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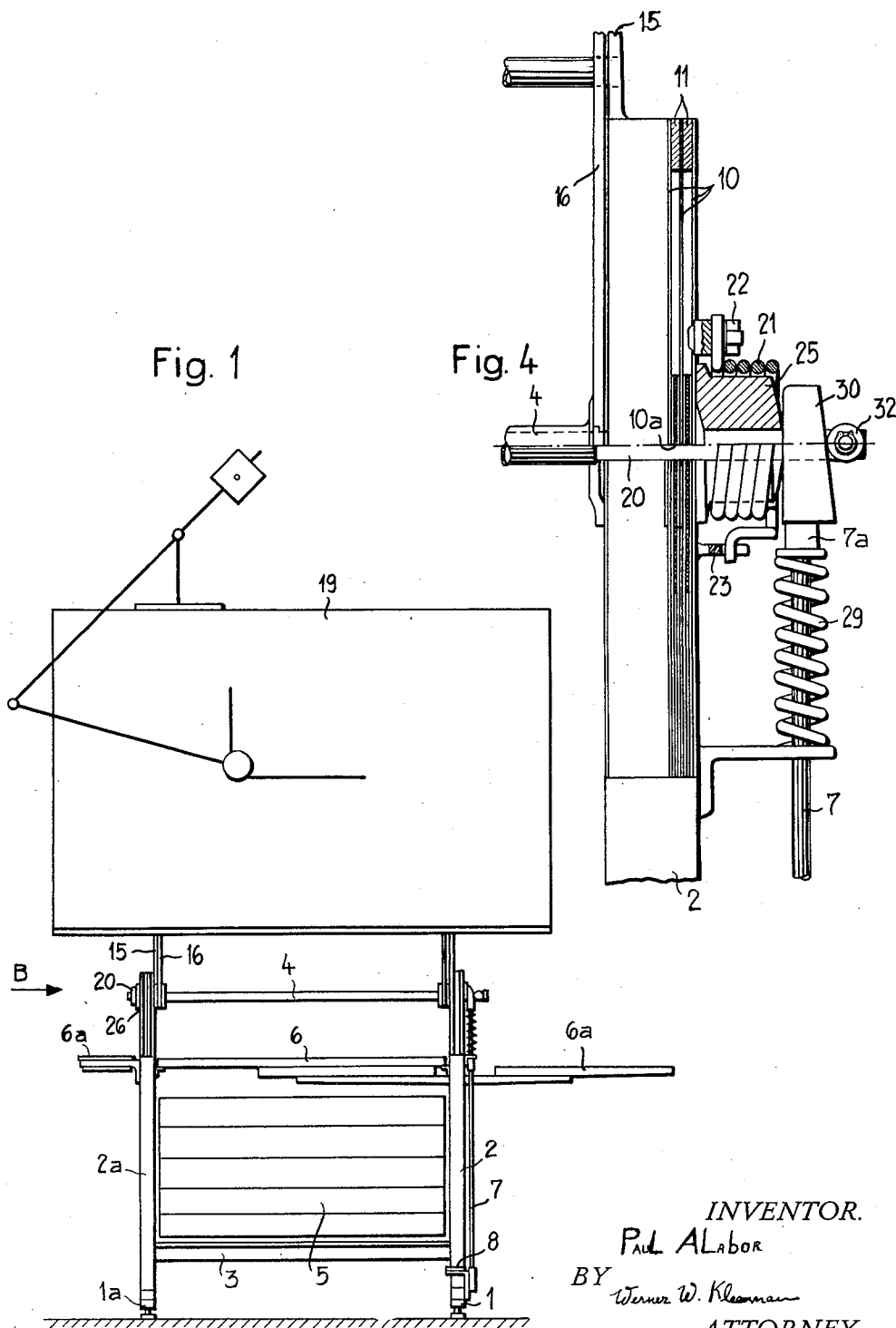
P. ALABOR

