April 24, 1934. G. E. FROELICH 1,956,546

DRAWING TABLE

Filed April 6, 1931 4 Sheets-Sheet 1

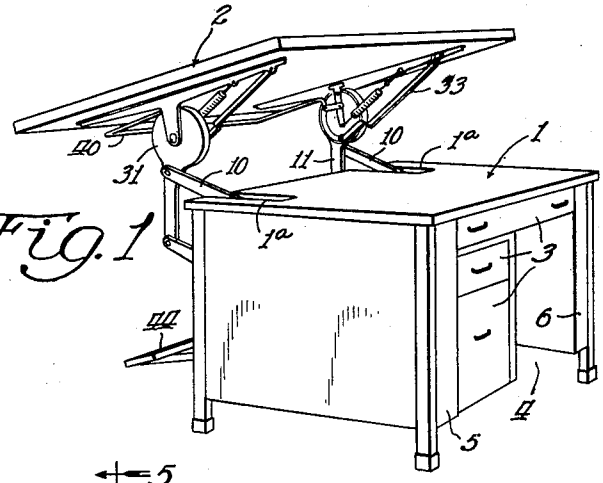


Fig. 1



Fig. 2

Inventor
George E. Froelich
By Raymond Morse
Atty.

April 24, 1934. G. E. FROELICH 1,956,546

DRAWING TABLE

Filed April 6, 1931 4 Sheets-Sheet 2

