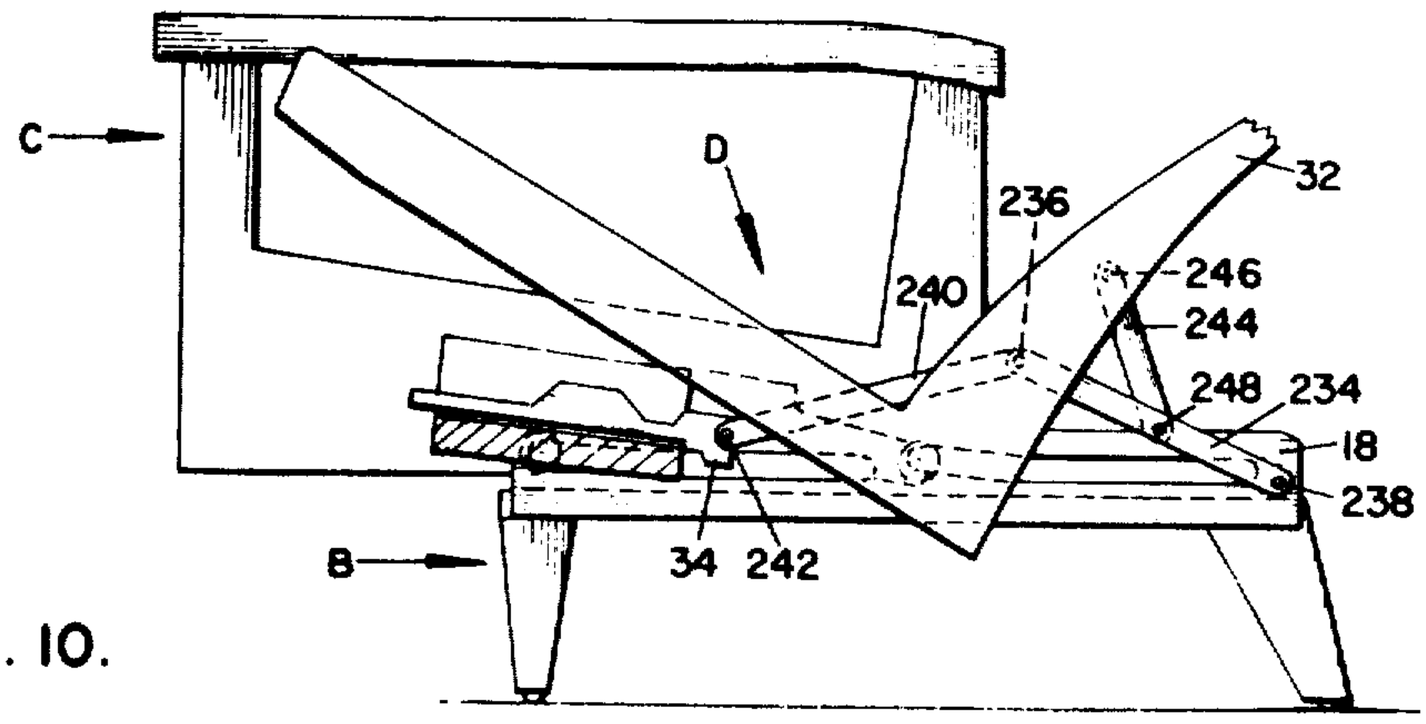

FIG. 10.

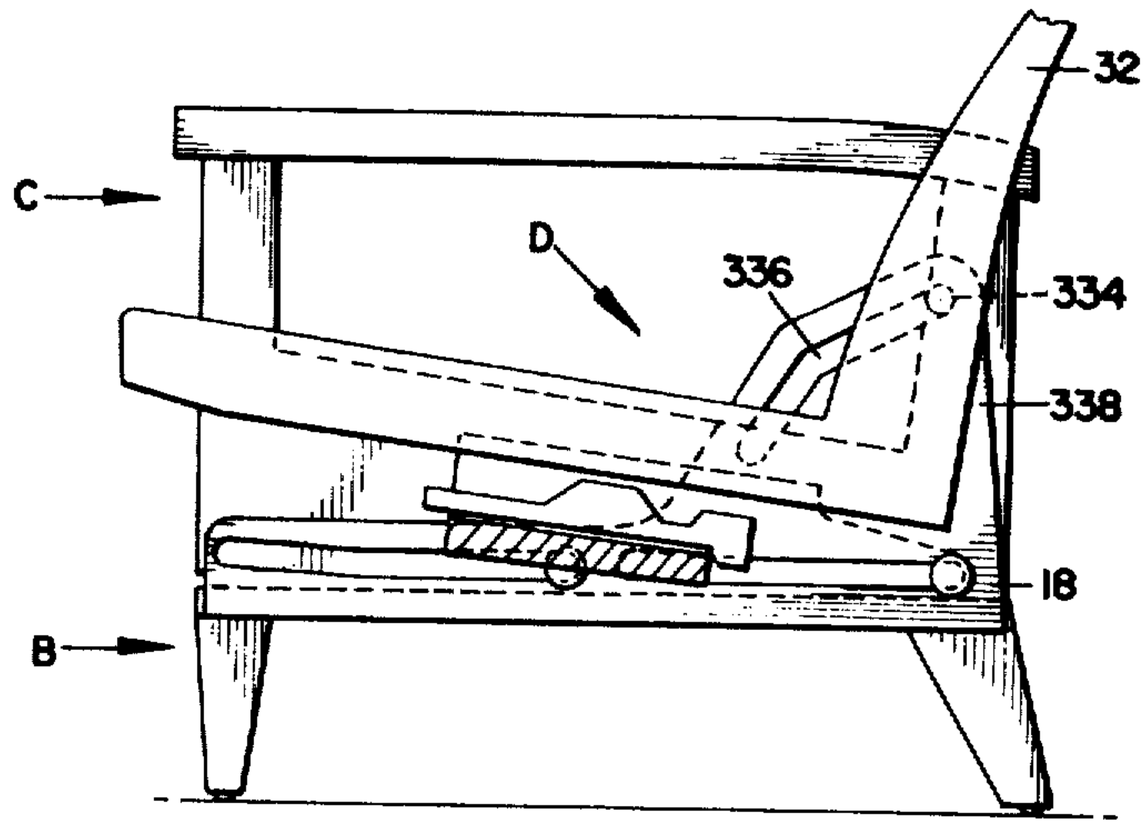

FIG. 11.

