April 19, 1960 J. DOUGLASS, JR 2,932,867

CLAMPING DEVICES

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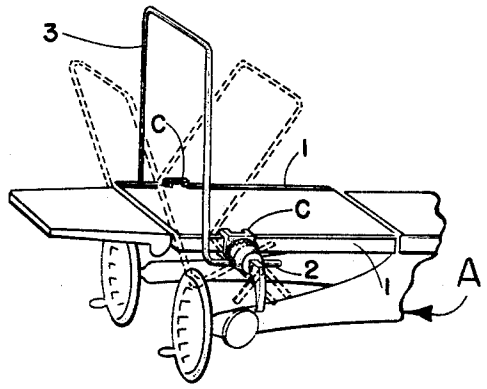

FIG. 1.

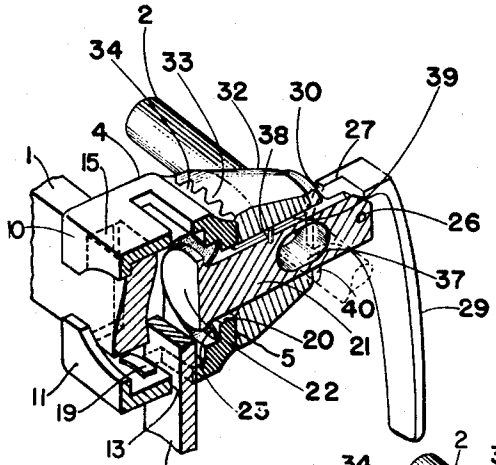

FIG. 2.

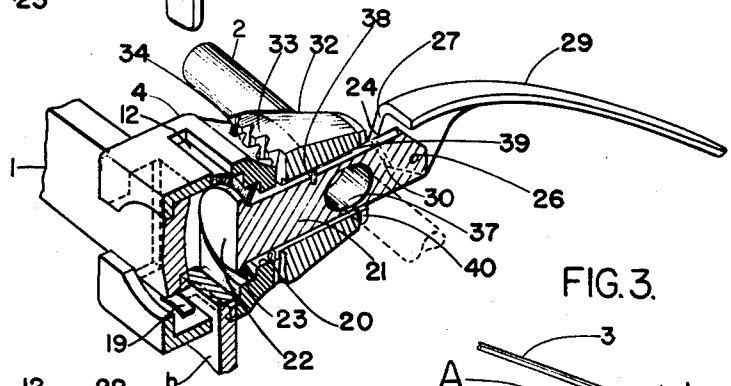

FIG. 3.

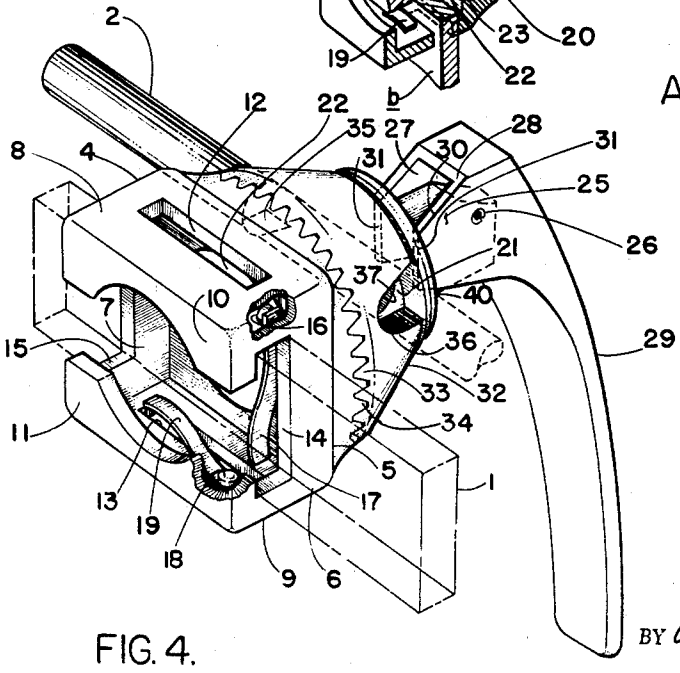

FIG. 4.

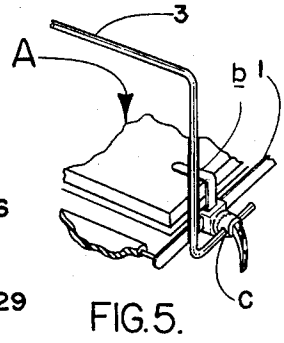

FIG. 5.

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CLAMPING DEVICES

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11 Claims. (Cl. 24—81)

This invention relates to certain new and useful improvements in clamping devices.

