March 11, 1958 E. J. HUFF 2,825,971

ANGLE SETTING CONTROL FOR DRAFTING INSTRUMENTS

Filed Jan. 28, 1954 2 Sheets-Sheet 1

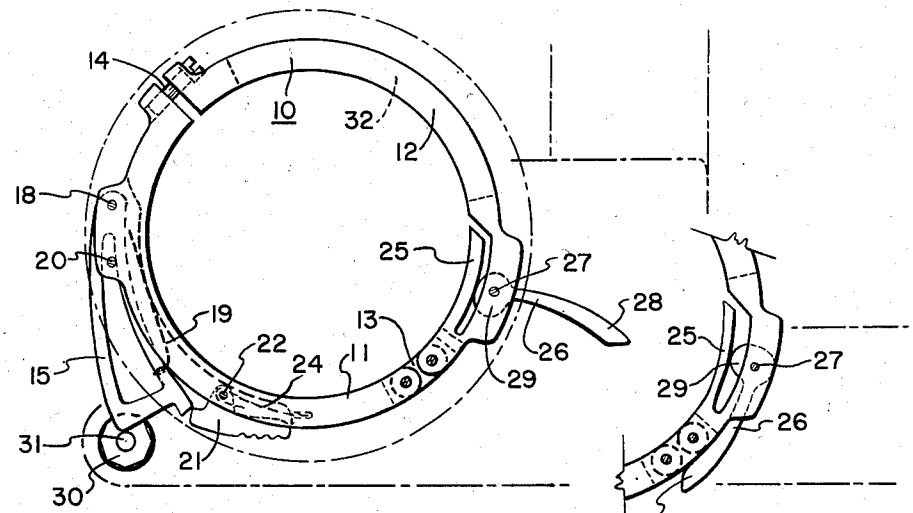


FIG. 1

FIG. 2

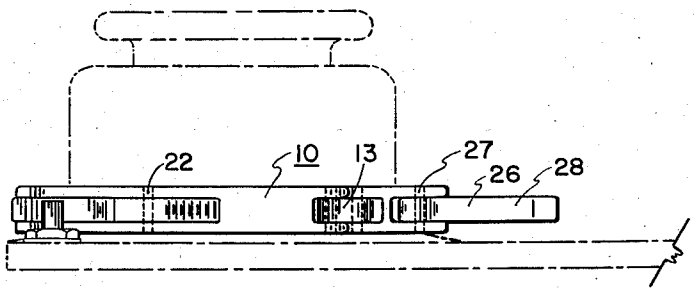


FIG. 3

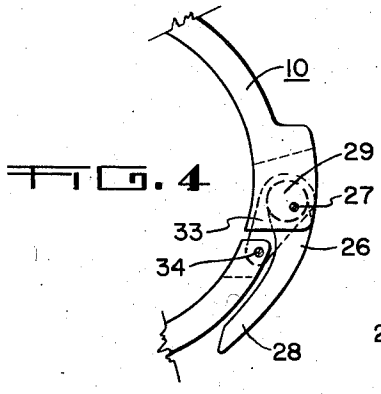


FIG. 4

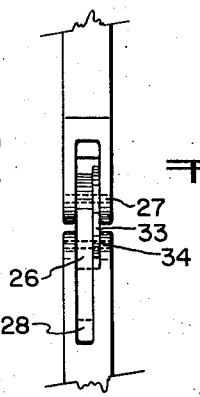


FIG. 5

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ANGLE SETTING CONTROL FOR DRAFTING INSTRUMENTS

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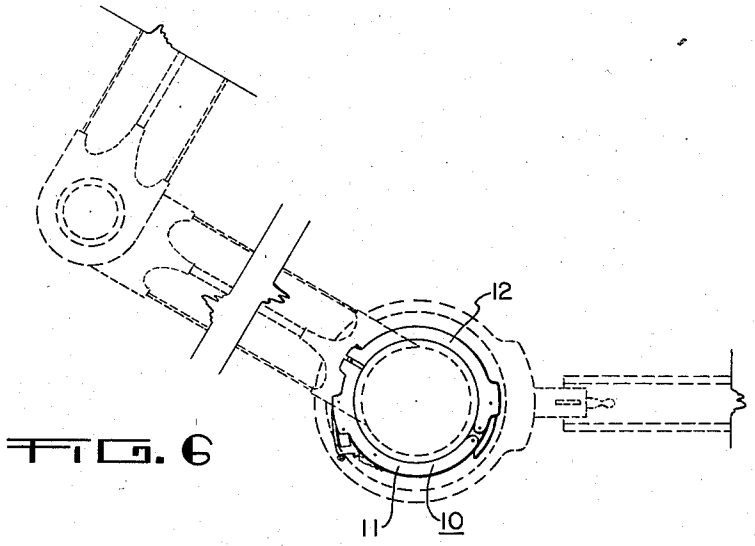


