

July 30, 1946.

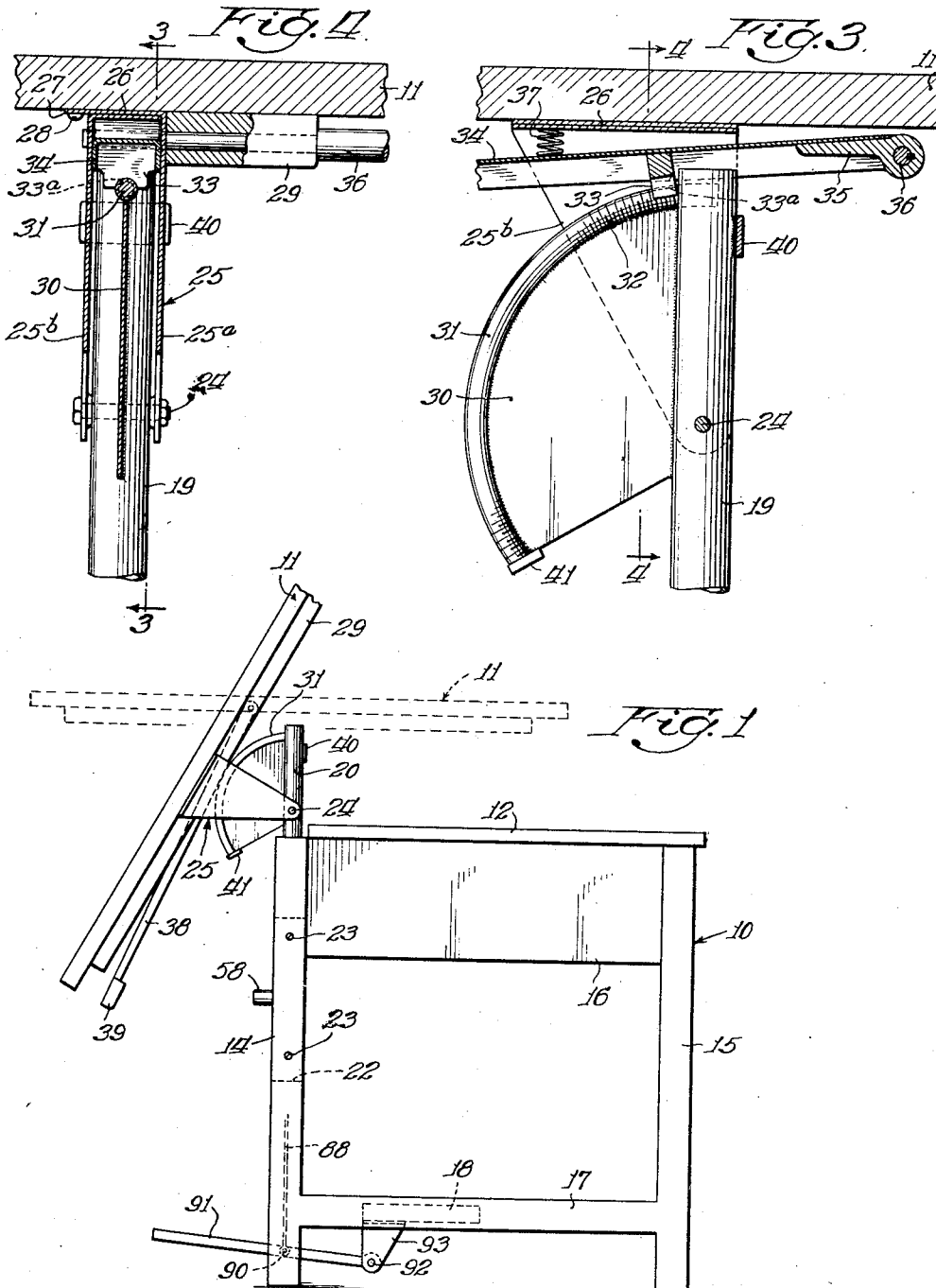
H. L. DE LISLE

2,404,949

ADJUSTABLE DRAFTING STAND

Filed Sept. 17, 1942

3 Sheets-Sheet 1