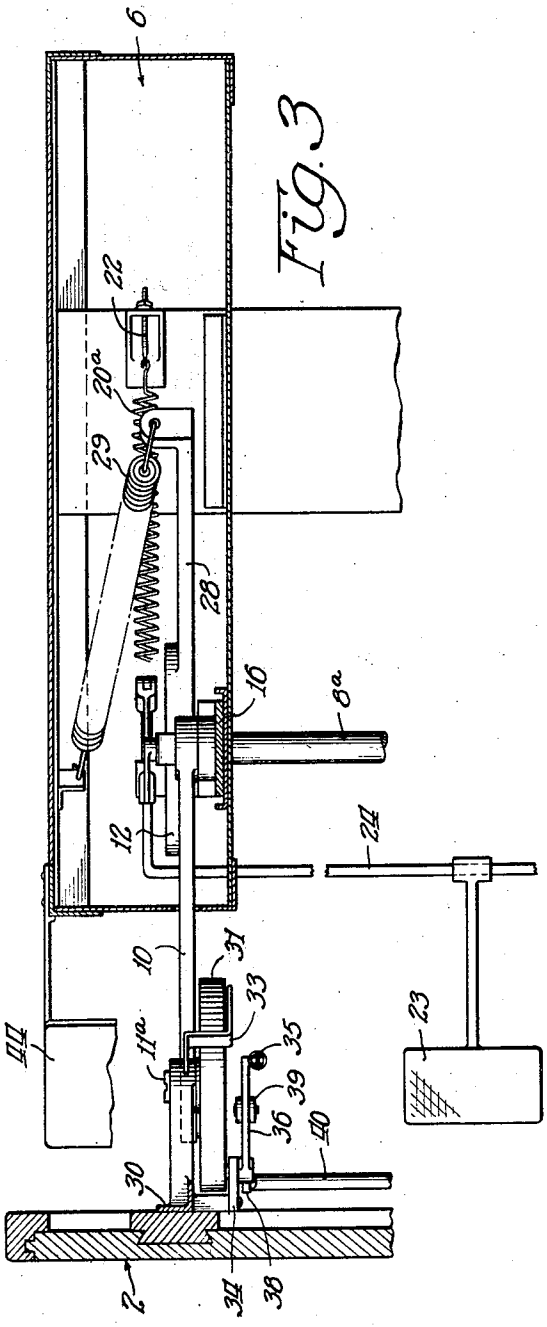


Fig. 3

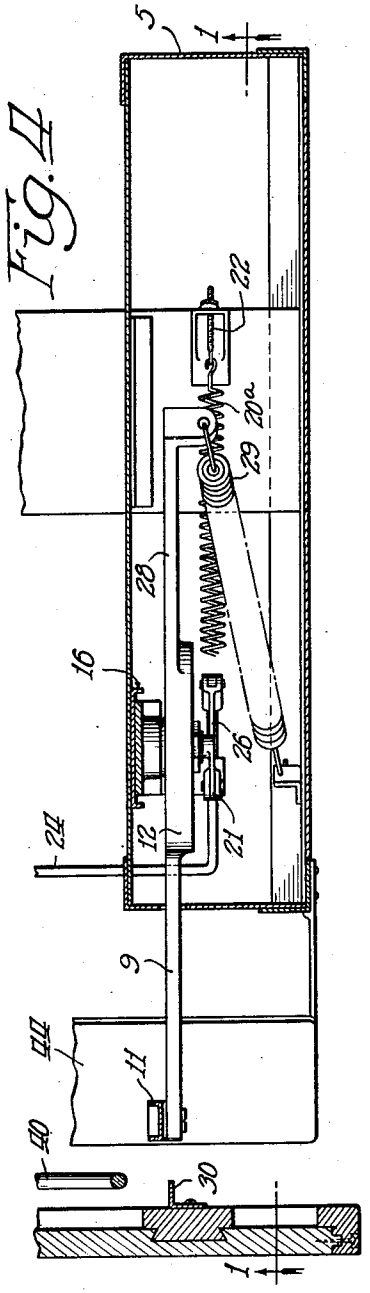


Fig. 4

Inventor
George E. Froelich
By Langdon Mann
Attys.

April 24, 1934. G. E. FROELICH 1,956,546

DRAWING TABLE

Filed April 6, 1931 4 Sheets-Sheet 3

Fig. 6

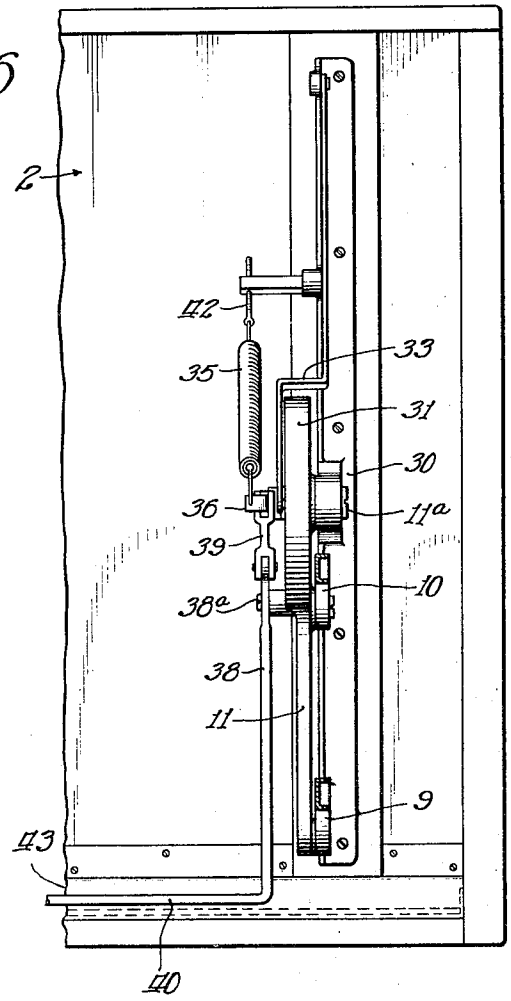
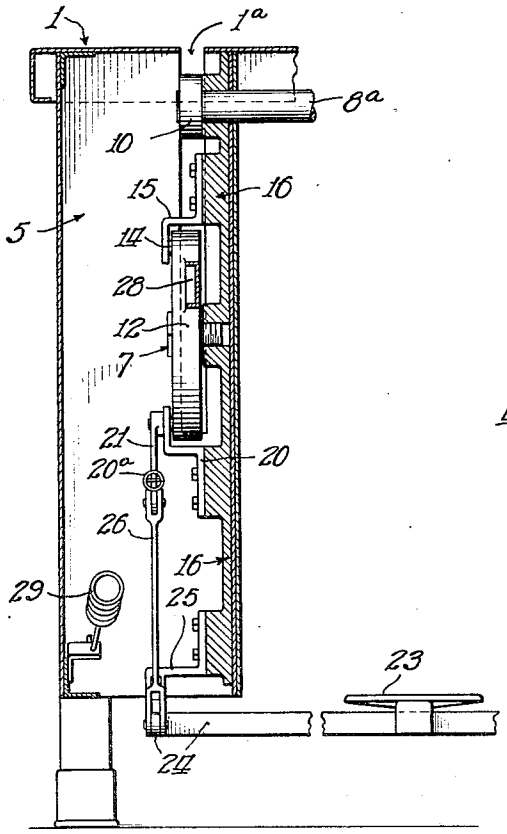