FIG. 6

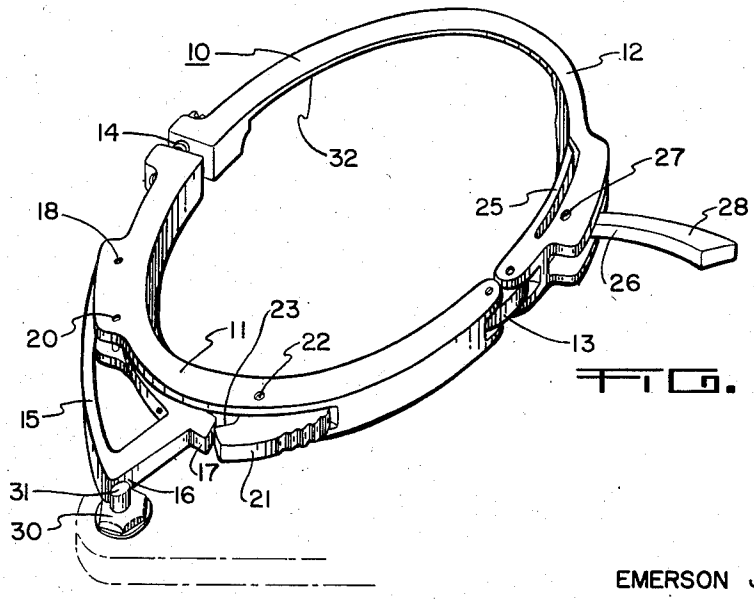


FIG. 7

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ANGLE SETTING CONTROL FOR DRAFTING INSTRUMENTS

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4 Claims. (Cl. 33—79)

This invention relates to an angle setting control for drafting instruments.

The orientable heads of certain conventional drafting instruments such as the Bruning are provided with a ring which is connected to the moveable arms of the instrument and on which is rotatably mounted a support to which the drafting instruments are attached. The draftsman can move the ring to any desired position on the drafting board by means of a control knob. The support is normally locked in position so that one arm of the drafting instruments is in horizontal position, parallel to the base of the drafting board and the other arm is perpendicular thereto. An automatically acting bolt is provided which enables the support to be locked in other predetermined positions, which are customarily every fifteen degrees off from horizontal. It is also possible for the draftsman to change the basic angle from horizontal to any desired angle and work with fifteen degree variations therefrom.

If, however, the draftsman desires to use any angle other than the basic angle for which the instrument is set or a fifteen degree variation therefrom, it is necessary for him to set such angle by the use of the protractor. If the angle is left to work at another angle, it must be re-set by visual reference to the protractor. In practice, it is difficult if not impossible for the draftsman to make precisely the same setting the second time that he made the first time. In such case, the angle is slightly different and the drawing is sligthly off from the previous angle, resulting in inaccuracy in the drawing.

It is an object of my invention to provide an angle setting control which will permit the draftsman to set the arms for any angle whatsoever with respect to the basic angle. He can then leave the set angle to move to the basic angle or to any other angle and at any later time return to the set angle, with my control providing precisely the same set angle as that previously used.

It is a further object of my invention to provide such a control which will not interfere in any way with the other operations of the drafting instrument, but which will provide the aforesaid advantages and benefits in addition to those already provided by the instrument.

My invention also comprises such other objects, advantages and capabilities as will later more fully appear and which are inherently possessed by my invention.

While I have shown in the accompanying drawings and described herein a preferred embodiment of my invention, it should be understood that the same is susceptible of modification and change without departing from the spirit of my invention.

Referring to the drawings, Fig. 1 is a top plan view of my device with the brake in unlocked position;

Fig. 2 is a top plan view of the brake, showing the same in locked position;

Fig. 3 is a side elevational view of my device;

Fig. 4 is a top plan view of another embodiment of my brake;

Fig. 5 is an end elevational view of the same;

Fig. 6 is a reduced top plan view of my device in use, showing the drafting instrument in dotted lines;

Fig. 7 is a perspective view of my device.

A preferred embodiment which has been selected to illustrate my invention comprises an angle setting ring 10, which is rotatably mounted on the non-rotating part of the head of the drafting machine. Ring 10 is formed of two semicircular members 11 and 12, which are joined together at one end by a hinge link 13, so that ring 10 may be opened for attachment to the drafting instrument. The opposite ends of members 11 and 12 are fastened together by a set screw 14, which extends through screw threaded openings in flanges adjacent the ends of members 11 and 12 to hold ring 10 in place on the drafting instrument.