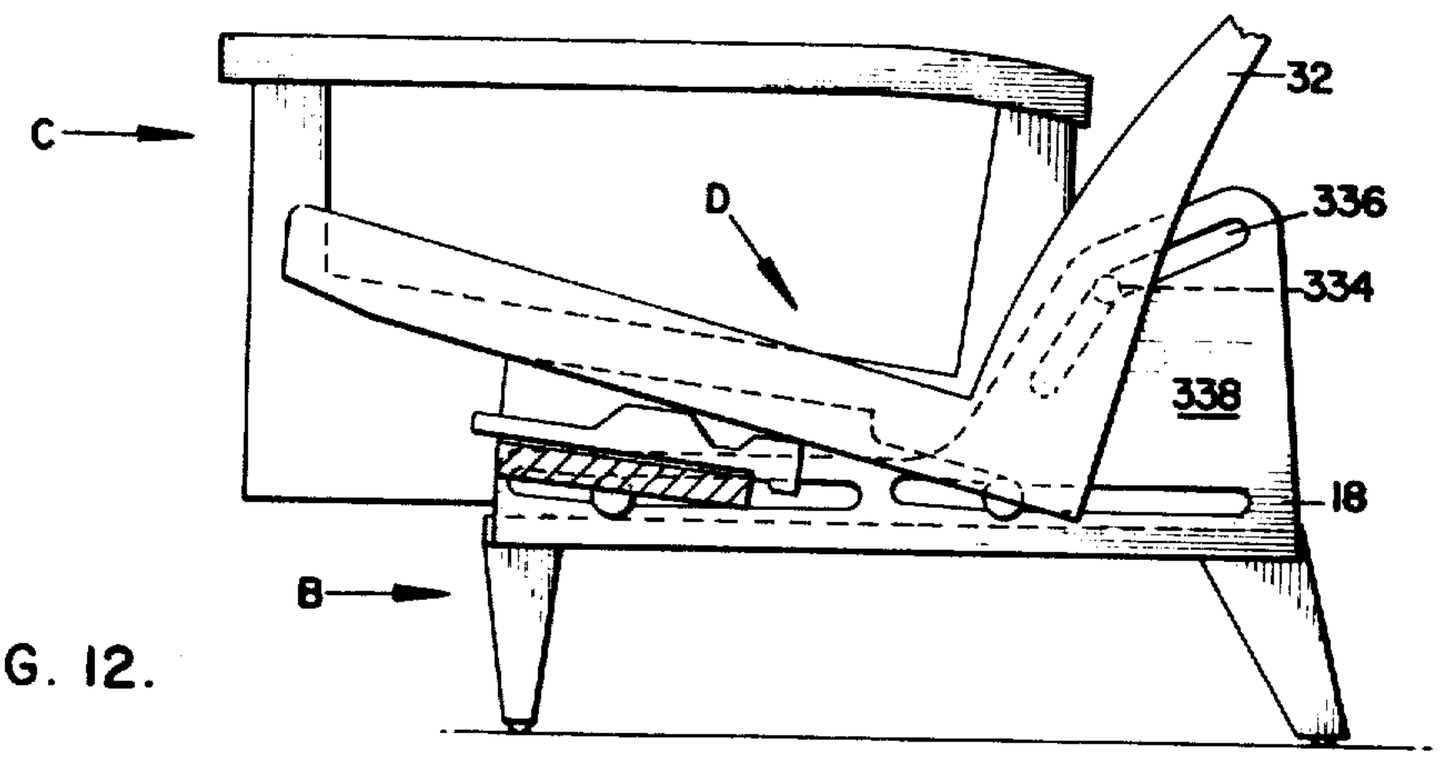

FIG. 12.

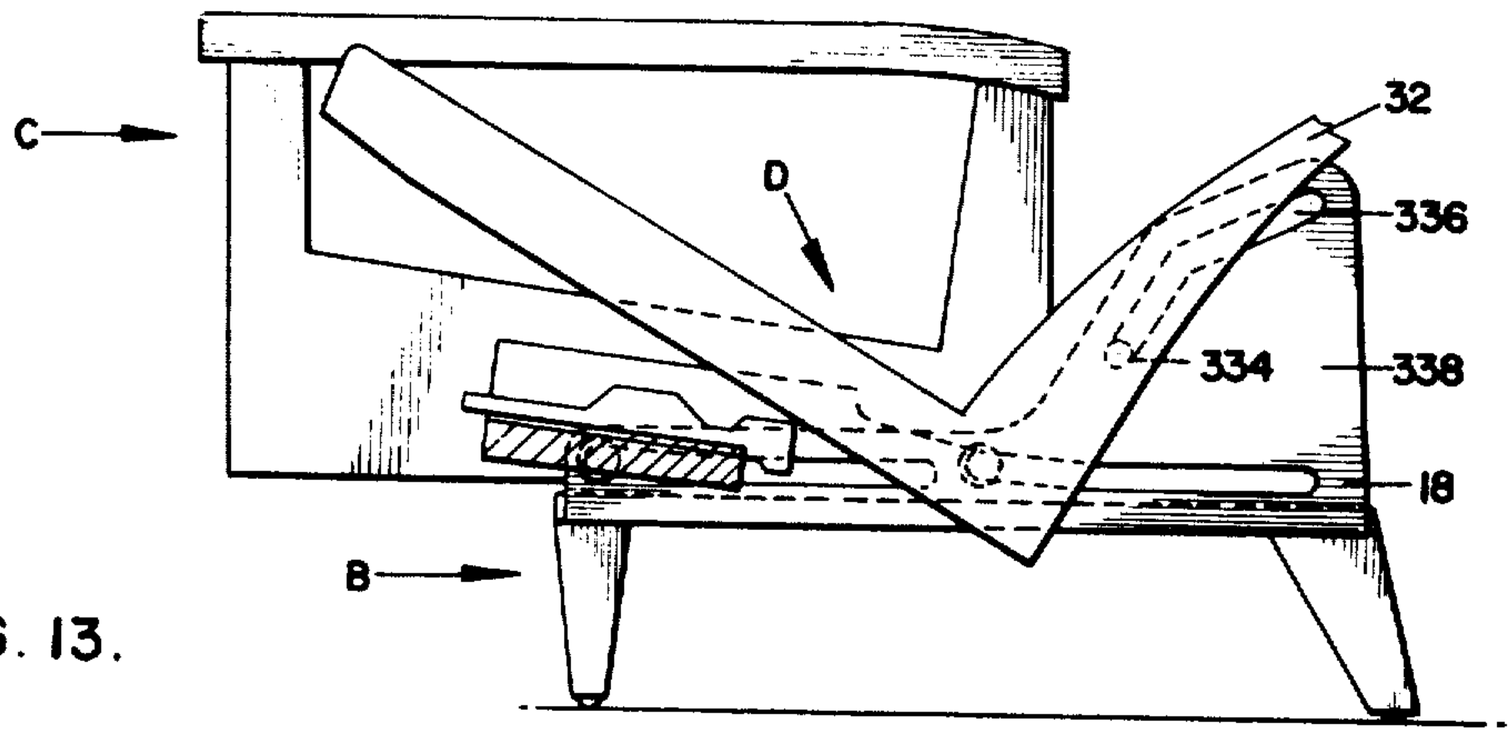

FIG. 13.

