

March 30, 1954

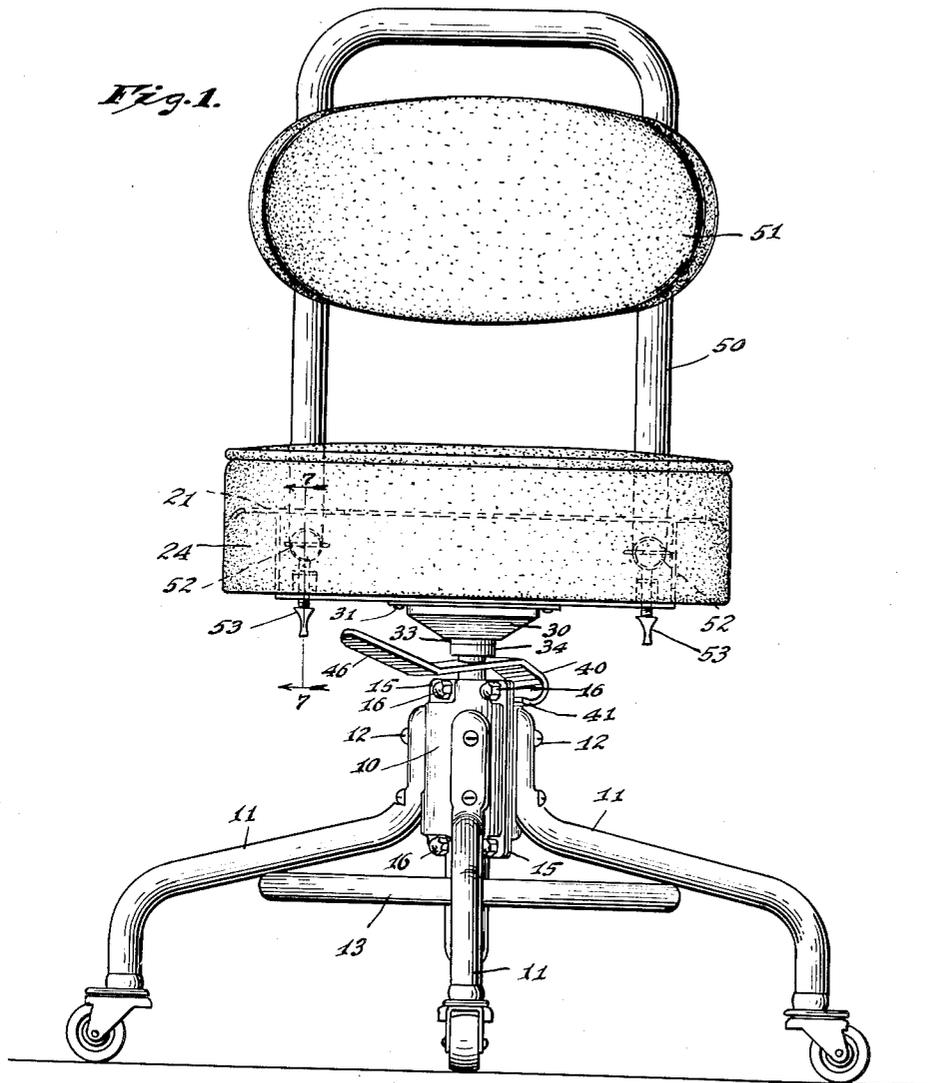
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2,673,590