Fig. 5




Inventor
George E. Froelich
By Rauzen Mrm
Atty.

April 24, 1934. G. E. FROELICH 1,956,546

DRAWING TABLE

Filed April 6, 1931 4 Sheets-Sheet 4

Fig. 7

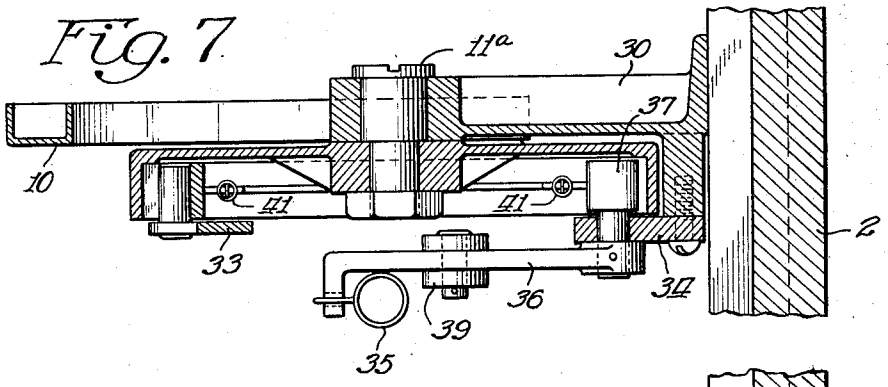



Fig. 9

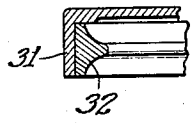



Fig. 8




Inventor
George E. Froelich
By Lawson Mann Otis

Patented Apr. 24, 1934 1,956,546

# UNITED STATES PATENT OFFICE

1,956,546

## DRAWING TABLE

George E. Froelich, Two Rivers, Wis., assignor to Hamilton Manufacturing Company, Two Rivers, Wis., a corporation of Wisconsin

Application April 6, 1931, Serial No. 527,887

6 Claims. (Cl. 45—131)

This invention relates to drawing tables or the like, and, among other objects, aims to provide a combined drawing board and desk which may be used simultaneously.

The drawing board is pivoted to the desk so as to be spaced therefrom and is easily and readily adjustable to any desired angular relationship with the desk or base. My improved construction permits the drawing board to be used in a vertical position, as well as in a horizontal position, or variations therebetween, and is desirably inclusive of simultaneously operable mechanism for securing the parts in said relative adjustment.

My invention may be understood and other objects will be apparent by reference to the illustrative embodiment shown in the accompanying drawings, in which—

Figure 1 is a perspective view of a combined drawing board and desk embodying my invention;

Figure 2 is a side elevation showing the associated mechanism, with the drawing board and desk partially in section;

Figure 3 is a partial plan section taken on the line 3—3 of Figure 2 and showing one end of the desk;

Figure 4 is another partial plan section taken on the line 4—4 of Figure 2 and showing the other end of the desk;

Figure 5 is a vertical section taken on the line 5—5 of Figure 2 and showing the same end of the desk shown in Figure 4;

Figure 6 is a vertical section taken on the line 6—6 of Figure 2 and showing a portion of the back of the board;

Figure 7 is a plan section taken on the line 7—7 of Figure 8;

Figure 8 is a fragmentary side elevation taken as an enlarged reverse view of Figure 2; and

Figure 9 is a section taken on the line 9—9 of Figure 8 and showing the clutch contact.