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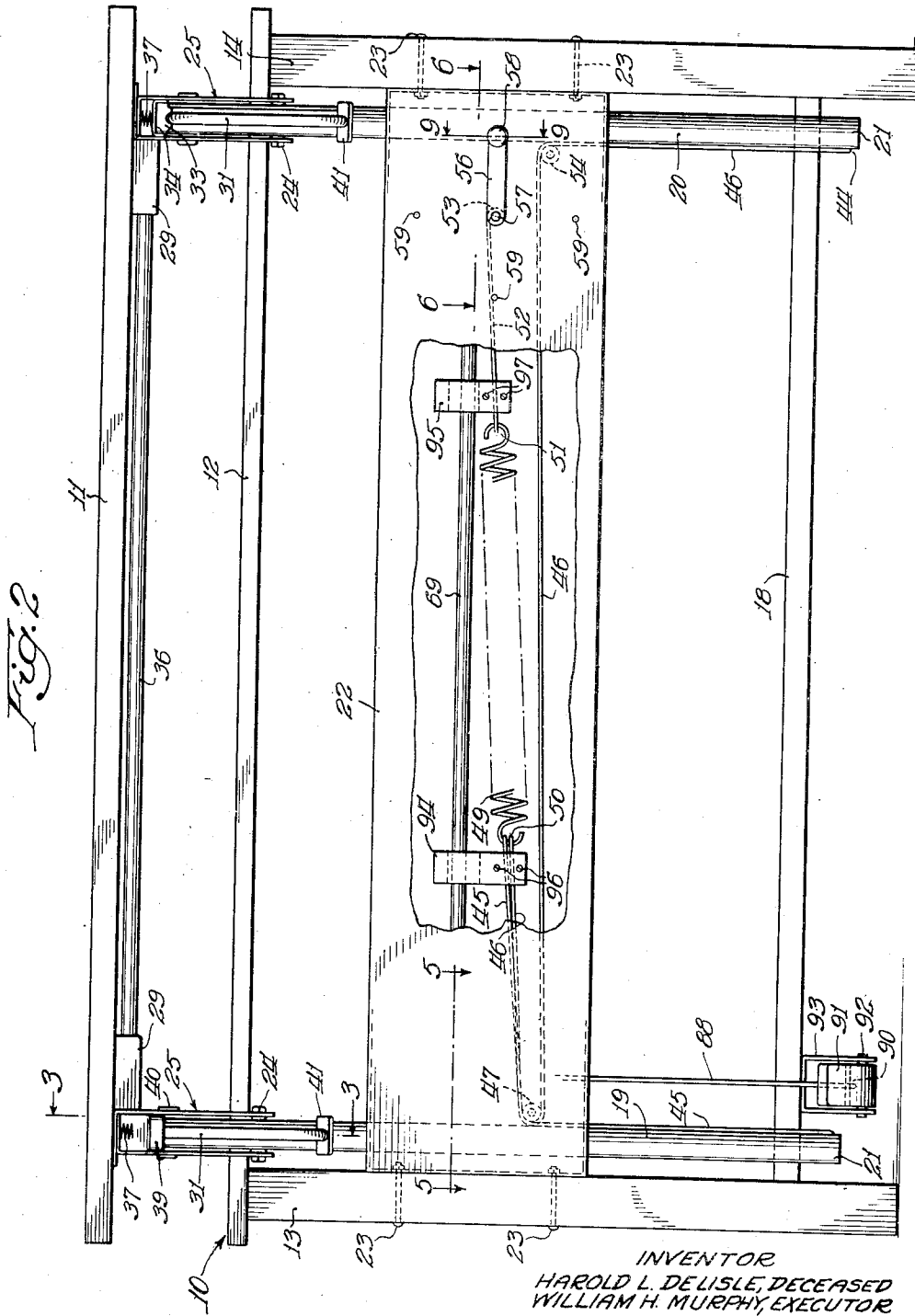
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Fig. 5

