July 9, 1929. F. T. EWALD 1,720,121

DRAWING HOLDER AND TIGHTENER FOR DRAWING BOARDS

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Fig. 1.

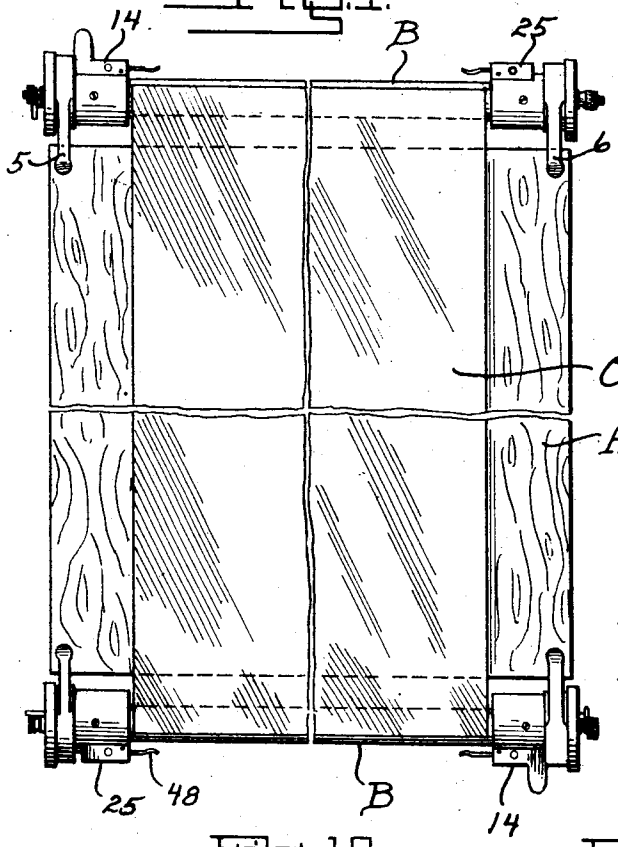

Fig. 2.

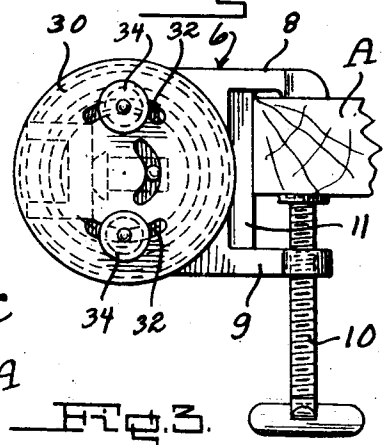

Fig. 3.

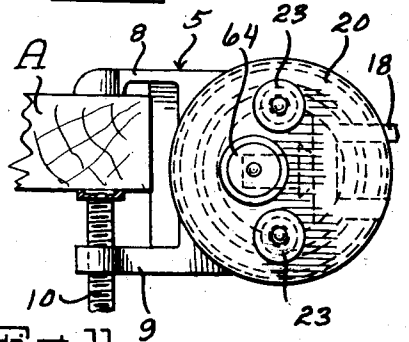

Fig. 10.

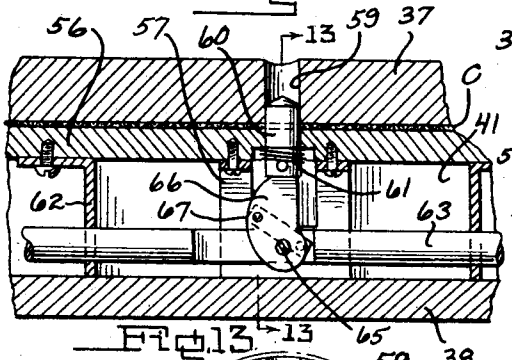

Fig. 11.

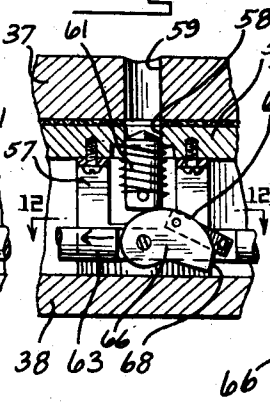

Fig. 12.

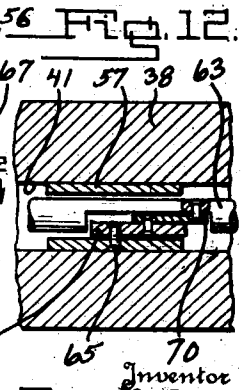

Fig. 13.