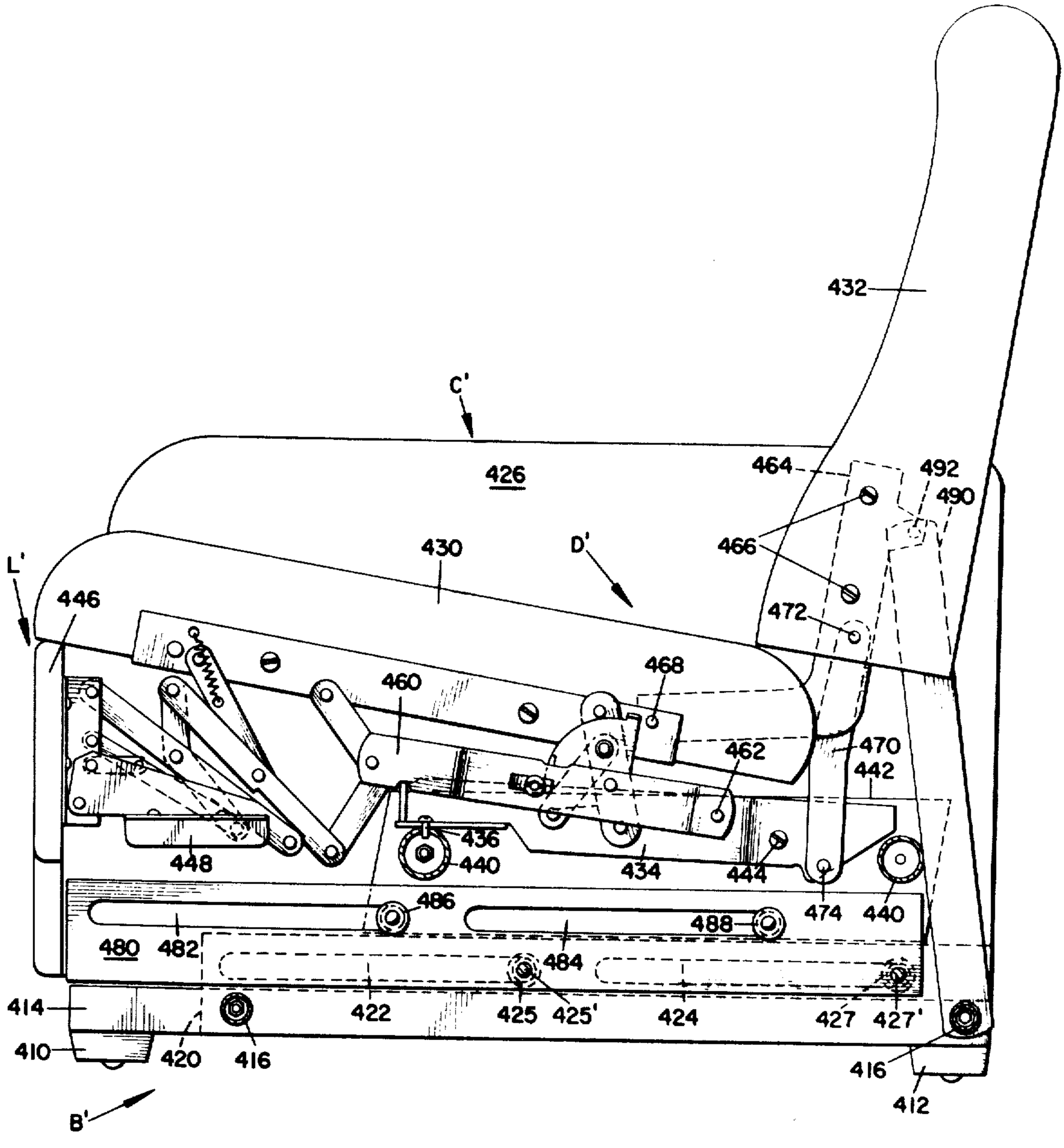
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FIG. 14.

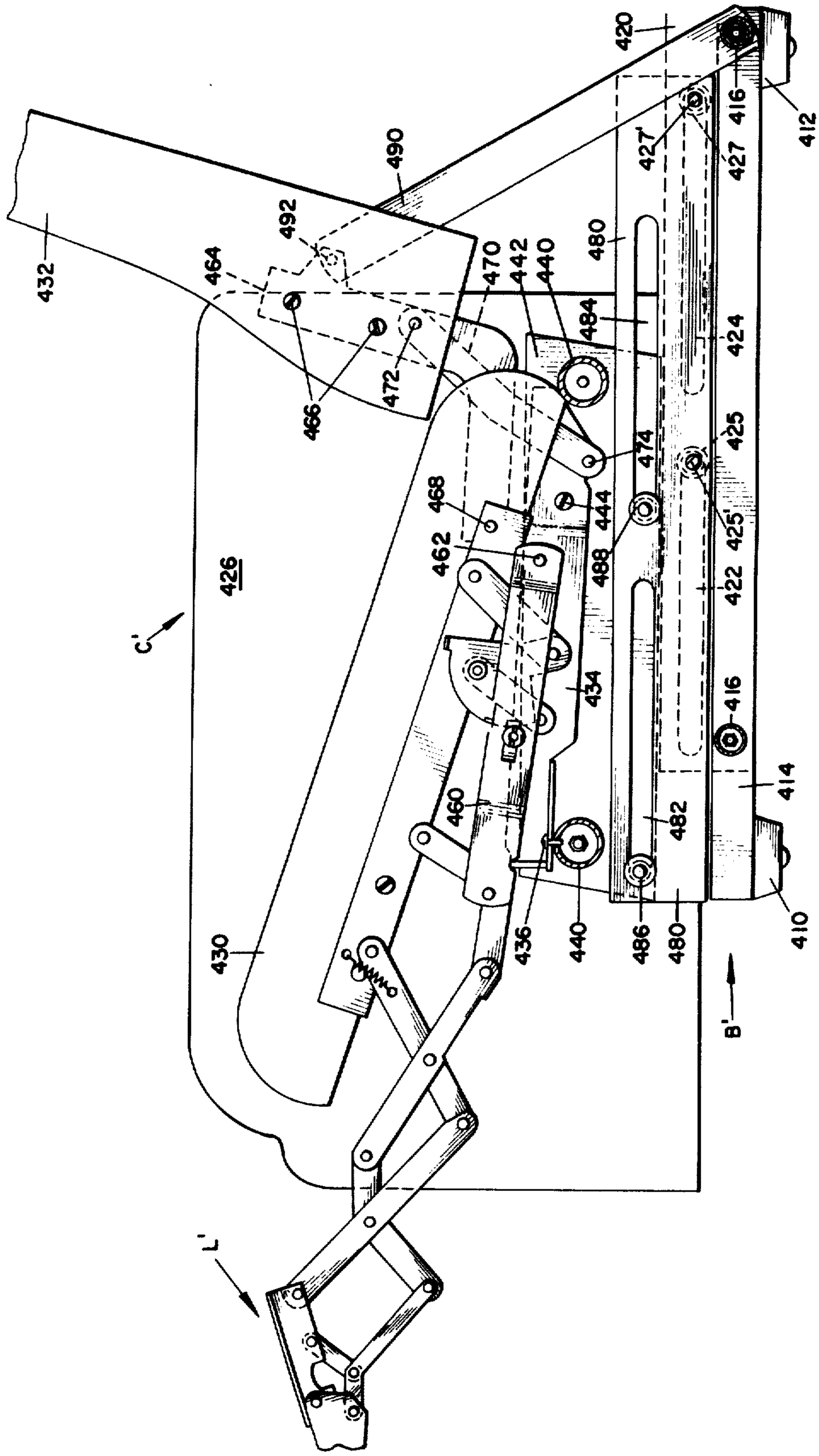
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FIG. 15.