VERTICALLY ADJUSTABLE PEDESTAL CHAIR

Filed July 24, 1950

3 Sheets-Sheet 1



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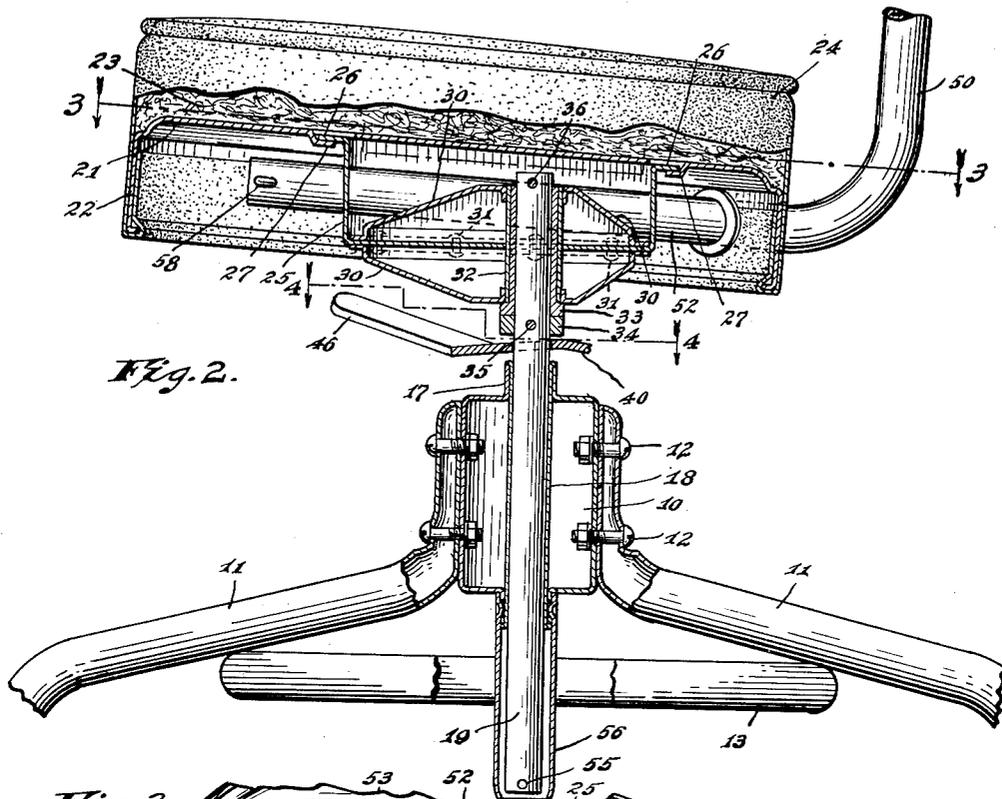


Fig. 2.

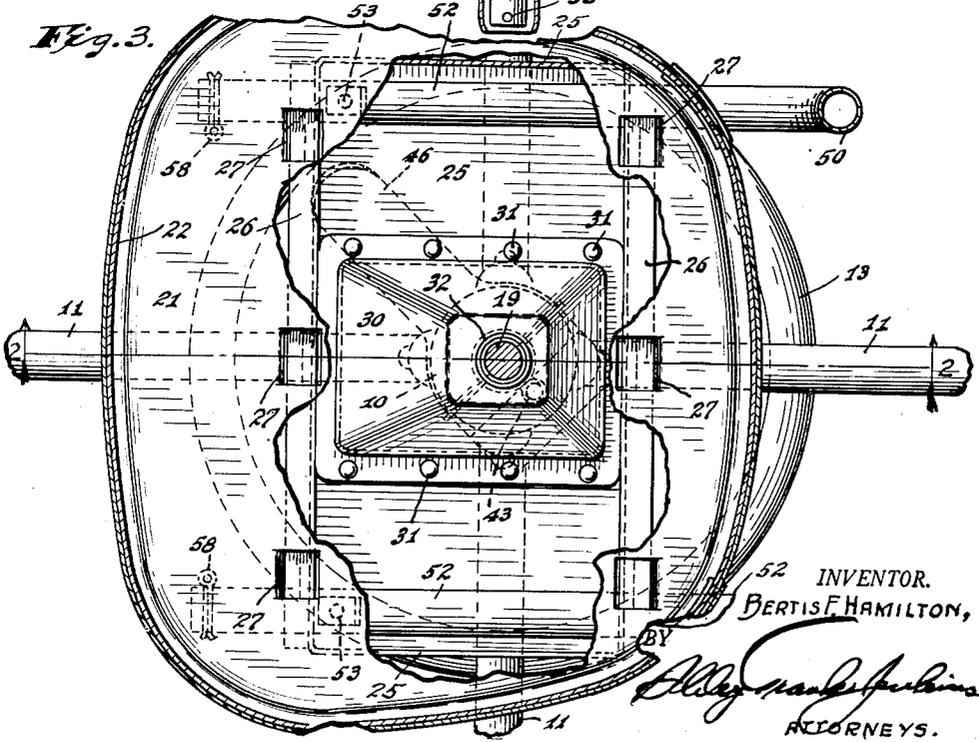


Fig. 3.