Referring in detail to the drawings, I have shown, in general, a base, such as the desk 1, constructed preferably of metal, and a drawing board 2 pivotally mounted thereon. The desk 1 has, in its front, drawers or the like as indicated at 3 and a knee aperture such as 4. The drawing board is mounted on the desk at its rear to face in a direction away from the front of the desk, so that the drawing board and the desk may be simultaneously used by different persons, for example, thus saving floor space. To facilitate such use the drawing board is arranged to be spaced from the top of the desk.

At each end of the desk may conveniently be left compartments generally shown at 5 and 6 in which may be housed mechanism for adjusting the position of the drawing board.

In the illustrative construction, I have shown, within each compartment at each end of the desk and hinged thereto by means of pivots 7 and 8, two links 9 and 10. The pivot 8 may be upon a rod 8a which extends from one of the compartments to the other, thus desirably reinforcing the structure (Figures 3 and 5). Slots 1a in the compartments 5, 6, permit the links 9, 10 to project therefrom.

The free ends of the lings 9, 10 are hingedly connected together by a strut 11 so that the links 9, 10 can be swung parallel to each other on the pivots 7, 8. The strut 11, which carries a pivot 11a for the drawing board 2, is thus movable upwardly or downwardly and may be locked in any desired vertical position within the range of its movement, by means of a friction clutch mechanism associated with one or more of the links.

As best seen in Figures 1, 3 and 4, there may be two sets of links 9 and 10, and associated mechanism, one set being located at each end of the desk and each set being the substantial duplicate of the other but in reversed complementary arrangement. By means of such mechanism, the angular relation of the links to the base may be adjusted at will.

Referring in particular to Figure 2, which shows compartment 5 and its enclosed mechanism, at one end of the desk, I have shown the link 9 enlarged in the region of its pivot point to form a cylindrical brake drum 12. Located within the brake drum 12 and arranged to have frictional engagement with the inner periphery thereof, is a generally circular metal brake band 13. At the upper side of the drum 12, the brake band 13 is supported by a pin 14 carried by a bracket 15 which may be screwed to a carrier plate 16 appropriately mounted upon the wall of the compartment 5. The brake band 13 has some inherent flexibility and may have its flexibility enhanced as for example by being partially split at 17. The brake band is fully split at 18 and is normally held expanded to have frictional engagement with the drum 12, by means here represented as an elliptical cam 19 which is pivoted upon a bracket 20 also attached to the carrier plate 16 and which also assists in maintaining the brake band in position in the drum 12. The cam 19 being longer in one direction than the other is thus adapted, by being rotated in one direction on its horizontal axis, to press the brake band against the drum 12 and thus to

prevent the drum from rotating. This in turn, prevents movement of the links 9 and 10 and the connecting strut 11 and holds the strut 11 in a given vertical position. The cam 19 is normally held in such locked position by the tension of a coil spring 20*a*, appropriately anchored at one end to a fixed portion of the desk and having its free end hooked to an arm 21 which is rigidly connected to the cam 19 and is adapted to rotate the cam. The tension of the spring 20*a* may conveniently be adjusted by a screw bolt 22 at its anchored end.

When it is desired to move the strut 11 to vary the vertical position of the pivot 11*a* of the board 2, the above described clutch mechanism may be released, preferably by a pedal which controls the clutch mechanisms at both ends of the desk simultaneously. I have here shown the pedal 23 conveniently located for operation by the foot of the draftsman, for example and mounted upon a forked lever 24 extending to each end of the desk. One fork of the lever 24 is pivoted, for example, upon a bracket 25 screwed to the carrier plate 16 and is continued beyond this pivot to be hingedly secured to one end of a link 26. The other end of the link 26 is hingedly secured to the arm 21, which, as before described, is rigidly connected to and is in rotatable relation with the cam 19. When the pedal 23 is depressed, the cam 19 is thus rotated, against the tension of the spring 20*a* and in a reverse direction, a slight but sufficient distance to release the pressure of the cam upon the free ends of the brake band 13, and permit rotation of the drum 12 and, in turn, movement of the links 9, 10 and strut 11. Relatively light coil springs 27, hooked across the segments of the brake band 13, supplement the resiliency of the band to effect its contraction away from the drum 12 to the extent permitted by the cam 19.