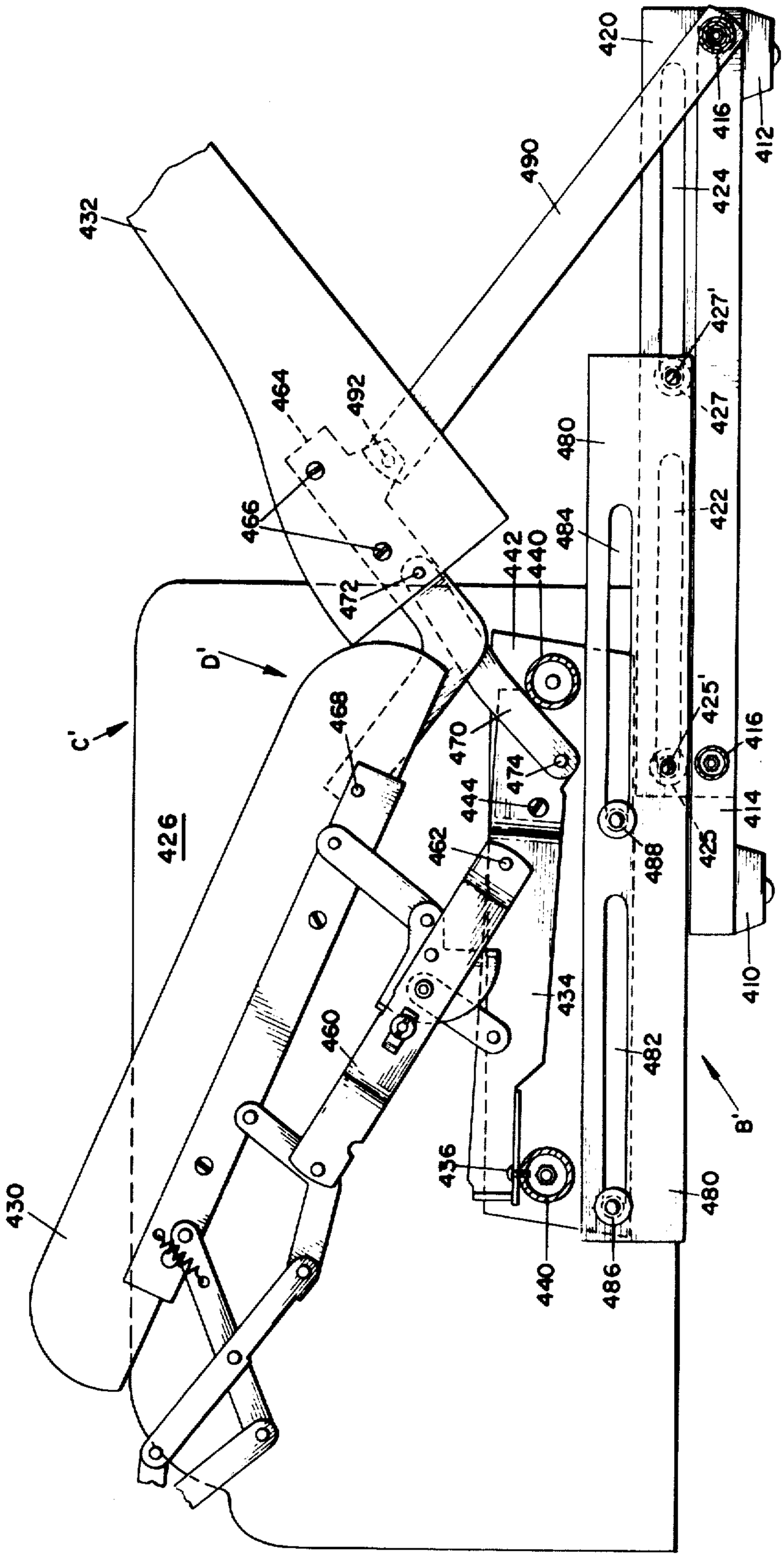
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FIG. 16.

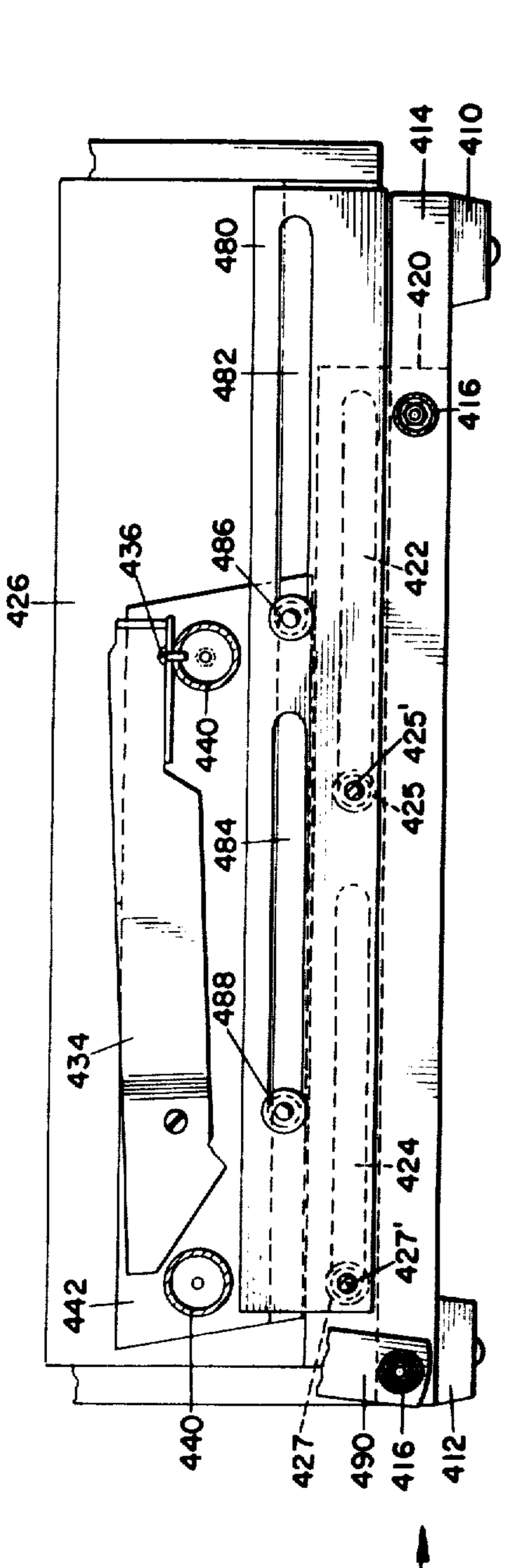

FIG. 17.