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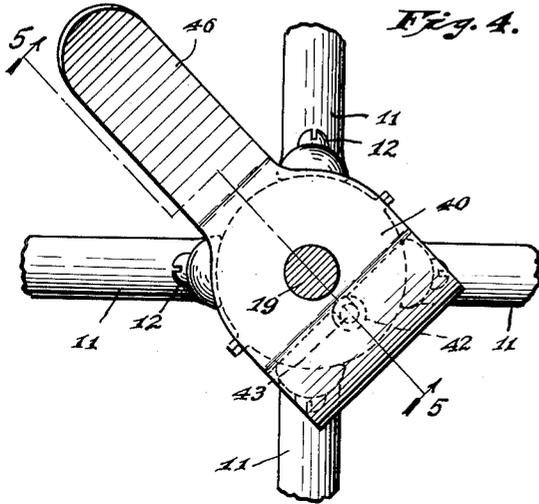


Fig. 4.

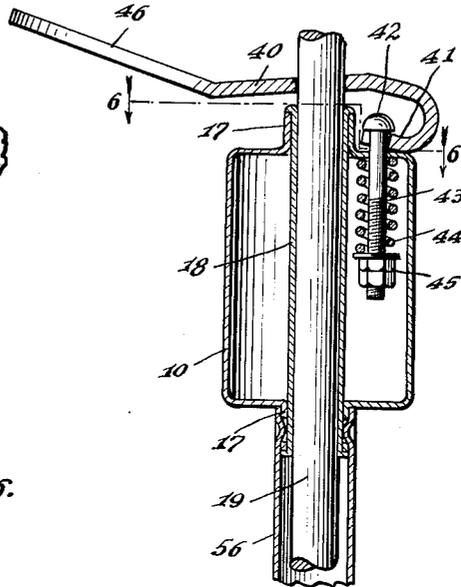


Fig. 5.

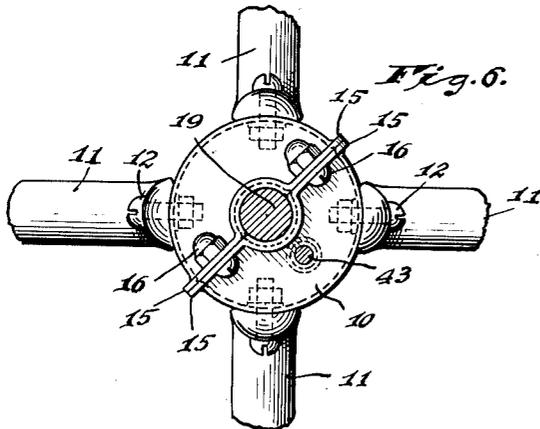


Fig. 6.

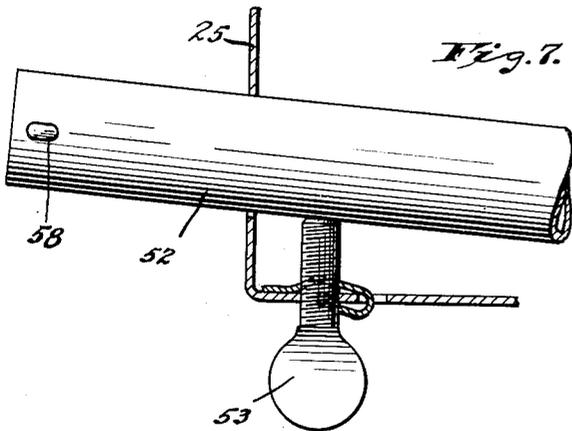


Fig. 7.

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# UNITED STATES PATENT OFFICE

2,673,590

## VERTICALLY ADJUSTABLE PEDESTAL CHAIR

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Application July 24, 1950, Serial No. 175,603

5 Claims. (Cl. 155-94)

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This invention relates to chairs, and more particularly to office chairs having swiveled, vertically adjustable seats.