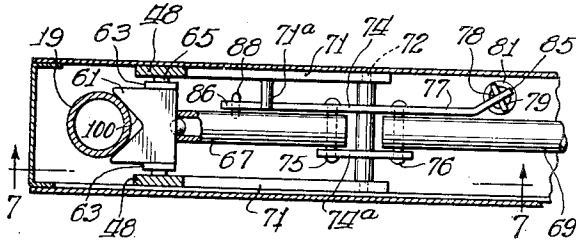


Fig. 6

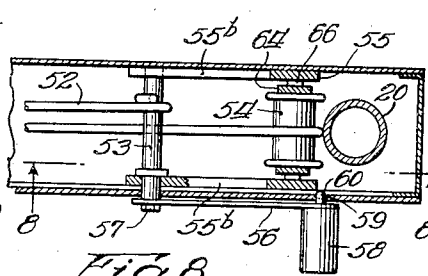


Fig. 7

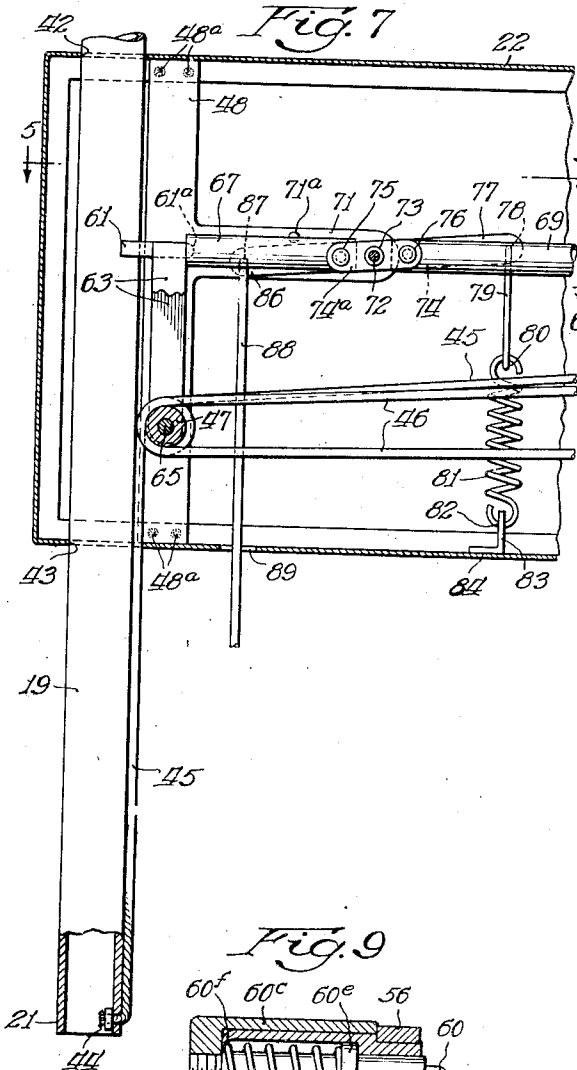


Fig. 8

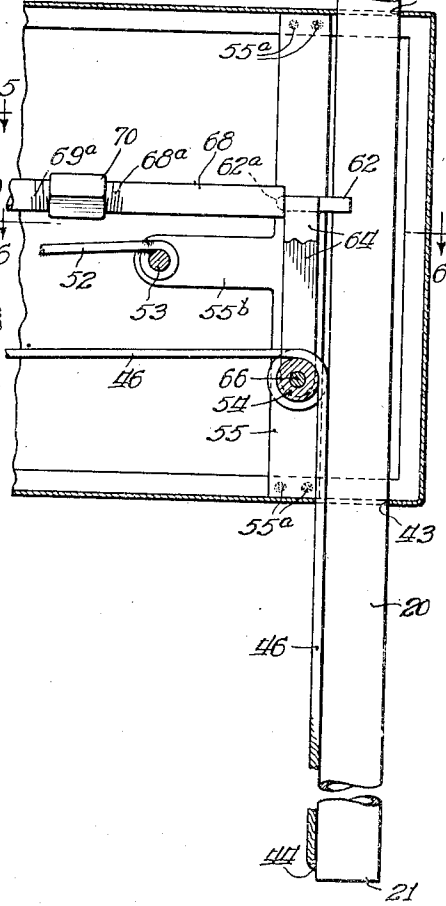
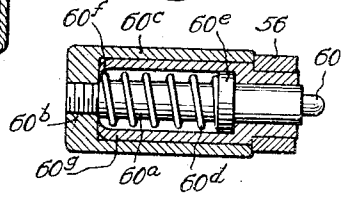