A spring loaded trigger and release assembly is provided on member 11 of ring 10. Such assembly comprises a substantially triangular trigger 15, which extends outwardly from ring 10 to provide a substantially right angle stop portion 16. Positioned adjacent the outer circumference of ring 10 is a small hook portion 17 which is integral with trigger 15. Trigger 15 is pivotally attached to ring 10 by a pivot pin 18. A small wire spring 19 is positioned between trigger 15 and ring 10 to bias trigger 15 in an outward direction from ring 10. A pin 20 limits the outward movement of trigger 15.

A spring loaded trigger release 21 is pivotally mounted on a pin 22 which extends through member 11 of ring 10 adjacent trigger 15. Trigger release 21 is provided with a small catch portion 23, which is normally biased downwardly by a small wire spring 24.

The other member 12 of ring 10 is provided with a brake which is adapted to bear against the head of the drafting movement and prevent the rotation of ring 10. A brake shoe 25 is formed from an integral elongated portion of member 12 and is slightly yieldable. A lever 26 is pivotally mounted on a pin 27 which extends through member 12 adjacent brake shoe 25. Lever 26 has a finger portion 28 and an eccentric portion 29. When finger portion 28 is in its outward position, extending at a right angle to ring 10 as shown in Fig. 1 of the drawings, brake shoe 25 is concentric with the inner circumference of ring 10. This is the released or unlocked position of my brake.

When finger portion 28 is in its inward position, extending alongside ring 10 as shown in Fig. 2 of the drawings, the side of eccentric portion 29 engages brake shoe 25. Because of the oval or eccentric shape of eccentric portion 29, the distance from pin 27 to the side of eccentric portion 29 is greater than the distance from pin 27 to the end of eccentric portion 29. In order to accommodate the larger side of eccentric portion 29, brake shoe 25 is forced inwardly toward the center of ring 10. Brake shoe 25 thus bears against the head of the drafting instrument to prevent the rotation of ring 10 when the brake is in locked position.

A stop is provided in the form of a knob 30 having a shaft 31 which projects upwardly into the path of trigger 15 when trigger 15 is in its outward position. The drafting instrument is provided with a hexagonal nut which is a part of the leveling adjustment of the instrument. This nut is removed and replaced with my knob 30 to provide a stop means for my control device.

In use, all that need be done to install my device is to replace the hexagonal nut with my knob 30 and attach ring 10 to the head of the instrument. Ring 10 pivots open on hinge link 13 and is fastened in place by the tightening of set screw 14.

In order to set my angle control to hold the particular angle at which the drafting instrument is set, finger portion 28 of lever 26 is moved outwardly, releasing brake

shoe 25 from bearing engagement with the head of the drafting instrument. Trigger release 21 is depressed so that its catch portion 23 is moved upwardly, freeing hook portion 17 of trigger 15 to permit trigger 15 to move to its outward position.

Ring 10 is then rotated in a counterclockwise direction until stop portion 16 of trigger 15 strikes against shaft 31 of knob 30, as shown in Figs. 1 and 7 of the drawings. This prevents any further rotation of ring 10. If ring 10 is rotated in a clockwise direction, it is moved until trigger 15 is depressed by cam action as it passes shaft 31. Trigger 15 is moved toward ring 10 short of engagement between catch portion 23 and hook portion 17 and snaps back with a clicking sound. When this occurs the direction of rotation is reversed to move the head in a counterclockwise direction until stop portion 16 of trigger 15 abuts against shaft 31.

The brake is then applied by moving finger portion 28 of lever 26 toward ring 10, bringing brake shoe 25 into engagement with the head of the drafting instrument. This prevents any further rotation of ring 10 with respect to the head of the drafting instrument.

When the draftsman is ready to leave the set angle temporarily, he presses trigger 15 toward ring 10 until hook portion 17 becomes engaged with catch portion 23 of trigger release 21. The head of the drafting instrument may then be moved to any angle desired.

When the draftsman desires to return to the angle for which my control has been set, he need only press trigger release 21 to release trigger 15 to its outward position. The head of the drafting instrument is then rotated in a counterclockwise direction until stop portion 16 of trigger 15 strikes shaft 31 of knob 30. If the head is moved in a clockwise direction, it is moved until trigger 15 clicks as it passes shaft 31 and the movement is then reversed until stop portion 16 contacts shaft 31. The head is then back at the exact original angle for which my control was set. The angle is precisely the same as that previously set and no resetting or measurement is necessary.