It is an object of the invention to produce a chair of the type indicated which will lend itself to construction with sheet-metal and metal tubing, which can be simply and economically manufactured, which will prove sturdy and durable in use, and which will possess a pleasing appearance. Another object of the invention is to facilitate the vertical adjustment of a chair seat. Still another object of the invention is to provide an improved means for adjusting a chair-back horizontally with reference to the chair-seat.

In carrying out the invention in the preferred form, I provide for the chair a base having a central, hollow housing formed of two complementary sheet-metal stampings. Desirably the base has four legs two of which are bolted to each of such stampings, and the two stampings are then bolted together to complete a stable chair-base. Extending through the housing is a vertical guide in which a seat-supporting rod is slidably received, and on the upper end of such rod the chair-seat is swiveled. To lock the rod in any desired position of vertical adjustment it passes through a hole in a lock plate which is pivotally supported from the base on a horizontal axis offset from the rod, the arrangement being such that the downward load transmitted from the rod to the plate by frictional engagement will tend to cant the plate and increase friction between it and the rod. The chair-seat includes a cross-member having a pair of sheet-metal bearing supports in which is mounted a sleeve bearing rotatably receiving the upper end of the seat-supporting rod. A chair-back includes a back-support having two general horizontal, parallel arms which are slidably received in the aforesaid cross member, and means are provided for releasably holding such arms in any desired position of adjustment.

The accompanying drawings illustrate the invention: Fig. 1 is a front elevation of a chair in which the invention is embodied; Fig. 2 is a fragmental side elevation of the chair in partial section on the line 2-2 of Fig. 3; Fig. 3 is a horizontal section on the line 3-3 of Fig. 2; Fig. 4 is a fragmental horizontal section on the line 4-4 of Fig. 2; Fig. 5 is a vertical section on the line 5-5 of Fig. 4; Fig. 6 is a horizontal section on the line 6-6 of Fig. 5; and Fig. 7 is a fragmental vertical section on the line 7-7 of Fig. 1.

The chair illustrated in the drawing com-

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prises a base having a central housing 10 to which radial legs 11 are secured as by bolts 12. To increase the rigidity of the base and relieve the bolts 12 of strain, the legs 11 may be interconnected intermediate their radial extent by a ring-like brace 13.

As will be clear from Fig. 6, the housing 10 is formed of two complementary sheet-metal stampings having at their ends flanges 15 adapted to be clamped together by bolts 16. The legs 11 are desirably formed of metal tubing shaped at their inner ends to fit against and extend vertically along the outer surface of the housing 10. Two legs are associated with each of the sheet-metal stampings constituting the housing 10, being secured thereto by the bolts 12. After the two legs associated with each housing-stamping are secured thereto, the two housing-halves are brought together in opposed relationship and secured together by the bolts 16.

The stampings constituting the housing 10 are provided at their upper and lower ends with vertically extending, coaxial semi-circular flanges 17 which, when the housing is assembled embrace a vertical tubular guide 18 which slidably receives a seat-supporting rod 19. To locate the guide 18 axially of itself in the housing 10, it is provided at its ends with out-turned flanges which engage the ends of the flanges 17.

The chair-seat (see Fig. 2) desirably comprises a frame in the form of a sheet-metal stamping shaped to provide a generally horizontal floor 21 and an integral, downwardly extending, peripheral flange 22. Padding 23 for the seat is supported on the floor 21 and covered by a covering 24 of fabric or the like which extends downwardly over the flange 22 and around the lower edge thereof.

The frame 21-22 is supported on a cross member 25, which desirably is a box-like sheet-metal stamping having out-turned flanges 26 at the upper edges of its front and rear walls. The floor 21 rests on top of the cross member 25 and may be secured thereto through the medium of tongues 27 struck downwardly from the floor and embracing the outer edges of the flanges 26.