Fig. 9



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UNITED STATES PATENT OFFICE

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ADJUSTABLE DRAFTING STAND

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Application September 17, 1942, Serial No. 458,634

10 Claims. (Cl. 45—131)

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This invention relates to adjustable drafting stands of the class in which the drawing board is adjustable both vertically and angularly and, more particularly, of the type wherein the drawing board is maintained in its adjusted inclined position by friction, and, in its adjusted vertical position, is balanced by a spring adapted to be adjusted to exert a controllable tension.

Among other objects, the present invention aims to provide an improved and simplified construction of this type including a novel gripping mechanism for the inclination of the drawing board which may be released by a manual movement by the draftsman, and, similarly, novel tension means for the vertical adjustment of the board which may be operated by a movement of the foot through a pedal device.

These and other objects and advantages will be apparent from the following description, taken together with the accompanying drawings, in which—

Figure 1 is an end elevational view of a drafting stand embodying the present invention, showing in full lines an inclined selected position of the drawing board, and, in broken lines, a horizontal position thereof;

Figure 2 is an enlarged front elevational view of the structure of Fig. 1, parts being cut away for clearness of description;

Figure 3 is an enlarged partial cross-section taken on the line 3—3 of Fig. 2, and also being a similar section on the line 3—3 of Fig. 4;

Figure 4 is a fragmentary view on the scale of Fig. 3 of the left-hand side of Fig. 2 but with parts in cross-section taken on the line 4—4 of Fig. 3;

Figure 5 is an enlarged partial plan view taken on the line 5—5 of Fig. 2;

Figure 6 is a similar view taken on the line 6—6 of Fig. 2;

Figure 7 is a partial vertical section on the scale of Fig. 5, taken on the line 7—7 of Fig. 5;

Figure 8 is a similar view taken on the line 8—8 of Fig. 6; and

Figure 9 is a detail section taken on the line 9—9 of Fig. 2 somewhat enlarged.

Referring in detail to the illustrative construction shown in the drawings, the numeral 10 indicates in general a base for the drawing board indicated generally by the numeral 11. The base 10 may be in the form of a table or desk having a working top 12, front legs 13 and 14 and rear legs 15. The table may be reinforced along its top ends by panels 16 and along its lower ends by cross-pieces 17, the latter being connected by a longitudinal runner 18, thus providing a suitable

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supporting structure for the board. The top 12 of the table may be used as one working surface, accessible from one side of the table 10, which is here referred to as the rear side, namely the side opposite that at which the drawing board 11 is pivoted as next described. The drawing board 11 provides another working surface in the usual way.

In accordance with the present invention, the table 10 at its front side carries for simultaneous vertical adjustment, as later more particularly explained, a pair of hollow posts 19 and 20 having their free lower ends 21 slidingly passed through a casing 22 carried at the front of the desk 10 by and between the legs 13 and 14 thereof. This casing is here shown of about the width of the legs and extending vertically thereof about one-third of the height of the legs, but preferably a little nearer their tops than their feet. Bolts 23 may so secure the casing to the legs 13 and 14. It will be noted that the table top 12 terminates at the front of the table adjacent the posts 19 and 20 short of the legs 13 and 14 so as to accommodate the posts in the plane of the legs.