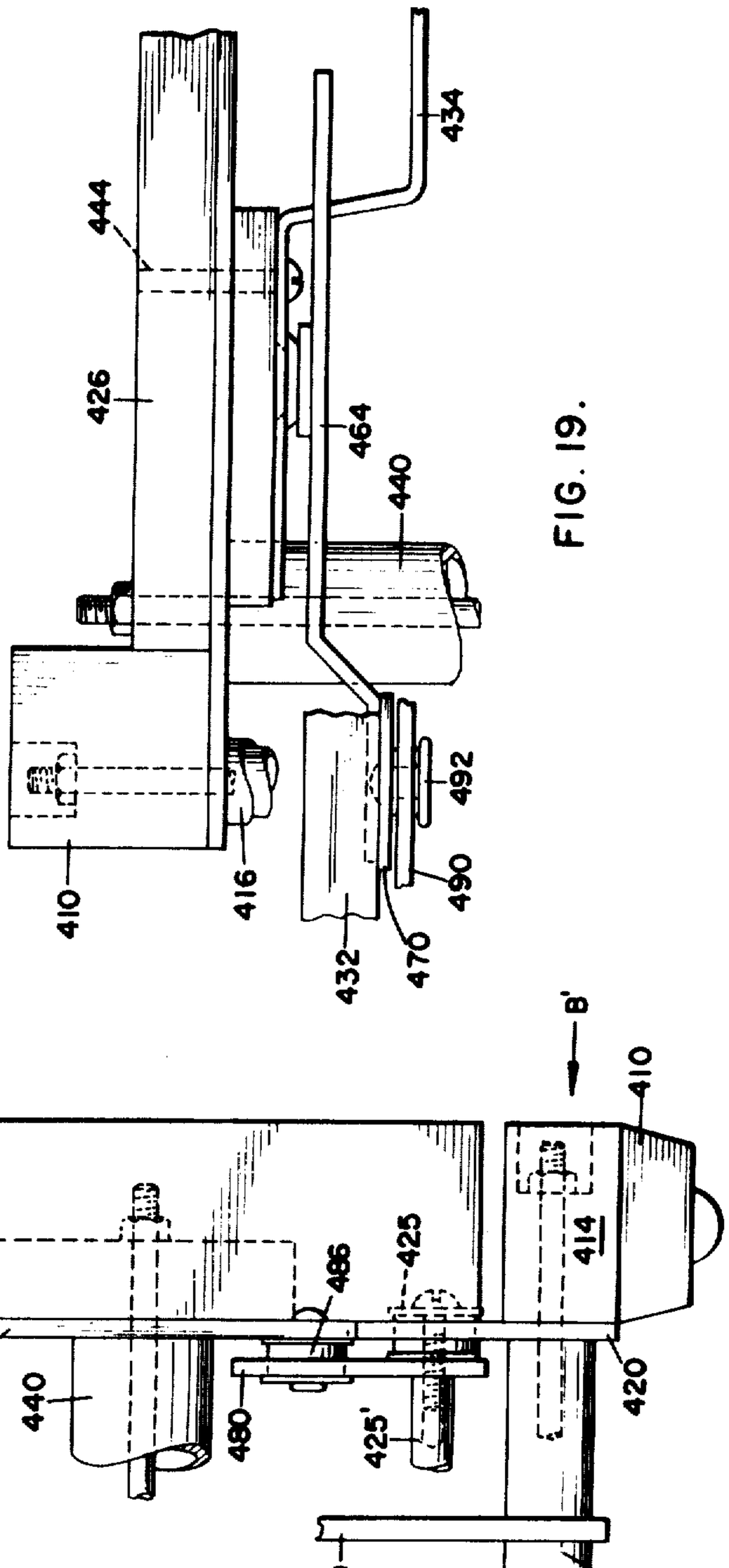

FIG. 18.

FIG. 19.

RECLINING CHAIR

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

[This is a division, of appplication Ser. No. 222,563, filed Feb. 1, 1972, now U.S. Pat. No. 3,758,151.] *This reissue of U.S. Pat. 3,874,724, was originally filed as application Ser. No. 307,176, on Nov. 16, 1972. The latter application was a division of application Ser. No. 222,563, filed Feb. 1, 1972, and issued as U.S. Pat. No. 3,758,151, which was subsequently reissued on application Ser. No. 435,461, filed Jan. 22, 1974, now U.S. Pat. No. Re 28,210.*

The invention provides a reclining chair which can be positioned in close proximity to a wall or lamp or other article of furniture.

It has long been a problem in the reclining chair art that the chair of necessity had to be placed a sufficient distance away from the wall or article of furniture as to allow movement of part of the body-supporting unit in the area rearwardly of the vertical plane of the rear legs of the chair, the unit, and more particularly the back thereof, moving rearwardly in the course of any shifting between upright and any reclined positions.

The problem is here solved by the provision of means for moving the body-supporting unit forwardly relative to the platform and away from the wall as reclination ensues wherefore the chair can be positioned in close proximity to a wall.

In the drawings:

FIGS. **1–3** are schematic representations of a chair embodying one form of the invention showing the positions of the several chair components relative to a wall as the chair is moved from an upright sitting position first to a partially-reclined position and then to a fully-reclined position;

FIG. **4** is a fragmentary view, in longitudinal section, of the chair of FIGS. **1–3** in upright, sitting position;

FIG. **5** is a view, similar to FIG. **4**, showing the chair in intermediate reclined or TV position;

FIG. **6** is a view, similar to FIG. **4**, showing the chair in fully-reclined position;

FIG. **7** is a fragmentary view in cross-section on line 7–7 of FIG. **4**;

FIGS. **8–10** are fragmentary views, in longitudinal section, of a chair embodying a first modified form of the invention, with the leg rest and reclining mechanism omitted for simplicity, the chair being shown in upright, intermediate reclined, and fully-reclined positions respectively;

FIGS. **11–13** are fragmentary views, similar to FIGS. **8–10**, of a chair embodying a second modified form of the invention;

FIG. **14** is a fragmentary view, in longitudinal section, of a chair embodying a third modified form of the invention, the chair being shown in upright, sitting position;

FIG. **15** is a view, similar to FIG. **14**, showing the chair in intermediate reclined or TV position;

FIG. **16** is a view, similar to FIG. **14**, showing the chair in fully-reclined position;

FIG. **17** is a fragmentary view, in longitudinal section, of a portion of the chair of FIG. **14**, with parts omitted for simplicity;

FIG. **18** is an enlarged, fragmentary view, in end elevation, of the portion of the chair of FIG. **17**; and

FIG. **19** is an enlarged, fragmentary view, in top plan, of the portion of the chair of FIG. **17**.

Referring first to FIGS. **1–3**, chairs of the type envisioned having a platform B and a chassis C mounting a body-supporting unit D (i.e., seat and back which may be unitary as to each other or shiftable with respect to each other) and a leg supporting unit L, are shiftable between an upright sitting position where little, if any, of the body supporting unit is disposed in an area rearwardly of the vertical plane of the rearwardly disposed legs or of the rearwardmost portion of the platform, and various positions of reclination where some portion of the body supporting unit is disposed in that area. This being so, chairs heretofore known have had to be positioned distantly of a room wall W if reclination was to be accomplished successfully and without physical contact being had between chair and wall.

If positioning close to a wall was desired, the chair would have to be withdrawn away therefrom in order to allow successful reclination.

With the chair hereof, as body-supporting unit D is reclined, chassis C move linearly relative to platform B away from wall W to provide the necessary clearance for the body-supporting unit as the chair elements move between the upright position of FIG. **1** and the partially reclined position of FIG. **2** and/or the fully-reclined position of FIG. **3**.

In the form of the invention seen in FIGS. **4–7**, platform B comprises pairs of front and rear legs **10** and **12** respectively disposed at each side of the chair and interconnected by side rails **14** extending in a front-to-rear chair direction and by transversely-extending cross-rails **16** interconnecting the side rails in known manner.