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DRAWING STANDS OR THE LIKE

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Fig. 2

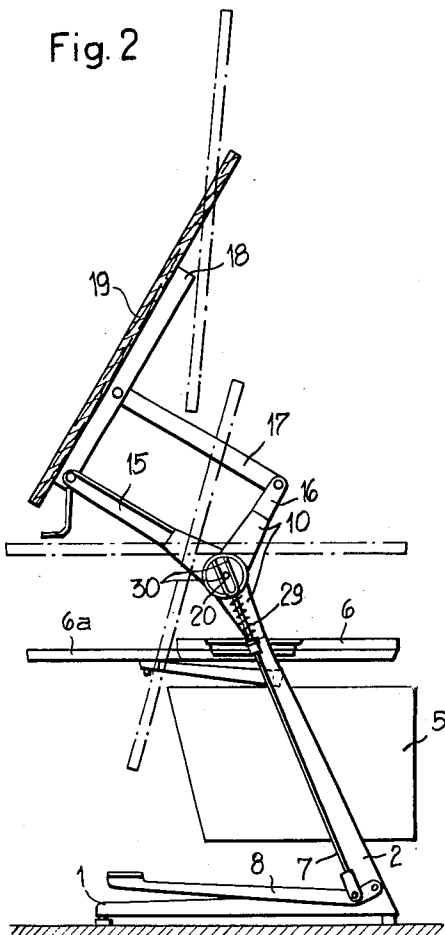
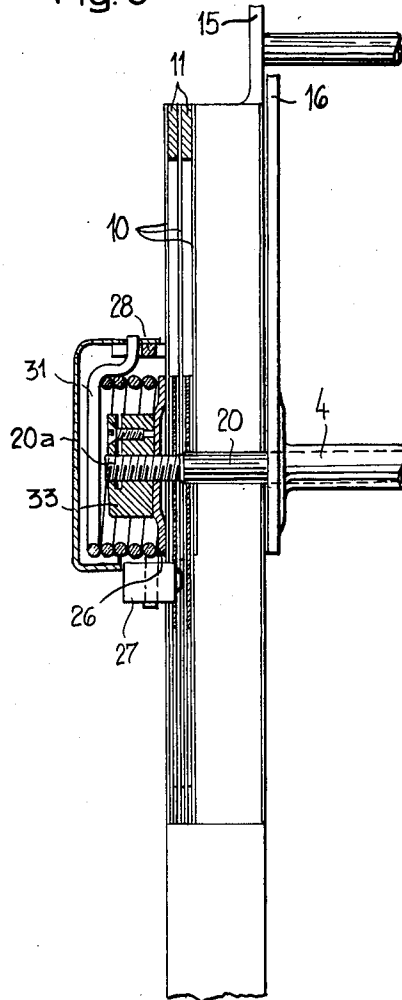