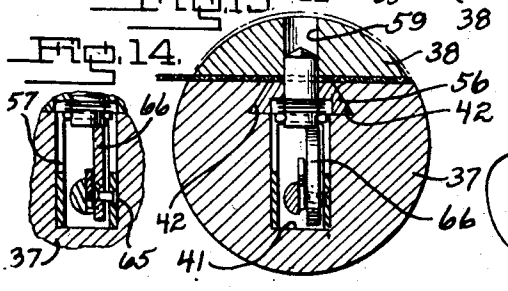

Fig. 14.

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DRAWING HOLDER AND TIGHTENER FOR DRAWING BOARDS

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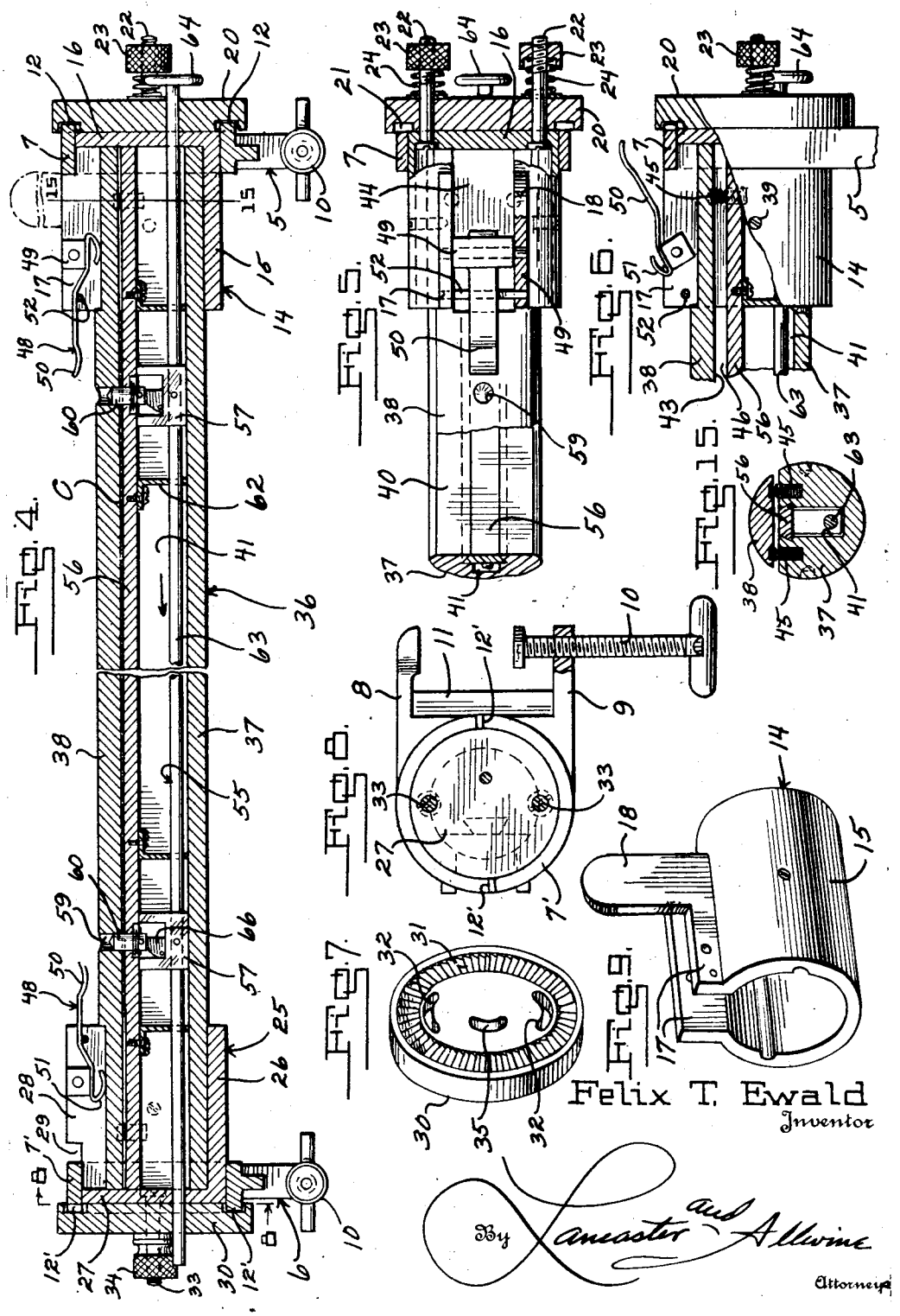

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 15.

Fig. 8.

Fig. 7.

Fig. 9.

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UNITED STATES PATENT OFFICE.

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DRAWING HOLDER AND TIGHTENER FOR DRAWING BOARDS.