When the pedal 23 is depressed, in order that the drawing board 2 shall be prevented from dropping and may be raised, for instance, with a slight pressure of the hand, I provide means for counterbalancing the drawing board and its associated mechanism. In the present exemplification of the invention, I have shown the drum 12 extended upon its side opposite the strut 11 to provide an integral arm 28 to which is hooked the free end of a relatively heavy coil spring 29. The arm 28 is desirably about as long as the link 9 to enhance the effectiveness of the spring 29 by relatively long lever arm action. The spring 29 is anchored at its other end to a stationary part of the desk 1, and when the brake is released, the tension of the spring 29 is such as to counterbalance the weight of the drawing board and its associated mechanism and maintain the parts in equilibrium. It will be understood, as already explained, that, as here shown, there are two of the springs 29, one at each end of the desk. If desired the tension of the spring 29 may be such as to have a tendency to move the board 2 slowly upward when the clutch mechanism is released.

In order to adjust not only the angular relation of the links 9 and 10 to the desk 1, (and thus the height of the strut 11) but also the angular relation of the board 2 to the strut 11, I provide means for pivoting the drawing board to the strut and clutch mechanism associated therewith, for maintaining a given angular relationship therebetween.

In this instance, the board 2 is rigidly mounted upon a frame 30 which is pivoted to the strut 11 at 11*a*. The top of the strut 11 is shown having an integral enlargement which forms a cylindrical drum 31 concentric with the pivot 11*a*, and about which the frame 30 (with the board 2 thereon) may have an orbital or rotative movement.

It will be here necessary to describe only one of the sets of mechanism associated with the drum 31, it being understood that there may be, as here shown, a set at each end of the board, one set being a duplicate of the other but in reverse, complementary position.

As best shown in Figure 8, a brake band 32, similar to the band 13, is adapted to contact with the inner periphery of the drum 31, but in this instance, the brake band moves with the frame 30. To effect this movement with the frame, the brake band 32 is supported at one side by a brace 33, which is connected at one end to the brake band and at the other end to the frame 30, preferably near the margin of the board. At its opposite side the brake band is supported upon a bracket 34, also carried by the frame 30. (Figures 7 and 8.)

Rotation of the frame 30 and the brake band 32 with respect to the drum 31 is normally prevented by the tension of a coil spring 35 which is anchored at one end to the frame 30 and has its free end hooked to an arm 36 which is pivoted in the bracket 34 and is adapted to rotate an elliptical cam 37 similar to the cam 19. Under the tension of the spring 35, the cam 37 is normally rotated to press the free ends of the brake band 32 apart and thus expand the brake band against the inner periphery of the drum 31 locking the brake band and the drum by this frictional engagement. When it is desired to rotate the frame and brake band with respect to the drum and thus adjust the angular relation of the drawing board to the strut 11, a bell crank lever may be manipulated for instance by hand. The lever 38 is pivoted on the frame 30, as at 38*a*, and is hingedly connected to one end of the link 39, which has its other end hingedly connected to the arm 36. By pulling the handle 40 of the lever 38 toward the board 2, the cam 37 is rotated sufficiently against the force of the spring 35, and in a reverse direction, to release the pressure of the cam on the brake band 32, which permits the brake band and the frame 30 to turn. The handle 40 desirably connects both of the levers 38, thus extending substantially across the board to be readily accessible. Relatively light coil springs 41, hooked across the segments of the brake band 32, supplement the resiliency of the band to effect its contraction away from the drum 31 to the extent permitted by the cam 37.

A screw bolt 42 permits of adjusting the tension of the spring 35.