Fig. 6



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Fig. 3

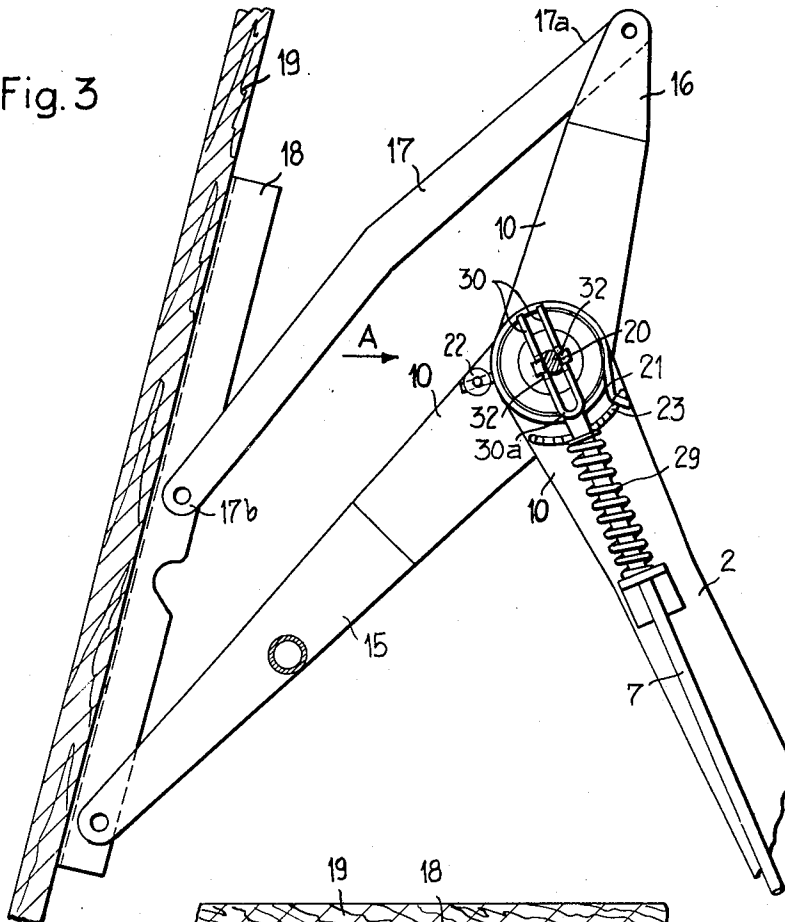
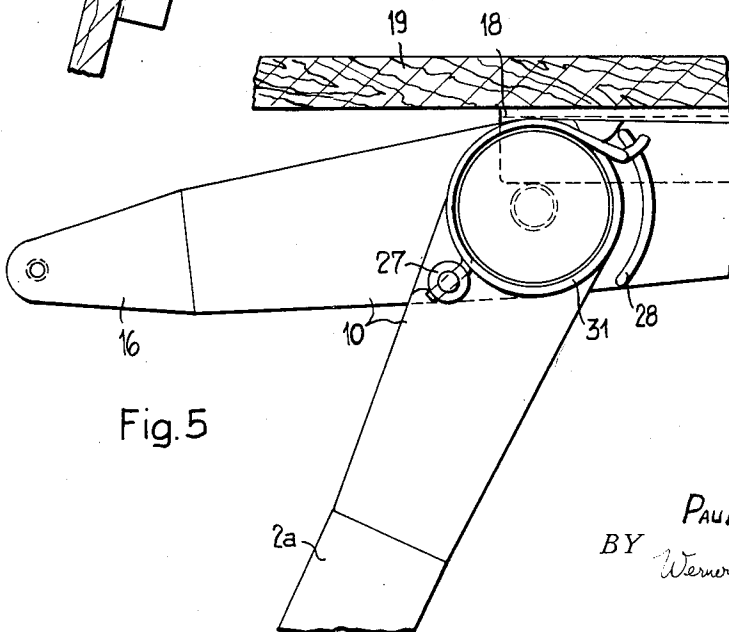


Fig. 5



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DRAWING STANDS OR THE LIKE

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The present invention relates to an improved and novelly constructed drawing table or stand of the type having an adjustable drawing board which may be variably positioned as regards both elevation and inclination. Drawing stands having adjustable boards are generally known to the art. In the known constructions, the drawing board is generally balanced by a counterweight arranged between the feet or legs of the stand. When the board is moved downwards, the counterweight is caused to move upwards. Thus, the movable counterweight requires additional space for its path of travel. Moreover, drawing stands of such construction are heavy and awkward to adjust or transport. Whenever such drawing stands are aligned in rows, much useful space is wasted as it is necessary to leave between every two drawing stands a relatively wide space, which could otherwise be gainfully employed.

In the drawing stand designed according to the present invention no counterweight is necessary as such is replaced by torsion springs. The unobstructed space thus gained between the legs of the stand can therefore be used to accommodate shelves and/or a work cabinet. With the counterweight eliminated, the stand is easier to transport and adjust, and persons standing behind the board are not obstructed by an arm or a weight.