Application filed August 10, 1927. Serial No. 212,086.

The present invention relates to means for retaining sheet material in a taut and smooth position upon a flat surface, and the primary object of the invention resides in the provision of a combined holder and tightener especially well adapted for use in connection with drawing boards or tables for holding drawing or tracing sheets of various dimensions in a flat and firm condition upon the working surface of the board or table.

A further object of the invention is to provide a device of this character adapted for detachable connection with the opposite edges of a drawing board or table and embodying an arrangement whereby two opposite edges of tracing cloth or paper may be firmly gripped so that the same is not apt to be torn when being drawn tightly over the upper surface of the drawing board or table.

A further object of the invention is to provide an improved device as set forth embodying a pair of paper receiving and retaining shafts adapted to be rotatably mounted longitudinally of two opposite edges of the drawing board, and each of which shafts embody adjusting means whereby one end of the shaft may have slight rotary movement with respect to the opposite end of the shaft for allowing one edge of the paper to be tightened further than the opposite edge of the paper when such becomes necessary for disposing the paper in a perfectly flat and smooth position upon the working face of the board.

A further object of the invention is to provide an improved drawing sheet holder and tightener embodying a clamping shaft for rotatable mounting at one edge of the drawing board, with retaining means at opposite ends of the shaft so constructed as to allow for the shaft being released and operated wholly from one end thereof, thus enabling a lone operation to apply and remove the drawing paper from the shaft as when the shaft is of considerable length so that the operator cannot reach each end of the shaft for releasing the same when removing the drawing papers therefrom.

Other objects and advantages of the invention will be apparent during the course of the following detailed description, taken in connection with the accompanying drawings forming a part of this specification and in which drawings:

Figure 1 is a view illustrating the manner in which a pair of the holders and tighteners may be applied to opposite edges of a drawing board or table for retaining a drawing sheet or sheet of tracing cloth in a taut and smooth position upon the board.

Figure 2 is an enlarged end view of the improved device and showing the manner in which the same may be applied to one edge of a drawing board or table.

Figure 3 is an end plan view of the opposite end of the device from that as shown in Figure 2.

Figure 4 is an enlarged longitudinal section thru the device and showing the parts thereof in position for firmly gripping a sheet of drawing paper or tracing cloth.

Figure 5 is a fragmentary view of one end of the device and showing sections broken away for illustrating certain details of construction.

Figure 6 is a view part in elevation and part in longitudinal section of that end of the device as illustrated in Figure 5 and showing the clamping means of the shaft having been released for allowing ready withdrawal or insertion of the drawing sheet between the shaft sections.

Figure 7 is a perspective view of the ratchet disc or wheel for relative rotary adjustment of one end of the shaft.

Figure 8 is a section on line 8—8 of Figure 4.

Figure 9 is a perspective view of the release cap for positioning at the operating end of the holder.

Figure 10 is an enlarged fragmentary longitudinal section illustrating the arrangement whereby the shaft sections are held against relative movement when the paper is in position between the shaft sections.

Figure 11 is a view substantially similar to that shown in Figure 10 but showing the pin having been retracted from its engagement with the minor or clamp section of the shaft.

Figure 12 is a fragmentary section on line 12—12 of Figure 11.

Figure 13 is a transverse section on line 13—13 of Figure 10 and showing the particular formation of the shaft for housing the cam actuating means.

Figure 14 is a fragmentary transverse section illustrating the pivotal mounting of one of the cams upon a supporting bracket adapted for removable positioning within the guide way of the major shaft section.

Figure 15 is a fragmentary transverse section thru the shaft on line 15—15 of Figure 4 and showing the manner in which the shaft sections are separated for providing an opening for receiving the sheet or sheets of drawing material.

Referring to the drawings in detail, and wherein similar reference characters designate corresponding parts thruout the several views, the letter A may designate a drawing board or table of any desired type, and B the improved holder and tightener, two of which have been shown applied to the board or table A for retaining a sheet of drawing material C in a taut and smooth position upon the flat surface of the member A.

The holder B embodies a pair of right and left attaching or mounting brackets 5 and 6 respectively, and which brackets serve as means for detachably connecting the holder in parallel relation to one edge of the board A. These attaching brackets 5 and 6 are formed with circular bearing rings or collars 7 and 7′ respectively from each of which extend a pair of spaced upper and lower clamping arms 8 and 9 respectively, and threaded thru the lower arm 9 is a suitable clamp screw 10 which serves for rigidly securing the brackets to one edge of the board A. Extending between the inner ends of the arms 8 and 9 is a guide rib 11 which is intended to engage the edge of the board A for spacing the axis of the rings 7 and 7′ in aligning relation and in proper spaced relation from the edge of the board. Formed respectively at the outer edge of each of the bearing rings 7 and 7′; and spaced at diametrically opposite points about the rings, is a pair of ratchet teeth 12 and 12′. The relative positioning of these ratchet teeth is clearly illustrated in Figure 8.