A pencil trough 43 (Figure 2) may be arranged to depend from the lower margin of the board 2, and a foot rest 44 desirably projects from the desk 1 and is rigidly positioned below the board 2.

A stop 45 on the drum 31 desirably limits the downward movement of the strut 11, by engaging the link 10.

So constructed and arranged, the board may be adjusted to a suitable height for standing position or for sitting position at the height of an ordinary chair, and at any desired angle of inclination. The mechanism is very nearly automatic and is simple to operate. No time consuming adjustments need to be made, and the hand and foot adjustments may be made simultaneously and with very little effort. Further-

more, the mechanism is kept clear of the top of the desk, permitting use of the desk as a reference desk, since the drawing board is spaced therefrom at all times.

Obviously the invention is not limited to the specific details of construction described above for illustration. Furthermore, it is not indispensible that all the features of the invention be used conjointly, as they may be advantageously employed in various combinations and sub-combinations.

Having described one embodiment of my invention, I claim:

1. In a device of the class described, the combination with a base, of links pivotally connected thereto, a counterbalancing spring connected with one of the links, a strut connecting one end of the links and maintaining them in parallel relation, said strut being adapted to move downwardly against the action of the counterbalancing spring, friction clutch mechanism associated with one of the links and the base and adapted to adjust the angular relation of the links to the base at will, a pedal for controlling said clutch mechanism, a drawing board or the like, a frame rigidly attached to the drawing board and pivoted to the strut, friction clutch mechanism associated with said strut and said frame and adapted to adjust the angular relation of the board to the strut, and a hand lever for controlling said latter clutch mechanism.

2. In a device of the class described, the combination with a base, of a drawing board or the like pivotally connected thereto, spring controlled friction clutch mechanism adapted to adjust the angular relation of the board to the base at will, and a relatively heavy spring counterbalancing said board when the clutch mechanism is released, said spring operating upon a relatively long lever arm.

3. In a device of the class described, the combination with a base, of a link pivotally connected to the base, resilient friction clutch mechanism associated with said link and said base for adjusting the angular relation of the link to base, a drawing board or the like pivotally connected to said link, friction clutch mechanism for adjusting the angular relation of the board to link, and spring means for counterbalancing the weight of said board and link when the first mentioned clutch mechanism is released including a spring connected with a relatively long lever arm integral with and oppositely directed from said link.

4. In a device of the class described, the combination with a base, of links pivotally connected thereto, a strut connecting one end of the links and maintaining them in parallel relation, a drum rigidly connected with one of the links, friction clutch mechanism associated with said drum for adjusting the angular relation of the link to the base, a spring normally maintaining said clutch mechanism in operative relation with said drum, a lever pivoted to said base and adapted to release said clutch mechanism against the force of the spring, an extension of said drum on the opposite side of said pivot point from the strut, a counterbalancing spring connected to the base and to said extension whereby the strut is adapted to move downwardly against the force of the counterbalancing spring, a drum integral with the upper end of the strut, a drawing board or the like, a frame rigidly attached to the drawing board and pivoted concentrically with said drum, friction clutch mechanism associated with said bracket and said drum for adjusting the angular relation of the board to the strut, a spring connected to said frame and adapted to normally maintain said latter clutch mechanism in operative relation with said latter drum, and a lever for releasing said latter clutch mechanism.

5. In a device of the class described, the combination with a desk, of a drawing board and mechanism connected to the rear of said desk for supporting the drawing board in pivotal connection therewith, said board being arranged to face away from the front of said desk and to be spaced from said desk top, whereby the drawing board and desk may be used simultaneously counterbalancing means for said board and mechanism and a compartment within the desk for housing said counterbalancing means.

6. In a device of the class described, the combination with a desk; of a drawing board; mechanism connected to the rear of said desk for supporting the drawing board in pivotal connection therewith; a plurality of brake drums associated with said mechanism; a plurality of spring actuated counterbalancing means for said board and mechanism; and compartments at each end of the desk for housing each of said brake drums and counterbalancing means.

GEO. E. FROELICH.