The drafting table or stand according to the present invention is characterized by the fact that a table top is adjustably supported as regards elevation and inclination by lever means arranged in the form of a parallelogram, the lowermost corner remote from the underside of said table top is pivotably arranged on a pivot shaft. The two legs of the parallelogram forming said lowermost corner are provided with friction plates or laminae which are intergrippingly engageable with similar laminae carried by a respective leg member of the support stand for the drafting table. Additionally, clamping means for frictionally engaging the intergripping laminae packets are provided which are controlled in operation by a suitably arranged bifurcated member and cooperable foot lever. Moreover, spring means are coaxially arranged with respect to said clamping members serving to counterbalance the weight of the pivotable table assembly.

Accordingly, it is an important object of the present invention to provide a drafting table assembly which is relatively inexpensive to manufacture, easy to adjust in respect to elevation and inclination, relatively light-weight in construction, and capable of assuming a large number of positions.

Another important object of the present invention is to provide a drawing board structure which is easy to adjust, compact in structure and highly stable once set to assume a desired position.

Still a further object of the present invention is to provide a drafting board assembly usable as a table by virtue of being able to be lowered to a comfortable height and capable of supporting relatively large pressures.

A further important object of the present invention is to provide means for positively retaining an adjustable table in a preset position and for counterbalancing the weight of said table, which means are coaxially arranged.

Yet a further primary object of the present invention is to provide a drawing stand overcoming the disadvantages of the known constructions mentioned hereinabove, which stand includes at least one parallelogram arrangement having a lowermost corner remote from the table

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top proper pivotably carried by a support base, and wherein at least one torsion spring is provided which balances the weight of the table top.

These and still further objects and the entire scope of applicability of the present invention will become apparent from the detailed description given hereinafter; it should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

In the drawings:

FIGURE 1 illustrates a front view of a drawing stand designed according to the present invention;

FIGURE 2 is a side view of the drawing stand shown in FIGURE 1;

FIGURE 3 is an enlarged detailed representation of an assembly shown in FIGURE 2, in a different adjustment position for the drawing stand;

FIGURE 4 illustrates a fragmentary view, partly in section, of a clamping device taken in the direction of the arrow A shown in FIGURE 3;

FIGURE 5 is a fragmentary view taken in the direction of the arrow B shown in FIGURE 1 and illustrating a clamping device for the drawing stand; and

FIGURE 6 is a fragmentary view, partly in section, of the clamping device shown in FIGURE 5.

Referring now to the drawings, the drawing stand depicted in FIGURES 1 and 2 is supported upon a pair of support or base bars 1, 1a arranged parallel to each other. Connected to each of said base bars 1, 1a at an acute angle thereto are the respective legs or shanks 2, 2a which extend in an upward direction. Laterally connected between the legs 2, 2a is a brace member or cross-bar 3, and arranged above said brace member and between said legs 2, 2a is a case or cabinet 5 provided with drawers or shelves, as well as a separate tray 6. Also carried by the legs 2, 2a are pivotable shelves 6a which are situated between the case 5 and the tray 6. Pivotably connected at a region adjacent the lower end of the leg 2 for example is a horizontally extending foot actuatable lever 8 which is connected to a rod or bar member 7 extending towards the upper end of the leg 2.

Connected to the upper end of each of the legs 2, 2a are several thin sheets or laminae 10 which are parallelly positioned with respect to each other and spaced a certain distance from one another. The distance between every two adjacently arranged laminae 10 is about double the laminae thickness, and is maintained by means of the spacers 11, as best illustrated in FIGURE 4. Each of the laminae 10 is provided with bores 10a which are coaxially positioned and serve as bearings for a clamping bar 20.