A vertically oriented slotted plate **18** is fixed to each side rail **14** as by screws or bolts **20**, extends upwardly therefrom, and is provided with a pair of spaced, generally horizontally extending, aligned, front and rear slots **22** and **24** respectively. The forwardly facing extremity of each slot serves as a small rise, indicated by **23** and **25** respectively, for purposes to appear.

Chassis C includes a pair of spaced, upright side walls **26** of any conventional configuration and disposed at each side of the chair, each side wall carrying a chair arm **28**.

Body-supporting unit D includes a seat **30** and a back **32**, which may be unitary, as shown in FIGS. **1–7**, or which may be separable, as will be described with reference to FIGS. **14–19**.

The means interconnecting platform B, chassis C, body-supporting unit D and leg-supporting unit L includes a pair of linkage mechanisms, there being one at each side of the body-supporting unit inwardly of the respective adjacent side wall of the chassis so as to be concealed from view. Only one such linkage mechanism is herein defined, they being identical for all practical purposes, one being a right hand and one being a left hand mechanism. Such mechanism could be of the types as disclosed in U.S. Pat. No. 3,044,827 of July 17, 1962, No. 3,058,774 of Oct. 16, 1962, or No. 3,166,352 of Jan. 19, 1965, to name but a few, or their kinematic equivalents, for purposes of exemplification.

A generally horizontally disposed base plate **34**, extending along the front-to-rear chair axis, is stationarily

fixed as by bolts **36** and nuts **38** to a cross rail or stretcher **40** extending transversely relative to and between chassis side walls **26**, and is fixed at its opposite ends to a plate **42** mounted on each side wall as by screws or bolts **44**.

Leg supporting unit L may be of the one-part type or of the two-part type, as shown herein. The two-part type is constituted by a large foot stool **46** and a small foot stool **48** pivotally interconnected. The leg supporting unit, whichever is type, is mounted, by means of said linkage mechanisms, relative to the forward area of seat **30**, for constrained movements between a fully retracted position, as viewed in FIGS. **1**, **4** and **7**, and a fully extended position, as viewed in FIGS. **3**, and **6**.

With the chair in fully upright position, the leg supporting unit is in fully retracted position with large footstool **46** positioned substantially flush with or in the vertical plane of the forward end of seat **30** and with the cooperant pivotally connected small footstool **48** extending rearwardly from adjacent the lower extremity of the large footstool so as to be concealed from view below the seat and rearwardly of the large footstool. When large footstool **46** is elevated and advanced to an extended position, cooperant small footstool **48** is moved therewith accordingly and is in an axially aligned position forwardly thereof.

The body-supporting unit and the leg supporting unit are operatively connected to base plate **34** and to each other.

A seat plate **50** extends along the front-to-rear chair axis and is stationarily secured to the adjacent side rail of seat **30** as by screws or bolts **52**.

A pivot link **54** is pivoted at **56** at its lower end to the rearward end of base plate **34** and at its upper end at **58** to seat plate **50** adjacent the rearward end of the latter.

A rise bar **60** is pivoted adjacent its rearward end at **62** to the approximate midsection of base plate **34**, and is pivoted adjacent its forward end at **64**, (see FIG. **6**), to an L-link **66**.

L-link **66** is pivoted at **68** at its upper end to seat plate **50** and is pivoted at its lower end at **70** at one end of a slotted link **72** and to the rearward end of a first long link **74**.

Slotted link **72** is pivoted at **76** at its opposite end to the forward end of base plate **34** and has a slot **78** therein adjacent its forward end in which pivot **70** is slidable.

First long link **74** is pivoted at its approximate midsection at **80** to the approximate midsection of a first elevator link **82** and is provided at its forward end at **84** to the rearward end of a second elevator link **86**.

First elevator link **82** is pivoted at its upper end at **88** to seat plate **50** adjacent the forward end thereof and is pivoted at its lower end at **90** to the lower rearward end of a second long link **92**.

Second elevator link **86** is pivoted at its approximate midsection at **94** to the approximate midsection of second long link **92** and is pivoted at its lower end at **96** to the lower rearward end of a small foot stool link **98**.

Second long link **92** is pivoted at its forward end at **100** to one end of a large foot stool support plate **102** to which large foot stool **46** is fixed; large footstool support plate **102** is pivoted at its opposite end at **104** to a small footstool support plate **106** to which small footstool **48** is fixed.

Small footstool link **98** is pivoted at its forward end at **108** to small footstool support plate **106** and is pivoted at **110** rearwardly of its forward end to the lower end of a

connecting link **112** which is pivoted at its opposite end at **114** to large footstool support plate **102**.

A buffer-retainer tension spring **116** is mounted at one end on slotted link **72** and is mounted at its opposite end on first long link **74**, the spring acting much in the manner of a buffing device to buffer chair tilting as it approaches fully reclined position and additionally to insure that the leg-supporting unit remains retracted when the chair is in upright position.

The functions of slotted link **72** are three-fold: (1) it serves as a carrier for the buffer-retainer spring **116**; (2) it precludes reclining of the chair without a concomitant extension of the leg-supporting unit; and (3) it precludes retraction of the leg-supporting unit while the chair is in fully reclined position.

A stop pin **118** on seat plate **50**, when contacted by a leasing edge of L-link **66**, limits the range of outward movement of the leg-supporting unit.

A first stop surface **120** of rise bar **60**, when it contacts base plate **34**, limits the range of downward movement of the body-supporting unit.

In the chair upright position, second long link **92** abuts first long link **74** to limit the range of rearward movement of the leg-supporting unit, with a flat **93** on the rearwardly facing face of link **92** being receivable in a notch **75** on the forwardly facing face of link **74**.

In use, when the chair is moved from upright position to an intermediate reclining position, rise bar **60** remains in a generally horizontal position, with first stop surface **120** thereof in contact with base plate **34**, and with the large and small foot stools extended, the ease of such extension being controlled by spring **116**, while L-link **66** contacts stop pin **118** to preclude further leg-supporting unit extension.

When the chair is moved from intermediate reclined position, to a fully reclined position, rise bar **60** pivots at **62** relatively to base plate **34**, pivot pin **70** moves forwardly in slot **78** of slotted link **72** to preclude closing of the leg-supporting unit while in the fully reclined position, and a second stop surface **122** of rise bar **60** contacts base plate **34** to limit the range of reclining movement of the body-supporting unit.

Chassis C is slidably related to base B by means of front and rear rollers **130** and **132** respectively which extend outwardly from plate **42** at each side wall **26** of the chassis, front roller **130** being rideable in front slot **22** of plate **18** and rear roller **132** being rideable in rear slot **24** therein.

The [rides] *rises* **23** and **25**, together with spring **116** control or lessen any falling sensation as reclining takes place, it being understood that the greater the upward slope of each rise, the more difficult forward movement of the chassis becomes.

In the chair upright position of FIG. **4**, the rollers are disposed at the rear ends of their respective slots **22** and **24**.

As the body-supporting unit is moved to the intermediate reclining position of FIG. **5**, the rollers slide along the slots to a position wherein they are disposed somewhat forwardly of the approximate midsections of the slots.