Adjacent their tops, there is shown pivoted to each of the vertically movable posts 19 and 20, as at 24, a yoke-like or inverted U-shaped bracket 25, which as best shown in Fig. 4, may be formed of two angular sector-shape plates 25a and 25b having their flanges welded together as at 26, one of the latter being extended as at 27 to be secured as by screws 28 to the under face of the drawing board 11, the board and brackets being reinforced adjacent thereto by the cross-cleats 29 also on the under face of the board.

With the drawing board so arranged for angular movement on the pivots 24, frictional or gripping means are provided for holding the board at a selected angular adjustment whereby the board 40 may be disposed either vertically or horizontally or at any intermediate angle therebetween. For this purpose, there is shown secured to each of the posts 19 and 20, between the plates 25a and 25b of each of the yoke-like brackets 25 respectively, a segment plate 30 along the arcuate periphery of which is suitably secured an arch rail 31 having corrugations thereon, as by the screw threads 32. A frictional mating member such as the half-nut 33 rides on each of the arch rails 31, the half-nut 33 being here shown secured between the sides of an inverted channel bar 34. The threads 33a in the half-nut mesh with the screw threads 32 on the arch rails, the bracket 25 also straddling the channel bar 34.

Each of the channel bars 34 is secured to a

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finger 35 which is keyed to a rock shaft 36 journaled at each end in the cleats 29, the ends of the rock shaft 36 which pass through the cleats and through the fingers 35 being conveniently reduced, as best shown in Fig. 4, to prevent longitudinal movement of the rock shaft. Between each of the inverted channel bars 34 and the flanges 26 of the brackets 25 is inserted a compression coil spring 37 which normally biases the channel bars 34 into position to cause the gripping members 33 to frictionally engage the arch rails 31, and, in this instance, to intermesh the threads 33a on the half-nut 33 with the threads 32. One of the inverted channel members 34, in this instance the one at the left-hand end of the drawing board is conveniently extended outwardly as at 38 to form a hand lever by which the common rock shaft 36 may be partially rotated against the action of the springs 37 to release the gripping members 33 from the arch rails 31 and thus permit angular adjustment of the drawing board, as suggested in Fig. 1.

The end of the lever 38 may terminate in a wooden handle 39 for convenience in grasping this lever and moving it toward the board to effect the release just described. Upon letting go of the lever 38, the springs 37 again urge the gripping members 33 into engagement with the arch rails 31 to retain the board in its selected angular position until its position is again desired to be changed. Stop members 40 carried at the top of the posts 19 and 20 limit backward rotative movement of the pivot brackets 25 on the posts to inhibit rotation of the drawing board in this direction beyond the horizontal position as shown in broken lines in Fig. 1, and other stops 41 at the lower ends of the arch rails 31 may limit the rotation of the drawing board in the opposite direction, by also contacting with the pivot brackets 25.

Turning now to the means for effecting the vertical adjustment of the drawing board, and further in accordance with the present invention, the casing 22 receives the posts 19 and 20 therethrough by means of apertures 42 and 43 in the upper and lower walls respectively of the casing, these apertures affording a sliding fit for the posts therein. Affixed to each of the free ends 21 of the posts, as at 44, are flexible members such as, in this instance, the cable 45 for the post 19 and the cable 46 for the post 20. These cables run upwardly parallel with the posts and into the casing 22 where they are supported as next described. It will be noted that the openings 43 in the lower wall of the casing are enlarged sufficiently to pass the cables therethrough with the posts, the cables being here shown upon the outside of the posts in contact therewith.

The cable 45 for the post 19 in this instance passes over an idler pulley 47 journaled within the casing on a pair of uprights 48 riveted as at 48a to the inner faces of the casing, and thence to one end of a relatively heavy expansion coil spring 49, to which the cable 45 is hooked as at 50. The other end of this expansion coil spring is hooked as at 51 to a cord 52, the other end of which is wound on a spindle 53 journaled within the casing 22 adjacent its end opposite the post 19. The cable 46 for the post 20 passes upwardly into the casing 22 similarly to the cable 45 and over an idler pulley 54 journaled within the casing on uprights 55 riveted as at 55a to the inner faces of the casing. The cable 46 thence travels longitudinally of the casing 22 to pass over the same pulley 47 upon which the cable 45 is en-

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trained, and thence the cable 46 travels from the pulley 47 with the cable 45, to the coil spring 49 where it is also connected, as at 50, to the coil spring. The spindle 53 has its bearing in the casing walls advantageously reinforced by extensions 55b of the uprights 55.