Rotatably mounted at its outer end in the annular bearing ring 7 of the bracket 5, is a release cap 14 embodying a tubular portion 15 being closed at its outer end by a disc-like end wall 16. The normal upper side of the cap 14 is slotted from its inner end to the end wall 16, and arranged at each side of the slot are upstanding parallel spaced apart flanges 17 which as will be observed terminate at their outer ends short of the end wall 16 of the cap. The tubular portion of the body 15 which projects past the outer end of the flanges 17 is adapted to be rotatably fitted in the annular bearing ring 7 of the bracket 5 with the outer ends of the flanges abutting with the plain inner edge of the ring as is clearly illustrated in Figures 4 and 6. Projecting upwardly from the outer end of one of the flanges 17 is a release arm 18, and the object in so providing this arm will be subsequently explained.

Mounted in surface contact with the outer face of the end wall 16 of the release cap 14 is an operating wheel or knob 20 which is preferably of disc-like formation and provided at the inner face of the disc is a series of circularly arranged ratchet teeth 21 which are intended to be engaged by the teeth 12 of the ring 7 in a manner for allowing ready rotation of the knob in one direction and preventing counter-rotation of the knob in an opposite direction. The disc-like knob 20 is secured for rotation with the cap 14 as by means of tension bolts 22 which extend thru the cap head 16 and the knob 20, and these bolts 22 extend for a considerable distance past the outer face of the knob and are threaded at their outer ends for receiving knurled nuts 23 which when rotated upon the bolts 22, have movement toward and away from the knob 20. Encircling each of the bolts 22 between the knob 20 and nuts 23, are expansion coil springs 24 which serve for yieldably retaining the cap 14 and knob 20 in engagement with one another and allow for the knob to have longitudinal movement outwardly along the bolts 22 away from the bearing ring 7 whereby the annular series of teeth 21 may be moved out of engagement with the pair of teeth 12 formed on the outer edges of the bearing ring. Thus it will be seen that the knob 20 is held for rotation with the cap 14 but has relative longitudinal movement therewith. By observing Figures 4 and 6 it will be seen that when the knob 20 is pulled outwardly for releasing the same from its engagement with the teeth 12, that the cap 14 is held against longitudinal movement by reason of the flanges 17 engaging at their outer ends, the inner edge of the annular bearing ring 7.

Rotatably mounted at its outer end portion in the bearing ring 7′ of the bracket 6, is a bearing cap 25 embodying a tubular portion 26 being closed at its outer end by a disc-like end wall 27. The tubular portion 26 is slotted longitudinally and at each side of the slot are upstanding flanges 28 which extend in parallel spaced apart relation to one another in a like manner as to the flanges 17 of the release cap 14. The bearing cap 25 is of substantially like construction as that of the release cap 14 for the exception of the operation arm 18, and also that the flanges 28 are slightly shorter so that their outer ends terminate in spaced relation from the inner edge of the bearing ring 7′ of the bracket 6 as at 29 in Figure 4, and which termination of the flanges in spaced relation from the ring 7′ has been provided for permitting limited longitudinal outward movement of the cap through the bearing ring. It may here be stated that the internal diameter of the sleeve portion 26 of the bearing cap 25 is preferably of equal dimension as that of the internal diameter of the tubular portion 15 of the release cap 14.

Mounted at the outer face of the end wall 27 of the cap 25, is an adjusting knob 30 which

is preferably of disc-like formation and, provided at the inner face of the disc is a series of circularly arranged ratchet teeth 31 which co-act with the pair of teeth 12′ provided at the outer face of the bearing ring 7′ of the bracket 6. This wheel or knob 30 is intended to have slight relative movement circumferentially with respect to the cap 25, and is therefore provided with a pair of arcuate shaped openings 32 arranged concentric with the axis of the wheel, and thru which openings clamping bolts 33 carried by the cap 25 extend, and which bolts are threaded at their outer ends for receiving suitable thumb nuts 34 which may be turned into binding engagement with the outer face of the wheel for drawing the wheel into tight frictional engagement with the end wall 27 of the cap 25. These nuts 33 preferably have heads formed at their inner ends, and extend thru the cap head 27 at diametrically opposite points from the axis of the head as illustrated in Figure 8. Thus it will be seen that upon loosening the thumb nuts 34, that the knob 30 may have slight rotary movement relative to the bearing cap 25. The knob 30 is also provided with a circular shaped opening 35 which is also arranged concentric to the axis of the knob, and the purpose of this opening 35 in the knob 30 will be subsequently set forth.