To the upper and lower sides of the bottom of the cross member 25 are secured oppositely disposed, dished bearing supports 30, conveniently formed as sheet-metal stampings and provided with peripheral flanges secured to the bottom wall of the cross member by rivets 31. The bearing supports 30 are provided with aligned openings receiving a tubular member 32 in which a sleeve bearing 33 is in turn received. The upper

end of the rod 19 extends through the sleeve bearing 33 to support the seat for rotation about the axis of the rod. The load on the seat is transmitted to the rod 19 through a collar 34 secured to the rod 19 as by a pin or rivet 35 and engageable with the flanged lower end of the sleeve bearing 33. A pin 36 extending through the upper end of the rod 19 above the upper end of the sleeve bearing 33 prevents removal of the seat from the rod.

To hold the rod 19 in any position of vertical adjustment in the base, and hence to hold the chair-seat at any desired elevation, I employ the clamp means illustrated in Figs. 4 and 5. Such means comprises a clamp plate 40 desirably formed of sheet metal and provided with a hole which receives the rod 19 and which is of slightly larger diameter than such rod. At one end, the material of the plate 40 is bent back on itself to provide a flange 41 spaced from the body of the plate and adapted to support the plate in rocking relationship on the upper end of the housing 10. At its center, the flange 41 is provided with a notch received beneath the head 42 of a bolt 43 which extends downwardly through the upper wall of the housing 10 into the interior of such housing, where it is surrounded by a compression spring 44 acting between the upper housing-wall and a nut 45 on the lower end of the bolt. As will be obvious from Fig. 5, the parts just described are so arranged that the spring 44, acting through the bolt 43, will tend to rock the plate 40 about the point of contact between the flange 41 and the upper wall of the housing 10, the rocking tendency being in a direction which would move downward that portion of the plate 40 containing the hole through which the rod 19 passes. The construction is further such that the spring 44 is capable of canting the plate 40 to an extent limited only by the binding of its hole with the rod 19.

Normally, the spring 44 holds the plate 40 in the position indicated in Fig. 5, in which the plate 40 is canted to bring the edges of its hole into gripping engagement with the rod 19. Downward load on the rod tends to increase canting of the plate 40 and hence to increase the binding or gripping effect of such plate on the rod. To release the rod 19 for vertical adjustment of the seat, the plate 40 is swung in a clockwise direction against the force exerted by the spring 44 until it occupies a position more nearly normal to the axis of the rod 19, when the rod 19 will be freely slidable through the hole in the plate. To facilitate this manipulation of the plate, it may be provided with an extension 46 which projects outwardly far enough to be manipulated by one or more fingers of a hand grasping the seat.

The chair shown in the drawings comprises a back support 50 to which a back 51 of any desired type is secured in any convenient manner. The support 50 is desirably a length of metal tubing bent into a general inverted U-shape and having its lower end portions 52 bent to extend forwardly in parallel relation. The horizontal portions 52 of the back support 50 extend through appropriately positioned holes in the rear side of the flange 22 and also through pairs of aligned holes in the front and rear walls of the cross member 25. The horizontally extending portions 52 are slidable in the holes which receive them, thus permitting the back 51 to be adjusted forwardly and rearwardly of the seat. To hold the back support in any desired position of fore and aft

adjustment, I may employ set screws 53 which extend through the bottom of the cross member 25 into clamping engagement with the back-support portions 52.

In assembling the chair described, the legs 11 are attached to the two halves of the housing 10 by the bolts 12, the bolt 43 and spring 44 are assembled with the one half of the housing 10, and the housing-halves are clamped together by the bolts 16, the tubular guide 18 being inserted between the two housing-halves to be clamped in position by tightening of the bolts 16. The two bearing supports 30 are secured to the cross member 25, the sleeve bearing 33 is put in place, the rod 19 with the collar 34 secured to it is inserted into the sleeve bearing from below, and the pin 36 is put in place to prevent withdrawal of the rod. The stamping 21—22 with the tongues 27 bent downwardly to clear the flanges 26, is positioned on the cross member, and the tongues 27 are then bent into the positions shown in Fig. 2 to embrace the edges of the flanges 26 and secure the seat and cross-member 25 together. The upholstery may be applied to the seat either before or after its assembly with the cross member 25.