Tension on the spring 49 may be varied by means of a crank 56 on the exterior of the casing which is keyed to the spindle 53, as at 57, and has a handle 58. By rotating the crank 56 in a clockwise direction, looking at Fig. 2, the tension of the spring 49 may be increased and by turning the crank counter-clockwise, the tension may be decreased. The face of the casing may have radially arranged holes 59 therein into which a nib 60 at the inner end of the handle 58 may be sprung to hold the crank in selected adjusted positions against the pull of the spring 49. The handle 58 may be constructed as shown in Fig. 9 in which the nib 60 is shown integral with a spring plunger 60a threadedly connected as at 60b with the exterior shell 60c of the handle. A coil spring 60d surrounds the plunger 60a and presses at one end against the flange 60e of the plunger 60a and at its other end against the crimped end 60f of a spring barrel 60g. By pulling outwardly on the exterior shell 60c of the handle, the nib is retracted, the spring being further compressed, so as to be again urged toward the face of the casing upon release of the handle.

Thus the entire weight of the posts 19 and 20 and with them the drawing board 11 and its angular adjustment mechanism may be counterbalanced by the spring 49. In practice, almost the entire weight is counterbalanced so that vertical adjustment of the drawing board may be effected by relatively slight manual effort on the part of the draftsman, to raise or lower the drawing board as desired. A brake mechanism, as next described, is provided to maintain the board in such selected vertical adjustment.

Following the present invention, the brake mechanism just referred to comprises, as here shown, a pair of jaws 61 and 62 which, by their somewhat wedge-shape mouths 100, partially receiving the posts 19 and 20 respectively, are arranged to jam the posts between themselves and the opposite margins of the casing apertures 42 and 43 and thus to frictionally clamp the posts against vertical movement therein. The jaws 61 and 62 are shown carried integrally at the upper ends of bifurcated arms 63 and 64 respectively. The arm 63 is conveniently pivoted on the pivot 65 of the idler pulley 47 and the arm 64 is pivoted similarly on the pivot 66 of the idler pulley 54. Loosely connected to the jaw 61, as by a somewhat ball and socket connection, is a short cylindrical hollow bar 67, a nib 61a on the jaw projecting into the interior of the bar, and connected to the jaw 62 is a similar hollow bar 68 which has a relatively long extensible section 69. A nib 62a on the jaw 62 projects loosely into the interior of the bar 68. These bars may be conveniently in the form of pipes or tubing. The bar sections 63 and 69 are left and right-hand threaded as at 68a and 69a respectively where they are connected by a threaded coupling 70 by which the combined length of the bar sections 68 and 69 may be shortened or lengthened.

Adjacent the left-hand end of the casing 22, in this instance, the uprights 48 are extended as at 71 to provide a bearing as at 72 for a pintle 73 extending across the casing. Upon the pintle 73 is pivoted centrally a pair of parallel brake links 74 and 74a. The links 74 and 74a are ex-

tended in opposite directions from their pivot 73. The otherwise free ends of the bars 67 and 69 are pivoted as at 75 and 76 respectively to the adjacent ends of the brake links 74 and 74a. The link 74 is further extended in both directions of the pivot 73, in one direction as at 77 to have hooked thereto as at 78 a wire 79 which has its other end hooked as at 80 to an expansion coil spring anchored as at 82 to a clip 83, welded as at 84 to the lower wall of the casing. The extremity of the extension 77 of the link 74 may be offset outwardly as at 85 to be clear of the bar 69. The other end 86 of the link 74 has articulated therewith as at 87 a wire rod 88 which extends downwardly through a slot 89 in the lower wall of the casing to be articulated as at 90 with a foot lever or pedal 91 pivoted as at 92 on an inverted U-shape bracket 93 suitably secured to the under face of the desk runner 16.