Mounted at its opposite ends in the caps 14 and 25, is a receiving shaft 36 which is divided longitudinally for forming major and minor shaft sections 37 and 38 respectively and between which sections the drawing material is intended to be clamped so that the same may be drawn taut over the surface of the drawing board or table A. This receiving shaft 36 has its ends extending into the tubular portions of the caps 14 and 25 with the ends of the shaft abutting with the end walls 16 and 27 of the caps 14 and 25 respectively. This shaft 36 may be of any preferred length in accordance with the size sheet of drawing material to be used.

Referring first to the specific construction of the major shaft section 37, the same in cross section is in the form of a major segment of a cylinder having a diameter substantially equal to the internal diameter of the tubular body portions 15 and 26 so that the terminal portions of the shaft will have snug fitting engagement in the tubular body portions. This major shaft section 37 is held for rotation with the nuts 14 and 25 as by means of suitable set screws 39 threaded thru the tubular cap portions 15 and 26 into engagement with the terminal portions of the shaft section. Thus it will be seen that the shaft section 37 will be caused to revolve with the caps 14 and 25. This major shaft section by being in the form of a major segment of a cylinder in cross section, provides a clamping face 40 which extends thruout the length of the shaft section and faces upwardly between the cap flanges 17 and 28. Extending longitudinally of the section 37 from end to end thereof, and opening at one side upon the clamping face 40 at the longitudinal center thereof, is a channel or way 41 which is provided at its open side with dovetailed grooves 42 which extend from end to end of the shaft section.

As to the minor or clamp section 38 for co-acting with the major section 37, the same is preferably of segmental shape in cross section for providing a clamping face 43 which is disposed in confronting relation with the clamping face 40 when the shaft sections are in assembled relation, and form a substantially cylindrical shaped receiving shaft. The terminal portions of the clamping section 38, upon its lateral surface, is flattened as at 44 where the terminal portions of the section project into the tubular body portions 15 and 26. Arranged at each end of the receiving shaft 36, and fitting in suitable aligning recesses provided in the shaft sections 37 and 38 to opposite sides of the longitudinally extending way 41, are expansion springs 45 which as will be observed in Figure 15, serve to normally urge the shaft sections away from one another for formation of a paper or sheet receiving slot 46 extending thruout the length of the receiving shaft.

Mounted between each of the sets of flanges 17 and 28 of the caps 14 and 25 respectively, is a clamping member 48. These clamping members 48 consist of a mounting block 49 which is pivotally mounted between the cap flanges at a point intermediate the ends of the flanges, and rigidly affixed to one face of the block 49 is an operating arm 50 provided with a spring shoe 51 which is intended to engage the flattened surface 44 when the arms 50 point inwardly and longitudinally of the carrier shaft for yieldably forcing the minor or clamp section 38 toward the major shaft section 37. A stop pin 52 extends between the cap flanges inwardly of the block 49 and acts to limit movement of the free ends of the arms 50 toward the shaft clamp section 38 and also retains the spring shoe 51 in contact with the flattened surfaces 44. Thus it will be seen that when the arms 50 are swung to extend inwardly from the ends of the carrier shaft, that the clamp section 38 is moved for moving the clamping face 43 toward the clamping face 40 against the action of the springs 45. In Figure 6 it will be seen that when the clamp members 48 are swung to an inoperative position, that the springs 45 are free to act for forcing the clamping shaft section 38 away from the shaft section 37.

Arranged to removably fit within the channel or way 41 of the major shaft section 37, is an alignment retention means 55 which acts for retaining the shaft sections 37 and 38 in proper longitudinal alignment when the device is operated for tightening the sheet of