Pairs of lever arms 15, 16 are pivotably connected by means of the clamping shaft or bar 20 to the upper end of the legs 2, 2a respectively, as shown in FIGURES 3 and 4. Extending parallel to each of the longer lever arms 15 is a respective lever arm 17 which is pivotably connected at one end 17a to its associated shorter lever arm 16 and at the other respective end 17b to one of a pair of bracket members 18. Secured to the pair of spaced bracket members 18, which are positioned parallel to the pair of lever arms 16, is a drawing board or top 19 supported by the longer pair of lever arms 15 connected to the pair of bracket members 18. Instead of employing a pair of bracket members 18, it is also equally possible to provide a frame capable of adjustably accommodating the drawing board. The respective pairs of lever arms 15, 16, 17 and the associated pair of bracket members 18, arranged adjacent opposite ends of the drawing board 19, together form two spaced and movable parallelo-

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gram arrangements which are connected at one end to the respective legs 2, 2a and at the other end to the drawing board 19. It is to be appreciated that by securing the respective parallelogram lever groupings at the lowermost corner remote from the underface of the drawing board 19 maximum adjustability of said board as regards height and inclination is possible.

The ends of each of the lever arms 15, 16 extending towards the clamping bar 20 are similarly provided with banks of thin sheets or laminae 10 analogous to the laminae 10 provided for the upper ends of the legs 2, 2a. The pair of lever arms 16 are further provided with a hollow connecting tube 4 coaxially arranged with respect to the bores 10a of the laminae 10 and serves to interconnect the two lever arms 16.

With the drawing stand in assembled condition, the laminae 10 of the pairs of lever arms 15, 16 are arranged to engage between the laminae 10 of the shanks 2, 2a, as illustrated in FIGURES 4 and 6, with all the bores 10a of the respective laminae 10 positioned on a common axis. Owing to the fact that the distance equals two lamina thicknesses, one lamina is in surface contact with the other. For the sake of simplicity in illustration, FIGURES 4 and 6 only illustrate a portion of the laminae 10, which are evenly distributed throughout the width of the legs 2, 2a. The clamping bar 20 passes through the bores 10a of each of the laminae 10 and internally of the hollow connecting tube 4, in such a manner that the pairs of lever arms 15, 16 are pivotably connected to the legs 2, 2a. The clamping shaft or bar 20 projects in the direction of both ends of the drawing stand and beyond the bank of laminae 10. Pressure exerting members such as clamping jaws 25, 26 serving to frictionally engage the laminae 10 with one another are slidably mounted on the projecting stub portions of the clamping bar 20. The clamping bar 20 is further provided at one end with a threaded portion 20a (FIGURE 6) and at the other end with at least one roller member 32 (FIGURE 4), with the axis of said roller member positioned at right angles to the axis of the clamping bar or shaft 20.

Interposed between the roller member 32 and the adjacently arranged clamping member or jaw 25 is a wedge member 30 secured to the upper end 7a (FIGURE 4) of the rod 7 and which is urged in upward direction by a coil spring 29.

The wedge 30 is bifurcated or fork-shaped, with its two legs or shanks having the same length and tapered toward their free ends, said legs being connected to one another via the intermediate arcuate portion 30a in registry with the upper end 7a of the rod 7. The distance between the two legs of the wedge member 30 is approximately equal to the diameter of the clamping bar 20.

Fastened onto the threaded portion 20a of the one end of the clamping lever or bar 20 is a securing nut 33, as best seen in FIGURE 6, which nut bears against the clamping jaw 26. The nut 33 is screwed onto the clamping bar 20 a distance great enough to keep the laminae 10 frictionally pressed together. Thus, the pairs of lever arms 15, 16 can be frictionally clamped in any desired position. Moving the wedge member 30 downwards, achieved by depressing the foot actuated lever 8, tends to increase the distance between the clamping jaws 25, 26. This is due to the fact that the roller 32 moves along the tapered conical surfaces of the wedge 30 towards the clamping jaw 25 which pushes the spring-like clamping jaw 26 away from the clamping jaw 25. The clamping jaw 26 is provided with its resilient construction to ensure that the slackening and fastening take effect without jolting and in a smooth manner to ensure that a certain squeezing pressure exists even in the slackened condition.