Since in the normal position of the bars 67 and 69, a line connecting the pivots 75 and 76 of the bars 67 and 69 on the links 74—74a is substantially aligned with the axes of these bars, the bars are at substantially their maximum distance apart and the jaws 61 and 62 are pressed outwardly to clamp the posts 19 and 20 respectively against vertical movement. When, now, the pedal 91 is depressed, the rod 88 is reciprocated downwardly and the brake links 74—74a are rotated counter-clockwise on their pivot 72 against the force of the expansion spring 81. Rotation of the brake links draws the ends of the bars 67 and 69 toward each other or at least toward a vertical line passing through the pivot 72, thus reducing the overall length of the bars 67—69—68 and relaxing the pressure of the jaws 61 and 62 on the posts 19 and 20 respectively. This movement need be only very slight and the articulated connections provided by the nibs 61a and 62a (somewhat in the nature of universal joints) with the bars accommodate this movement of the brake links. There may be at the same time a slight inward movement toward each other of the arms 63 and 64 on their pivots 65 and 66 during the contractural movement of the bars just described. Thus, the posts 19 and 20 are released for vertical movement and are rendered subject to the pull of the spring 49, and counter-balanced thereby, so that the drawing board may be either depressed or elevated by a light pressure of the hand. Thereupon the pedal 91 may be released and the drawing board again secured at its desired elevation. The extension 71 carries a brake stop lug 71a which limits clockwise rotation of the links 74—74a under the influence of the expansion spring 81 to a point where a line connecting the pivots 75 and 76 is substantially coincident with the axis of the bars 67—69. The stop lug 71a acts by engagement with the extension 86 of the link 74.

Intermediate the casing 22, the bar 69 may carry a pair of wooden hangers 94 and 95 somewhat loosely thereon. The hanger 94 at its lower end has a pair of vertically spaced apart screws 96 between which and between the open sides of the hanger pass the cables 45 and 46, thus providing a guide for these cables. Similarly, the hanger 95 has a pair of vertically spaced apart screws 97 between which and between the open sides of this hanger slidably passes the cord 52 to guide this cord in its movement. The hangers 94 and 95 also assist in maintaining the spring 49 in transverse position in the casing but are adapted to slide on the bar 69 to accommodate longitudinal expansion or contraction of the

spring, the spring 49 being thus what is commonly known as floating.

It is to be understood that the invention is not intended to be limited to details of construction here shown for illustrative purposes. Other modifications will suggest themselves to those skilled in the art and having the benefit of the present disclosure. Furthermore, it is not intended that it be understood that all features of the present disclosure must be used conjointly, since it will be apparent to workers in the art that various combinations or sub-combinations may at times be advantageously employed.

The invention having been described, what is claimed is:

1. In a drafting stand including a pair of vertically movable posts, the combination including, a casing having spaced apertures, said posts passing through the apertures and slidable with respect to the casing, a pair of brake members hinged in the casing and adapted to frictionally engage the posts to clamp them against movement, a pair of aligned movable bars supported within the casing by said brake members respectively, a link intermedially pivoted in the casing and articulated at each end with said bars respectively, a spring anchored in said casing, means connecting the spring and link, said spring means urging the link in a direction to press the bars apart whereby to urge the brake members into frictional engagement with said posts, and a manually operable lever secured to said link in said casing and adapted to rotate the link in the opposite direction against the force of said spring to release the brake members.

2. In a drafting stand of the type comprising a base and a pair of vertically reciprocable spaced apart upright members adjustably supporting a drawing board on the base, the combination including, a casing having spaced apertures in which said upright members are slidably arranged, a pair of brake members hinged in the casing and adapted to frictionally engage the upright members and press them against the sides of the casing apertures to clamp them against movement, a pair of aligned movable bars engaging said brake members respectively, a link intermedially pivoted in the casing and articulated at each end with said bars respectively, spring means connected to the link, said spring means urging the link in a rotative direction to urge the bars apart whereby to urge the brake members into clamping engagement with said upright members, and a manually operable lever secured to said link in said casing and adapted to rotate the link in the opposite direction against the force of said spring to release the brake members.