drawing material. This means 55 embodies a dove-tailed mounting or slide strip 56 which is intended to slidably fit within the dove-tailed groove 42 for closing the open side of the channel or way 41. This slide strip 56 is of a length equal to that of the receiving shaft 36 so that the opposite ends of the strip abut against the cap end walls 16 and 27. This strip 56 is intended to be inserted in the groove 42 at one end of the shaft section, and when in position has its outer face aligning with the clamping face 40 as clearly illustrated in Figures 5 and 15. Carried in spaced relation at the inner side of the slide strip 56, are suitable U-shaped brackets 57 the arms of which preferably engage the side walls of the way 41 as illustrated in Figure 13. Provided in the slide strip 56 at each of the brackets 57, is a guide opening 58 which opens at the clamping face 40 and aligns with a correspondingly shaped opening 59 provided in the minor shaft section 38. Mounted for sliding movement in the opening 58 of the strip 56, is a suitable aligning pin 60 which when projected extends into the opening 59 in a manner whereby the shaft sections 37 and 38 will be retained in alignment one with another. These pins 60 are normally urged inwardly into the way or channel 41 as by means of a suitable expansion spring 61 which encircles the pin at the inner side of the slide strip and acts upon a stop pin as illustrated in Figures 10 and 13. Mounted in suitable guide plates 62 carried by the slide strip 56, and movable longitudinally in the channel 41, is a cam actuating rod 63 having one end projecting thru the cap wall 16 and operating wheel 20 and provided with a suitable knob 64, and having its opposite end projecting thru the cap wall 27 and arcuate slot 35 of the adjusting knob 30. Thus it will be seen that the rod 63 is free to be moved longitudinally of the receiving shaft 36 by gripping the knob 64 at the outer side of the operating knob 20. Pivotally mounted upon one arm of each of the brackets 57, as by means of a suitable pivot pin 65, is a cam 66 provided with a cam surface 67 terminating at the end of the cam in a flat surface 68. Pivotally connected at one end to the rod 63 at each of the brackets 57, and having its opposite end pivotally connected with the cams 66, is a cam link 70 which acts for rocking the cam upon longitudinal movement of the actuating rod 63. By observing Figure 11 it will be seen that when the actuating rod 63 is moved longitudinally in the direction of the arrow, that the link 70 will swing the cam 66 so that the cam surface 67 acts upon the pin 60 and forces the same upwardly thru the opening 58 into the aligning opening 59 until the flat surface 68 engages the inner end of the pin and acts as means for preventing the pin from moving inwardly out of the opening 59 until the operator grasps the actuating rod knob 64 and draws outwardly on the same for allowing inward movement of the aligning pins 60. It will be seen that the springs 61 serve for retaining the aligning pins 60 in contact with the cam surfaces 67 and flattened surfaces 68 when the cams are in either of their adjusted positions.

It will be seen that when the aligning pins 60 are moved outwardly by means of the cams 66, that the pins puncture or pass thru the sheet of drawing material C and act as means for more effectively preventing the sheet from having any sliding movement between the separable shaft sections 37 and 38.

It will be noted that the slide strip 56 serves as a mounting for the operating parts of the alignment retention means, and thus permits of the means 65 to be fully assembled upon the strip 56 as a support and then inserted longitudinally into the channel or way 41 of the major shaft section 37.

By so providing the arcuate slot 35 in the knob 30, such will allow for the end of the rod 63 to project thru the adjustable knob and allow for the cams 66 to be operated from that end of the holder when such becomes necessary.

In operation of the device for drawing and holding the sheet of drawing material in a taut and smooth position over the working surface of the drawing board or table, the cam actuating rod 63 is first moved toward the operating knob 30 as by means of the button 64 for operating the cam 66 and allowing the aligning pins 60 to be retracted into the channel 41. The clamping members 48 are then freed for bringing the same to a position as illustrated in Figure 6 and which will allow the expander springs 45 to move the minor shaft section 38 away from the major shaft section 37 for providing the receiving slot 46. A sheet of material is then inserted into the slot 46 and partially drawn so that the same lies relatively smooth upon the drawing board surface, and after which the clamping members 48 are swung to a position as illustrated in Figure 4 for moving the shaft section 38 toward the shaft section 37 so that the sheet of material is firmly clamped between the clamping faces 40 and 43. The actuating rod 63 is then moved inwardly in the direction of the arrow as in Figure 4 for swinging the cams 66 and forcing the aligning pins 60 thru the material into the openings 59 whereby the shaft sections 37 and 38 are retained in perfect alignment. The operator then grasps the operating knob 30 and rotates the same in the proper directions, preferably in a counter-clock-wise direction for rotation of the receiving shaft as in Figure 1, and which rotation of the shaft will cause the drawing sheet to be drawn taut and smooth over the working surface of the board A. The expansion springs

24 will permit of the knobs 20 and 30 to readily pass the teeth 12 and 12′ respectively when the shaft is being rotated in the counter-clock-wise direction. As the knob 30 rides past the teeth 12′, there will be a slight longitudinal shifting of the entire receiving shaft 36. Should it become necessary and desirable to slightly twist one end of the shaft for obtaining even tension on the sheet C, the operator may grasp the knob 30 and slightly turn the same in a counter-clock-wise direction for stretching that edge of the sheet adjacent the cap 25, and it will be seen that the shaft may only be shifted slightly when the nuts 34 are in binding engagement with the knob 30. The nuts 34 are normally in binding engagement with the knob 30 at all times after initial application of the holder to the edge of the drawing board, the principal reason for having the knob 30 adjustable as shown is to permit of the teeth 12 and 12′ to be in proper alignment with their respective knobs 20 and 30. It will not be found necessary to adjust the ratchet knob 30 after each insertion of a new sheet between the separable sections of the receiving shaft.