To prevent the drawing board from moving downwards by itself when the clamping jaws 25, 26 are slackened to reduce frictional contact between the adjacently arranged laminae 10, a pair of torsion springs 21, 31 are arranged between the leg 2 and its associated lever arm 15, and

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between the leg 2a and its associated lever arm 16, in such a manner that the torsion springs 21, 31 are arranged circumjacent the clamping jaws 25, 26 on a common axis. As best seen in FIGURES 3 and 5, the torsion springs 21, 31 are each held at one end in one of the bolts 22, 27 respectively, and at the other end in one of the arc-shaped plate members 23, 28 respectively. The plate members 23, 28 are provided with several detents to which the spring ends may be selectively attached to adjustably pretension the respective springs 21, 31. The bolts 22, 27 and the plate members 23, 28 are secured to the outermost laminae 10 of the legs 2, 2a and the pairs of lever arms 15 and 16, respectively. When the clamping jaws 25, 26 are in slackened condition, the force of the torsion springs 21, 31 counterbalances the weight of the drawing board 19 and the pairs of lever arms 15, 16, so that the drawing board 19, for example, can be adjusted with very little effort into any required position. The spring force of the torsion springs is adjusted according to the weight acting on the pairs of lever arms 15, 16, so as to ensure that, when the clamping members are in free or slackened condition, even extra-heavy drawing boards are balanced or gradually move upwards or forwards. Thus, in order to change the position of the board 19, it is sufficient to operate foot lever 8 to free the clamping members 25, 26 and then to exert a light horizontal thrust against the board and a vertical upward pull.

As previously described, the torsion spring 31 is attached to the bolt 27 provided for the leg 2a and also engages the plate member 28 provided for the lever arm 16, while the torsion spring 21 is attached to the bolt 22 of the lever arm 15 and engages the plate member 23 of the leg 2. As a result, the torsion spring 21 forces the pair of spaced lever arms 15 upwards and the torsion spring 31 forces the pair of spaced lever arms 16 rearwards. Thus, the two torsion springs 21, 31 obviate the need for a counterweight for balancing purposes. Accordingly, the drawing stand described herein is lighter in weight, less expensive to manufacture and requires less space than those known to the art and provided with a counterweight. Moreover, the space between the legs 2, 2a can be used to accommodate a work kit or the like, thus generally resulting in a saving of space. In view of the possibility of positioning the drawing stand at a relatively low elevation and the fact that the board 19 can be adjusted to assume a horizontal position, the drawing stand herein described can also be used as a table or desk. For purposes of further illustration, three different possible positions of the board are shown in phantom lines in FIGURE 2. The torsion springs 21, 31 are adapted to absorb the vertical and horizontal force components of the weight of the table top 19. It has been found desirable, by way of example, to construct the shorter lever arm 16 with respect to the longer lever arm 15 in the ratio of preferably 1:1.6 to 1:23; and also to eccentrically center the pivot shaft 20 with respect to the center of the table top 19.

It would naturally also be possible to employ only a single parallelogram arrangement. Moreover, the laminae could be provided with a suitable coating for increasing the frictional contact thereof. In view of the provision of the large frictional surfaces provided by the bank of laminae or the lamina packets, it is possible to exert very high pressures on the board without dislodging it from its set position.

Having thus described the present invention what is desired to be secured by United States Letters Patent is:

1. In a drawing stand or the like; a base stand, a table top adapted for adjustment with respect to elevation and inclination, means for adjustably mounting said table top on said base stand, said mounting means including means defining at least one parallelogram having a lowermost corner remote from said table top pivotably supported

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about an axis of rotation by said base stand, said base stand being provided with a plurality of spaced laminae, said lowermost corner of said parallelogram being defined by pivotably arranged lever means each having a plurality of spaced laminae cooperable with said laminae of said base stand to form an interengageable group of laminae defining a clamping mechanism for frictionally retaining said table top in a preset position, means cooperable with said respective laminae for urging the latter into frictional contact with one another, said cooperable means including clamping jaw means adjacent said group of laminae, a bifurcated wedge member for compressing and freeing said clamping jaw means, and push rod means for actuating said bifurcated wedge member, and at least one torsion spring coaxially arranged with respect to the pivotably supported lowermost corner of said parallelogram for counterbalancing the weight of said table top.