It may be noted that my device does not interfere in any way with the operation of the drafting instrument. Knob 30 merely replaces a locknut and does not effect the operation of the leveling adjustment. Member 12 of ring 10 is provided with a cutaway portion 32 to clear a ring nut which might interfere with ring 10 on some models of drafting instruments.

An alternative form of my brake is shown in Figs. 4 and 5 of the drawings. In this embodiment, the same lever and pin construction are used, but in connection with a small link 33, which is attached by a pin 34 to a portion of member 12 which is separated from the point of attachment of lever 26. When the finger portion 28 of lever 26 is positioned alongside ring 10, the brake is in unreleased or locked position. When the finger portion 28 is moved outwardly at a right angle, the diameter of ring 10 is effectively expanded to release ring 10 and permit its rotation with respect to the head of the drafting instrument. This is accomplished by the movement of pin 27 upwardly toward the upper end of link 33, since the distance from pin 27 to the side of eccentric portion 29 is shorter than the distance from pin 27 to the top of eccentric portion 29.

It should also be understood that other suitable types of brake means may be employed.

I claim:

1. An angle setting control for drafting instruments of the type having a rotatable head and a non-rotatable stop member disposed adjacent thereto, said control comprising a circular ring, said ring being formed of a pair of semi-circular members joined at one end by a hinged link and at the opposite end by disconnectable fastening means, a substantially triangular trigger member pivotally attached to said ring, the outer surface of said trigger member being curved to provide a cam surface, spring means biasing said trigger member toward an outward position in which it projects beyond the outer circumferential edge of said ring, said trigger member having a substantially right angle stop portion at one end of said cam surface, said trigger member having a catch portion, a trigger release pivotally attached to said ring adjacent said trigger member, said trigger release having a hook portion engageable with the catch portion of said trigger member, spring means acting on said trigger release to hold said hook and catch portions in engagement to prevent the movement of said trigger member to outward position, said trigger release being manually pivotable to release said hook in catch portions and permit movement of said trigger member to outward position, brake means carried by said ring, said brake means being manually movable to an operative and a non-operative position, said brake means in operative position contracting said ring into frictional engagement with the head of the drafting instrument to prevent rotation of said ring with respect thereto, said brake means in non-operative position expanding said ring to permit rotation thereof with respect to said head, the right angle stop portion of said trigger member acting when said trigger member is in outward position to engage the stop member on the drafting instrument and prevent rotation of the head in one direction, the cam surface of said trigger member engaging said stop member to move said trigger member inwardly against its spring means to permit rotation of the head in the opposite direction when said trigger member is in outward position, said trigger member when not in outward position being non-engageable with said stop member.

2. An angle setting control for drafting instruments of the type having a rotatable head and a non-rotatable stop member disposed adjacent thereto, said control comprising a circular ring, a trigger member attached to said ring, spring means biasing said trigger member toward an outward position in which it projects beyond the outer circumferential edge of said ring, said trigger member having a catch portion, a trigger release pivotally attached to said ring adjacent said trigger member, said trigger release having a hook portion engageable with the catch portion of said trigger member, spring means acting on said trigger release to hold said hook and catch portions in engagement to prevent the movement of said trigger member to outward position, said trigger release being manually pivotable to release said hook and catch portions and permit movement of said trigger member to outward position, brake means carried by said ring, said brake means being manually movable to an operative and a non-operative position, said brake means in operative position contracting said ring into frictional engagement with the head of the drafting instrument to prevent rotation of said ring with respect thereto, said brake means in non-operative position expanding said ring to permit its rotation with respect to said head, said trigger member acting when in outward position to engage the stop member on the drafting instrument and prevent rotation of the head, said trigger member when not in outward position being non-engageable with said stop member.

3. An angle setting control for drafting instruments of the type having a rotatable head and a non-rotatable stop member disposed adjacent thereto, said control comprising a circular ring, a trigger member attached to said ring, spring means biasing said trigger member toward an outward position in which it projects beyond the outer circumferential edge of said ring, manually operable means for holding said trigger member away from said outward position against the pressure of said spring means, brake means carried by said ring for selectively permitting and preventing manual rotation of said ring with respect to the head of the drafting instrument at any point on the circumference of said drafting instrument, said trigger member acting when in outward position to engage the stop member on the drafting instrument and prevent rotation of the head, said trigger member when

not in outward position being non-engageable with said stop member.

4. The subject matter of claim 3, said brake means being manually movable to an operative and a non-operative position, said brake means in operative position contracting said ring into frictional engagement with the head of the drafting instrument to prevent rotation of said ring with respect thereto, said brake means in non-operative position expanding said ring to permit its rotation with respect to the head of the drafting instrument.

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