In releasing the sheet C from the holder, the tension nuts 23 are first backed along the bolts 22 for relieving the tension of the springs 24, after which the operator grasps the lever or arm 18 and moves the cap 14 away from the knob 20 thereby releasing the knob 30 from holding engagement with the teeth of the bearing ring 7′. When so moving the arm 18 it will be seen that the entire receiving shaft is moved longitudinally toward the bracket 6, and that the opening 29 formed by the shortening of the flanges 28 allows for the cap 25 to have limited movement outwardly thru the ring 7′. The operator then grasps the knob 20 and draws the same out of engagement with the teeth 12 against the tension of the springs 24 and which will allow for the receiving shaft to be rotated in an opposite or clockwise direction for loosening the grip on the sheet C. Thus it will be observed that it is necessary for the operator to use both hands when releasing the tension on the drawing sheet, and this is accomplished from one end of the holder, and namely that end provided with the releasing cap 14. After so rotating the receiving shaft, the operator pulls outwardly on the knob 64 for allowing the aligning pins 60 to be retracted, and then releases the clamping members 48 so that the sheet may be readily withdrawn from the slot 46.

An alternative method of releasing the sheet would be to loosen the nuts 23 to such an extent on the bolts 22 that the springs 24 have no action upon the knob 20, and then when the shaft 36 is shifted longitudinally for freeing the knob 30, the shaft will remain in its shifted position and the operator has only to draw outwardly on the knob 20 and turn the same so as to loosen the tension on the drawing sheet upon a slight rotation of the knob 20.

By so having the holder operable entirely from one end, it will be seen that the holder may be of considerable length and be readily operated by a single operator, since the far end of the holder may be released from the normal operating end of the holder.

From the foregoing description it will be apparent that a novel and improved drawing sheet holder and tightener has been provided embodying a novel arrangement whereby a sheet of drawing material may be effectively held against liability of the sheet becoming torn during tightening of the holder for drawing the sheet in a taut and smooth position upon a flat surface, and embodying ratchet means arranged at opposite ends of the holder for insuring proper tightening of the sheet, and which ratchet means is releasable from one end of the holder thus enabling a single operator to readily perform the releasing and tightening operations from one end of the holder, should the same be of considerable length whereby the operator could not reach opposite ends of the holder for simultaneous releasing thereof.

Changes in detail may be made to the specific form of the invention herein shown and described, without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. A holder and tightener of the class described comprising a pair of mounting brackets, a longitudinally divided receiving shaft rotatably supported at its end in said brackets and embodying major and minor shaft sections, clamping members for yieldably moving the major and minor shaft sections into clamping relation with one another, ratchet means provided at each end of said shaft for preventing counter-rotation thereof out of a tension forming position, and alignment retention means for the shaft sections embodying alignment pins carried by the major shaft section and movable into aligning openings provided in the minor shaft section and cam means for actuation of said pins.

2. A holder and tightener of the class described comprising a pair of mounting brackets provided with ratchet teeth, caps rotatably mounted in each bracket, a longitudinally divided receiving shaft having its ends secured in said caps for rotation therewith, ratchet knobs carried by each cap and engageable with the ratchet teeth of said brackets, yieldable clamping members pivotally carried by each cap and engageable with one of said shaft sections for moving the same into clamping relation with the companion shaft section, and alignment retention means

embodying alignment pins carried by one of said shaft sections and movable into the companion shaft section.

3. A holder and tightener of the class described comprising a pair of mounting brackets, a longitudinally divided receiving shaft rotatably supported at its ends in said brackets and embodying major and minor shaft sections, said major shaft section having a channel extending longitudinally thereof, yieldable means for moving the shaft sections into clamping relation with one another, ratchet means provided at each end of said shaft for preventing counter-rotation thereof out of a tension forming position, said shaft sections having aligning openings provided therein, shaft alignment pins slidable in said aligning openings, an actuating rod movable longitudinally of the major shaft section in the channel thereof, and cam means operable by said rod for actuation of said pins.