2. In a drawing stand or the like; a base stand, a table top adapted for adjustment with respect to elevation and inclination means for adjustably mounting said table top on said base stand, said mounting means including means defining a pair of spaced parallelograms each having a lowermost corner remote from said table top pivotably supported about a common axes of rotation by said base stand, a plurality of spaced laminae supported by said base stand, said lowermost corner of each parallelogram being defined by pivotably arranged lever means each having a plurality of spaced laminae arranged to intergrip with said laminae of said base stand to define a respective clamping mechanism for frictionally retaining said table top in a preset position, clamp jaw means cooperable with said respective clamping mechanism urging said intergripping laminae into frictional contact with one another, wedge means adjacent one clamp jaw means, and rod means for actuating said wedge means for compressing and releasing said intergripping laminae, and at least one torsion spring coaxially arranged with respect to the pivotably supported lowermost corners of said parallelograms for counterbalancing the weight of said table top.

3. In a drawing stand or the like; a base stand, a table top adapted for adjustment with respect to elevation and inclination, means for adjustably mounting said table top on said base stand, said mounting means including means defining a pair of spaced parallelograms each having a lowermost corner remote from said table top pivotably supported about a common axis of rotation by said base stand, a plurality of spaced laminae supported by said base stand adjacent each parallelogram, said lowermost corner of each parallelogram being defined by pivotably arranged lever means each having a plurality of spaced laminae arranged to intergrip with said laminae of said base stand to define a separate clamping mechanism for each parallelogram capable of frictionally retaining said table top in a preset position, clamp jaw means for each separate clamping mechanism urging said intergripping laminae into frictional contact

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with one another, an axially movable transverse bar supporting said clamp jaw means, a wedge member adjacent one of said clamp jaw means, a rod member cooperable with said wedge member for compressing and releasing said intergripping laminae, and at least one torsion spring coaxially arranged with respect to the pivotably supported lowermost corners of said parallelograms for counterbalancing the weight of said table top.

4. In a drawing stand or the like according to claim 3; said wedge member being a bifurcated member at least partially surrounding said transverse bar.

5. In a drawing stand or the like according to claim 3; wherein said movable transverse bar piercingly extends through each of said laminae.

6. In a drawing stand or the like according to claim 3; wherein one of said clamp jaw means is a resilient plate carried by said movable transverse bar.

7. In a drawing stand or the like; a base stand, a table top adapted for adjustment with respect to elevation and inclination, means for adjustably mounting said table top on said base stand, said mounting means including means defining a pair of spaced parallelograms each having a lowermost corner remote from said table top pivotably supported about a common axis of rotation by said base stand, a plurality of spaced laminae supported by said base stand adjacent each parallelogram, said lowermost corner of each parallelogram being defined by pivotably arranged lever means each having a plurality of spaced laminae arranged to intergrip with said laminae of said base stand to define a separate clamping mechanism for each parallelogram capable of frictionally retaining said table top in a preset position, clamp jaw means for each separate clamping mechanism urging said intergripping laminae into frictional contact with one another, an axially movable transverse bar supporting said clamp jaw means, a wedge member adjacent one of said clamp jaw means, a rod member cooperable with said wedge member for compressing and releasing said intergripping laminae, a separate torsion spring coaxially arranged with respect to the pivotably supported lowermost corners of said parallelograms for counterbalancing the weight of said table top.

8. In a drawing stand or the like according to claim 7; where said clamp jaw means and separate torsion springs are coaxially arranged, one of said torsion springs taking up the vertical weight component of said table top and the other torsion spring the horizontal weight component.

9. In a drawing stand or the like according to claim 8, wherein means cooperating with said torsion springs are provided to pretension the latter.

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