Movement of the body-supporting unit to fully reclined position moves the rollers to the forward extremities of the slots as shown in FIG. **6**, with the rises **23** and **25** and spring **116** controlling such movement as aforesaid.

A propeller link **134**, pivoted at its upper end at **136** to backrest **32** and at its lower end at **138** to plate **18**, pro-

pels and controls the range of movement of the body-supporting unit relative to the platform.

The key to the invention is to propeller link **134** for it propels the body-supporting unit and chassis forwardly as reclination occurs, as well as rearwardly on assuming the upright position, with the rollers **130** and **132** riding in the slots **22** and **24** respectively.

In the chair upright position roller **132** rests in a slight recess or groove **24'** provided adjacent the rearward end of slot **24**, the groove serving as an impediment to unwanted sudden sliding movement of the roller relative to the slot.

In effect, in movement from upright to intermediate position, the rear roller must be lifted out of groove **24'** with the chassis rotating about front roller **130** as reclination occurs.

The single propeller link **134** of FIGS. **1–7** is replaced in the modified form of FIGS. **8–10** by a trio of links.

The leg-supporting unit and reclining linkage have been omitted in FIGS. **8–10** for purposes of simplicity.

Herein, a primary propeller link **234** is provided at its upper end at **236** to one end of a secondary propeller link **240** and at its lower end at **238** to plate **18**, with secondary propeller link **240** being pivoted at its opposite end at **242** to the rearward end of base plate **34**.

A control link **244** is pivoted at one end at **246** to backrest **32** and at its opposite end at **248** to the approximate midsection of primary propeller link **234**.

The trio of links operates directly on the chassis through the connection **242** with base plate **34**, while operating on the body-supporting unit through control link **244**, wherefore rectilinear movements of the chassis and body-supporting units relative to the platform are effected.

In the embodiment of FIGS. **11–13**, the leg-supporting unit and reclining linkage have once again been omitted for simplicity.

In this form of the invention, the propelling means comprises a roller **334** fixed to backrest **32** and rideable in a cam slot **336** provided in an extension **338** of plate **18**.

As reclination occurs, the captured roller drives the chassis and body-supporting unit forwardly. On assuming the upright position the chassis and body-supporting unit is driven rearwardly.

The somewhat dog-leg shape of slot **336** provides a dwell for the intermediate reclining or TV position as shown in FIG. **12**.

The embodiment of FIGS. **14–19** has been modified for use with a chair of the type having a separable seat and back.

In this instance a double-track system is employed, such a system being necessary since, with chairs of this type, the components travel farther away from the wall. Thus, a double track was designed so that all of the sliding means would be under cover of the chair.

Basically, however, the sliding and motivating means are the same as those shown for use with the unitary seat and back chair of FIGS. **1–13**.

Herein, a platform B' supports a chassis C' mounting a body-supporting unit D' and a leg-supporting unit L'.

The means interconnecting platform B', chassis C', body-supporting unit D' and leg-supporting unit L' includes a pair of linkage mechanisms, there being one at each side of the body-supporting unit inwardly of the respective adjacent side wall of the chassis so as to be concealed from view. Only one such linkage mechanism is herein defined, they being identical for all practical purposes, one being a right hand and one being a left hand mechanism.

The mechanism shown is identical to that shown and described in my U.S. Pat. No. 3,137,521 of June 16, 1964. However, it could be of any of the types as disclosed in U.S. Pat. No. 3,069,201 of Dec. 18, 1962, or No. 3,166,353 of Jan. 19, 1965 or No. 3,359,034 of Dec. 19, 1967, to name but a few, or their kinematic equivalents, for purposes of exemplification.

Since the mechanism is described in detail in the aforementioned U.S. Pat. No. 3,137,521, such detailed description will not be repeated here.

As body-supporting unit D' is reclined, chassis C' moves linearly relative to platform B' away from a wall, not shown, to provide the necessary clearance for the body-supporting unit relative to the wall as the chair elements move between the upright position of FIG. **14** and the partially reclined position of FIG. **15** and/or the fully reclined position of FIG. **16**.

In the form of the invention seen in FIGS. **14–19**, platform B' comprises pairs of front and rear legs **410** and **412** respectively disposed at each side of the chair and interconnected by side rails **414** extending in a front-to-rear chair direction and by transversely extending cross-bars **416** interconnecting the side rails in known manner.

Chassis C' includes a pair of spaced, upright side walls **426** of any conventional configuration and disposed at each side of the chair, each side wall additionally constituting a chair arm.

Body-supporting unit D' includes a seat **430** and a back **432**, which are separable, as shown.

As part of the reclining mechanism, a generally horizontally disposed base plate **434**, extending along the front-to-rear chair axis, is stationarily fixed as by a bolt **436** to one of a pair of cross bars **440** extending transversely relative to and between chassis side walls **426**, the cross bars being fixed at their opposite ends to a plate **442** mounted on each side wall. Screws or bolts **444** attach base plate **434** to plate **442**.

Leg supporting unit [L] *L'* may be of the one-part type or of the two-part type, as shown herein. The two-part type is constituted by a large foot stool **446** and a small foot stool **448** pivotally interconnected. The leg supporting unit, whichever its type, is mounted, by means of said linkage mechanisms, relative to the forward area of seat **430**, for constrained movements between a fully retracted position, as viewed in FIG. **14** and a fully extended position, as viewed in FIGS. **15** and **16**.

A rise bar **460** pivoted at **462** to base plate **434** serves as the primary means of interconnection between the leg-supporting unit, body-supporting unit and chassis.

A back-link **464** is fixed at one end as by screws **466** to back **432** and is pivoted at its opposite end at **468** to seat **430**, to interconnect the seat and back.

A pivot link **470** pivoted at one end at **472** to link **464** is pivoted at its lower end at **474** to base plate **434** to further interconnect the body-supporting unit and chassis.

A first vertically oriented slotted plate **420** is fixed to each side rail **414**, extends upwardly therefrom, and is provided with a pair of spaced, generally horizontally extending aligned front and rear slots **422** and **424** respectively.

A second vertically oriented slotted plate **480** is disposed inwardly of and in spaced parallelism to first slotted plate **420** and is provided with a pair of spaced,

generally horizontally extending, aligned front and rear slots **482** and **484** respectively, which slots are disposed above the plane of slots **422** and **424** of first plate **420**.

A first set of front and rear rollers **425** and **427** respectively is provided, with front roller **425** being rideable in front slot **422**, and with rear roller **427** being rideable in rear slot **424**.

The front rollers **425** at each side of the chair are interconnected by a cross rod **425'** and the rear rollers **427** are interconnected by a cross rod **427'**, the cross rods extending through the adjacent second slotted plates **480**.

A second set of front and rear rollers **486** and **488** respectively extends outwardly from plate **442** with front roller **486** being rideable in front slot **482**, and with rear roller **488** being rideable in rear slot **484**.

As the body-supporting unit is reclined, the chassis slides relative to the base in two stages: to the position shown in FIG. **15**, wherein the second set of rollers **486** and **488** slides to the forward ends of slots **482** and **484** of second plate **480**; and to the position shown in FIG. **16**, wherein the first set of rollers **425** and **427** slides to the forward ends of slots **422** and **424** of first plate **420**.