4. A holder and tightener of the class described comprising a pair of mounting brackets, a longitudinally divided receiving shaft rotatably supported at its ends in said brackets and embodying major and minor shaft sections, said major shaft section having a channel extending longitudinally thruout the length thereof, a slide strip closing the open side of said channel, alignment pins slidable in the slide strip and movable into aligning openings provided in the minor shaft section, a cam member pivotally mounted in said channel for each of said alignment pins, and an actuating rod movable longitudinally in said channel for actuation of said cam members.

5. In a holder and tightener of the class described, a pair of mounting brackets, a longitudinally divided receiving shaft rotatably supported at its ends in said brackets and embodying major and minor shaft sections, said shaft sections forming confronting clamping faces and said major shaft section having a longitudinally extending channel opening at the clamping face of the major shaft section, a slide strip insertable longitudinally into the channel and lying flush with the clamping face of the major shaft section, alignment pins carried by and movable transversely of the slide strip for movement into aligning openings provided in the minor shaft section, brackets carried by the slide strip and arranged in said channel, a cam pivotally carried by each bracket and engageable one with each of said pins, an actuating rod movable longitudinally of the major shaft section in said channel for operating said cams, and yieldable clamping means for moving said shaft sections into clamping relation.

6. In a holder and tightener of the class described, a longitudinally divided receiving shaft embodying major and minor shaft sections, said major shaft section having a channel extending thruout the length thereof and having dove-tailed grooves provided at the open side of the channel, caps arranged over the ends of the receiving shaft for retaining the shaft sections in assembled relation, a dove-tailed slide strip insertable into said grooves from one end of the receiving shaft, alignment pins slidably mounted in the strip for movement outwardly of said channel into aligning openings provided in the minor shaft section, a bracket carried by the strip for each of said pins, a cam pivotally carried by each bracket and embodying a flattened portion for retaining the pins in their projected positions, an actuating rod movable longitudinally in said channel, an operating link connecting each cam with the actuating rod, and yieldable means for moving the shaft sections into clamping relation.

7. A holder and tightener of the class described comprising a pair of mounting brackets embodying bearing rings having ratchet teeth provided at their outer edges, caps rotatably mounted at their outer ends in each of said bearing rings embodying tubular portions being closed at their outer ends by ends walls, a longitudinally divided receiving shaft mounted at its ends in the tubular portion of the cap for rotation therewith, clamping members carried by each cap for moving the sections of the shaft into clamping relation, alignment retention means for the shaft sections, an adjusting knob carried by the end wall of one of said caps and having ratchet teeth engageable with the ratchet teeth of its companion ring, an operating knob yieldably carried by the end wall of the opposite cap and having ratchet teeth engageable with the ratchet teeth of its companion bearing ring, and means carried by said last mentioned cap for moving the receiving shaft longitudinally for freeing said adjusting knob from that end of the shaft bearing the operating knob.

8. A holder and tightener of the class described comprising a pair of mounting brackets, release and bearing caps respectively mounted for rotation one in each of said brackets, said caps each embodying a tubular portion being slotted longitudinally and having flanges extending along each side of the slot, a longitudinally divided receiving shaft having its ends supported in said tubular portions for rotation therewith and embodying major and minor shaft sections, means for normally urging said shaft sections away from one another, yieldable clamping members pivotally mounted between the flanges of each of said tubular cap portions and engageable with said minor shaft section for moving the section toward the major shaft section, ratchet knobs carried by each of said caps and engageable with their respective mounting brackets for preventing counter-rotation of the shaft out of a tension forming

position, and means for retaining the shaft sections in proper alignment embodying keeper pins slidably mounted in one of said shaft sections and movable outwardly thereof into aligning openings of the companion shaft section.

9. A holder and tightener of the class described comprising a pair of mounting brackets each embodying a bearing ring having ratchet teeth provided at its outer edge, release and bearing caps rotatably mounted one in each of said bearing rings and each embodying a tubular portion having an end wall closing its outer end, a longitudinally divided receiving shaft having its ends mounted in said tubular portions with the ends of the shaft abutting with the end walls of said caps, said caps having slight longitudinal movement in said bearing rings, an adjusting knob adjustably carried by the end wall of the bearing cap and having ratchet teeth engageable with the ratchet teeth of its companion bearing ring, an operating knob carried by the end wall of the release cap and having yieldable movement toward and away from the end wall, said operating knob having ratchet teeth engageable with the ratchet teeth of its companion bearing ring, clamping members carried by each cap for moving the sections of the shaft into clamping relation, a release arm projecting from the release cap for shifting the receiving shaft longitudinally away from its bearing ring, and alignment pins carried by one of said sections and engageable with the companion section for retaining the shaft sections in alignment when the shaft is under tension.

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