3. In a drafting stand of the type including a base and a pair of upright spaced apart members vertically reciprocable relative to the base, the combination including, a casing having spaced apertures in which said members are slidably arranged, friction brake means in and cooperating with said casing to hold the members in vertically adjusted positions relative to said casing, said brake means including a pair of movable friction pieces located between the members and engageable with the members, and means for simultaneously and selectively drawing the friction pieces together to effect disengagement thereof from the members and moving them apart to effect engagement thereof with the members.

4. The structure of claim 2 wherein the combined length of the bars is adjustable.

5. The structure of claim 2 wherein the brake members are loosely connected to the bars respectively by a ball and socket connection.

6. In a drafting stand of the type including a base, a pair of upright spaced apart members vertically reciprocable on the base, and a drawing board supported by said members, the combination including, a casing mounted on the base and having a pair of spaced apart apertures movably receiving the upright members, and friction brake mechanism located within said casing for holding said upright members in adjusted vertical positions, said brake mechanism including a pair of movable friction pieces pivotally mounted in said casing between the members and engageable with the members, and mechanism including means operable from the exterior of the casing for selectively drawing the friction pieces together to effect disengagement thereof from the upright members and moving them apart to effect engagement thereof with the members.

7. In a drafting stand, a base structure, a pair of board supporting members slidably supported in horizontally spaced relationship for vertically reciprocable movement on and relative to said base structure, a drawing board mounted on said board supporting members at the upper ends thereof, means including a spring connected to said base structure and both of said board supporting members for urging said board supporting members and said drawing board upwardly, a pair of brake members each movably secured to said base structure adjacent one of said board supporting members for movement toward each other and away from the respective board supporting members and for movement away from each other toward the respective board supporting members, said brake members being frictionally engageable with said board supporting members when moved away from each other and disengageable from said board supporting members when moved toward each other, and toggle means mounted on the base structure and interconnecting said brake members for moving the latter toward each other to disengage the same from said board supporting members and for moving said brake members away from each other into frictional engagement with said board supporting members.

8. In a drafting stand as set forth in claim 7 a casing carried by said base structure, having spaced apertures in which said board supporting members are slidably arranged and housing said

members, said spring and the toggle means for the brake members, said apertures having sides cooperating with said brake members when the latter are moved away from each other into frictional engagement with said board supporting members for holding the board supporting members and the drawing board in vertically adjusted position.

9. In a drafting stand, a base, a casing mounted on said base and having horizontally spaced apertures therein, a pair of board supporting members slidably arranged in spaced upright positions for vertically reciprocable movement in said apertures, a drawing board mounted on said board supporting members at the upper ends thereof, means connected to said board supporting members and said casing for urging said board supporting members and said drawing board upwardly, a pair of brake members each movably mounted in said casing adjacent one of said board supporting members for movement from and to engagement therewith, said brake members being frictionally engageable with said board supporting members when the brake members are spread apart and disengageable therefrom when moved toward each other, toggle means including a spring supported in said casing between said brake members and resiliently urging them apart into frictional engagement with the respective board supporting members for holding said board supporting members and drawing board in vertically adjusted positions relative to said casing, and manually operable means for operating the last said means to move said brake members toward each other out of holding engagement with said board supporting members.

10. A friction brake mechanism for holding in selected vertical adjustment a pair of spaced apart members supporting a drafting board for vertical movement on a base, said brake mechanism including a pair of movable friction pieces pivotally mounted on the base and engageable with the members when said friction pieces are moved apart and disengageable therefrom when drawn together, and means including a single cable connection and a single cam actuated through said connection for simultaneously drawing the friction pieces together or moving them apart.

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