When the seat and base sub-assemblies are to be united, the head 42 of the bolt 43 is elevated against the force of the spring 44, and the notched flange 41 of the clamp plate 40 is inserted beneath the bolt head. With the plate-extension 46 held elevated to bring the body of the plate 40 into a position approximately normal with the axis of the guide 18, the rod 19 is lowered through the hole in the plate and through the guide 18 until its lower end projects below the bottom of the guide 18. To prevent inadvertent separation of the seat and base sub-assemblies, a transverse pin 55 (Fig. 2) may be mounted in the lower end of the rod 19 with its ends projecting therefrom. If desired, the housing 10 may be provided with a tubular extension 56 secured in any convenient way to the lower housing-flanges 17 and extending downwardly to conceal the lower end of the rod 19 and the pin 55 therein.

The back and back support may be mounted on the seat either before or after the seat is applied to the base. In mounting the back support on the seat, the horizontal portions 52 of the support are passed forwardly through the holes in the rear side of the seat-flange 22 and through the aligned openings in the front and rear walls of the cross member 25. A transverse pin 58, similar to the pin 55, may be provided in each of the horizontal portions 52 of the back support to prevent inadvertent withdrawal thereof from the cross member.

After assembly of the seat and base, the spring 44 acts as above described to cant the plate 40 away from a position of perpendicularity with respect to the rod 19, whereby to cause the edges of the hole in the plate to grip the rod frictionally and thus support the weight of the seat. When a load is applied to the seat, the downward force transmitted to the plate 40 from the rod 19 tends to cant the plate even further, thus increasing the rod-gripping tendency. When it is desired to change the elevation of the seat, the occupant of the chair grasps the edges of the seat on each side with a finger of one hand disposed beneath the plate-extension 46. With the seat temporarily relieved of load, the plate-extension 46 is raised by the finger engaging it to bring the body of the plate into a substantially hori-

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zontal position, thus permitting free vertical movement of the rod 19 and adjustment of the seat to the desired elevation. When the seat has been brought to the desired elevation, the plate-extension 46 is released, thus permitting the spring 44 to swing the plate 40 into a position where it grips the rod 19.

I claim as my invention:

1. In a chair of the type described, a base having an upper wall, a vertical rod slidable longitudinally of itself in said base, a seat mounted on said rod above the base, and a lock member rockably resting on said upper wall for swinging movement about a horizontal axis spaced laterally from said rod, said lock member having a rod-receiving opening slightly larger than said rod whereby the rod may slide freely in the opening when the axes of the rod and opening are coincident, said lock member being downwardly swingable to cause the edges of the opening to grip the rod, said wall having an opening, a tension member extending through said opening and connected to said lock member between the rod and the point at which the lock member engages said wall, and a coiled compression spring located below said wall and acting between it and said tension member to urge the latter downwardly.

2. In a chair of the type described, a base comprising a vertically split, two-part, hollow housing having upper and lower end walls, radial legs having inner ends extending upwardly along the sides of said housing, a vertical tubular guide extending axially through said housing, means securing said inner leg-ends to the housing, means for clamping the two housing-parts together about said guide, a rod vertically slidable in said guide, a seat on the upper end of said rod, releasable lock means supported from said housing for holding said rod in fixed axial position, and a spring disposed inside said housing and urging said lock means to operative position.

3. The invention set forth in claim 2 with the addition that said lock means comprises a lock member having a downwardly retroverted end portion resting on the upper wall of said housing,

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said member having an opening in which said rod is received, said member being rockable downwardly about the point of engagement between its end portion and the upper housing wall to cause the edges of the opening to grip the rod, said end portion and upper housing-wall being provided with aligned openings, and a bolt extending through said openings, said spring being a helical compression spring surrounding said bolt.

4. In a chair of the type described, a base, a vertical rod slidable longitudinally of itself in said base, a seat mounted on said rod above the base, a lock member having an opening receiving said rod, said member having a downwardly retroverted end portion engaging said base at a point spaced from said rod and being downwardly rockable about such point to cause the edges of the opening to grip the rod, said end portion being provided with an opening between the rod and the point at which it engages the base, and a rigid element extending generally vertically through said second opening and into the base for preventing said member from rotating relative to the base about the axis of said rod.

5. The invention set forth in claim 4 with the addition of a compression spring acting between said rigid element and said base and to urge said member downwardly.

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