In the first stage of movement, from upright to intermediate position **[**the chassis and**]** both plates **420** and **480** remain stationary, with plate **442** moving to carry the body-supporting unit forwardly as the rollers **486** and **488** ride in their respective slots **482** and **484**.

In the second stage of movement from intermediate to fully reclined position, the chassis and plate **480** are moved forward relative to the stationary plate **420**, with the rollers **425** and **427** riding in their respective slots **422** and **424**.

Of course, these operations are reversed when the body-supporting unit is returned from fully-reclined position to upright position.

A propeller link **490**, pivoted at its upper end at **492** to link **464** and at its lower end at one of the cross bars **416** to the platform propels and controls the range of movement of the body-supporting unit relative to the platform.

The propeller link **490** propels the body-supporting unit and chassis forwardly as reclination occurs, as well as rearwardly on assuming the upright position, with the two sets of rollers riding in the two sets of slots.

Of course, the modified propeller means of FIGS. **8—13** could be employed in lieu of the single propeller link **490**.

Plate **[442]** *480* is unconstrained. Thus, it is possible that the chassis could move relative to slots **422** and **424** before plate **442** moves relative to slots **482** and **484**.

However, this contingency can be avoided by the simple expedients of extending a spring, not shown, between plates **420** and **480**, or by placing, a slight groove or depression, also not shown, at the rear extremity of **[**groove**]** *slot* **424**, whereby a slight restraint is placed on roller **427**.

While rollers rideable in slots have been described and shown, it will be understood that any appropriate slide means may interconnect the several chair components.

I claim:

1. A reclining chair adapted to be positioned in close adjacency to and forwardly of a room wall when in the upright sitting position and yet so structured as to allow ready assumption of a reclined position without physical contact with the same room wall, the reclining chair comprising:

a base, a chassis supported relative to the base,

a body-supporting unit including a seat and a back having a pivotal relationship as to each other,

a leg-supporting unit, mounting means for mounting the body-supporting unit relative to the chassis in movements between upright and reclining positions,

means for mounting the chassis relative to the base in linear movements relative to the base as the body-supporting unit is concomitantly moved,

means for mounting the leg-supporting unit relative to the body-supporting unit in movements between retracted and extended positions as the body-supporting unit is concomitantly moved,

control means for controlling the pivotal motion of the back relative to the seat as the body-supporting unit is concomitantly moved,

and means operatively connecting the body-supporting unit and base for moving the chassis forwardly and progressively away from the wall and the body-supporting unit relative to the wall as transition is made from upright sitting position toward a position of reclination and for moving the chassis rearwardly and progressively toward the wall and the body-supporting unit relative to the wall as transition is made from a position of reclination toward upright sitting position.

2. An occupant-operated living room type reclining chair positionable anywhere on a floor of a room free of attachment to the floor and in close adjacency to and forwardly of an object when in upright sitting position and yet so constructed as to allow ready assumption of any reclined position free of physical contact with the same object and comprising:

a base resting on the floor, free of permanent attachment to the floor, a chassis supported relative to the base,

a body-supporting subassembly including a seat and back having a pivotal relationship as to each other,

a leg-supporting subassembly,

control means for controlling the pivotal movements of the back relative to the seat, and

linkage mechanism operatively interconnecting the body-supporting subassembly and leg-supporting subassembly and chassis and base for, first, concurrently moving:

a. the body-supporting subassembly rearwardly relative to the chassis,

b. the leg-supporting subassembly between retracted and extended positions, and

c. the chassis relative to the base and progressively forwardly away from the object,

a transition is made from upright sitting position to a position of reclination by the occupant leaning backwardly against the back and the exerting of a forwardly pushing force against the chassis, and for, second, concurrently moving:

a. the body-supporting subassemby forwardly relative to the chassis,

b. the leg-supporting subassembly between extended and retracted positions, and

c. the chassis relative to the base and progressively rearwardly toward the object,

as transition is made from a position of reclination to upright sitting position by the occupant leaning forwardly away from the back and the exerting of a downwardly pushing force against the leg-support, with any linear movement of the body-sup-

porting subassembly relative to the base being in substantially inverse ratio to any linear movement of the chassis relative to the base.

3. A reclining chair movable by the occupant between upright sitting and intermediate-television and fully reclined positions and positionable anywhere on a floor of a room and free of attachment to the floor and in close adjacency to a wall when in upright sitting position and yet so structured as to allow ready assumption of intermediate-television and fully reclined positions free of contact with the wall comprising: a base, a chassis a body-supporting subassembly including a seat and back having a pivotal relationship as to each other, a leg-supporting subassembly, control means for controlling the pivotal movements of the seat relative to the back of the body-supporting subassembly, linkage mechanism for effecting movement of the body-supporting subassembly between upright and intermediate and reclined positions concomitant with movement of the leg-supporting subassembly between retracted and extended positions respectively and for effecting movement of both the chassis and body-supporting subassembly relative to the base in one direction responsively to and simultaneously with movement of the body-supporting subassembly relative to the chassis in counter direction.

4. A reclining chair adapted to be movable on a floor of a room and into close adjacency to and forwardly of an object when in upright sitting position and yet so structured as to allow ready assumption of a reclining position free of physical contact with the same object, the reclining chair comprising: a base, a chassis supported relative to the base, a body-supporting unit including a seat and back and leg-support having pivotal relationships as to each other, control means for controlling the pivotal movements of the seat relative to the back of the body-supporting unit, and linkage mechanism operatively interconnecting the body-supporting unit and chassis and base and leg-support for concurrently moving the chassis relative to the base and forwardly and progressively away from the object and the body-supporting unit rearwardly relative to the chassis and the leg-support of the body-supporting unit from retracted to an extended position as transition is made from upright sitting to reclination positions and for concurrently moving the chassis relative to the base rearwardly and progressively toward the object and the body-supporting unit forwardly relative to the chassis and the leg-support of the body-supporting unit from an extended to retracted position as transition is made from reclination to upright sitting positions.

5. A reclining chair adapted to be positioned on a floor more particularly in close adjacency to and forwardly of an object when in upright sitting position and yet so structured as to allow ready assumption of a reclining position without physical contact with the same object, the reclining chair comprising:

a base, a chassis supported relative to the base,

a seat and a back having a pivotal relationship as to each other, a leg-supporting unit, roller means disposed between and fixed to one of the chassis and base,

control means for controlling the pivotal movements of the seat relative to the back, and linkage mechanism operatively interconnecting the seat and back and leg-supporting unit and chassis and base for concurrently propelling the chassis relative to the base and forwardly and progressively away from the object and the seat rearwardly relative to the chassis and the leg-supporting unit from retracted to an extended position as transition is made from upright sitting position to a position of reclination responsively to an impelling force generated by the occupant upon the chassis in one direction with a resultant reaction of the seat relative to the chassis in a counter direction.

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Disclaimer

Reissue No. 29,483.—*Frank Manuel Ré*, Holyoke, Mass. RECLINING CHAIR. Patent dated Nov. 29, 1977. Disclaimer filed July 19, 1978, by the assignee, *Dual Manufacturing and Engineering, Incorporated.*

The term of this patent subsequent to Sept. 11, 1990, has been disclaimed.

[*Official Gazette August 22, 1978.*]