Most surgical operating tables are provided along their lateral margins with side rails for purposes of mounting various types of operating table accessories. One such accessory found on an operating table is an anesthetist's screen which ordinarily consists of a heavy U-shaped rod which extends transversely of the operating table and is secured at its ends in clamps or sockets mounted on the side rails. The anesthetist's screen must be capable of being shifted to any position along the side rails and also must be capable of being readily tilted to any desired angular position since the location and angle of tilt of the screen is often changed during the course of an operation.

It is, therefore, a principal object of the present invention to provide a clamp which is particularly adaptable for supporting an anesthetist's screen on the side rails of an operating table.

It is also an object of the present invention to provide a clamp of the type stated which is movable to various positions along the side rail and is also quickly locked and unlocked to permit tilting of the screen.

It is a further object of the preesnt invention to provide a clamp of the type stated which positively locks the screen in any selected position of angular adjustment.

It is still another object of the present invention to provide a clamp of the type stated which can be used to simultaneously support an ether screen and shoulder-support bar or similar operating table attachment.

With the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawing (one sheet)—

Fig. 1 is a fragmentary perspective view of an operating table having mounted thereon an anesthetist's screen clamp constructed in accordance with and embodying the present invention;

Fig. 2 is a fragmentary perspective view partly broken away and in section and showing the clamp in the locked position;

Fig. 3 is a fragmentary perspective view partly broken away and in section and showing the clamp in the unlocked position;

Fig. 4 is a perspective view of the clamp partly broken away and showing the clamp in the locked position with the shoulder-support bar removed therefrom; and

Fig. 5 is a fragmentary perspective view of the operating table showing the clamp holding the ether screen and the shoulder-support bar.

Referring now in more detail and by reference characters to the drawing, which illustrates a practical embodiment of the present invention, A designates an operating table comprising side rails 1, 1, having a pair of clamps C, C, which, in turn, support the opposite ends 2, 2, of an anesthetist's screen 3.

The clamp C comprises a hollow socket 4 including a front wall 5 having four successively connected legs 6, 7, 8, 9, integral with and projecting rearwardly therefrom, the legs 8, 9, terminating in spaced opposed flanges 10, 11. Formed in the legs 8, 9, are aligned rectangular openings 12, 13, for slidably receiving an accessory bar *b*, and the legs 6, 7, are cut away to form with the flanges 10, 11, a second pair of aligned rectangular openings 14, 15, for slidably receiving the side rail 1. Rigidly secured at one end to the interior face of the leg 6 by means of a rivet 16 is an arcuate leaf spring 17 which bears against the accessory bar *b*, and similarly secured at one end to the interior face of this leg 9, by means of a rivet 18 is another arcuate leaf spring 19 which bears against the side rail 1. Thus, when the clamp C is mounted on the side rail 1, it may be shifted to any desired position along the length of the side rail 1, and the springs 17, 19, will hold the clamp C and accessory bar *b* firmly in position.

Somewhat centrally thereof, the front wall 5 is provided with a hole 20 for rotatably receiving a stud 21 which terminates within the socket 4 in a diametrally enlarged annular head 22. Concentric with the hole 20 the inside face of the front wall 5 is counterbored for receiving a somewhat frustro-conical spring 23, which is also mounted on the stud 21 intermediate the head 22 and front wall 5. On its outer end the stud 21 is provided with opposed flats 24, 25, and extending diametrally through the stud 21 at the flats 24, 25 is a pin 26 which also slidably projects through a pair of spaced parallel ears 27, 28 on a lever 29, whereby the lever 29 is rockable with respect to the stud 21. The ears 27, 28 are, furthermore, each provided with adjacent forwardly presented flat surfaces 30, 31, the surfaces 30 being a shorter distance radially outwardly of the pin 26 and for purposes presently more fully appearing.

Mounted for axial shifting movement on the stud 21 intermediate the lever 29 and front wall 5 is a frustro-conical ratchet sleeve 32, the inner end of which is provided with a plurality of annular teeth 33 which are adapted to interlock with annularly disposed matching teeth 34, the latter being integrally formed on and projecting outwardly from the front wall 5. The ratchet sleeve 32 is provided at its outer face with aligned U-shaped slots 35, 36 which are aligned with an oval shaped hole 37 extending diametrally through the stud 21. Pressed into the stud 21 intermediate the hole 37 and front wall 5 is a radially outwardly projecting pin 38 which rides in a slot 39 extending lengthwise in the ratchet sleeve 32 and maintains alignment of the slots 35, 36 with the hole 37. Mounted for free-sliding movement on the stud 21 between the lever 29 and ratchet sleeve 32 is a pressure disc 40.

In use, a pair of clamps C, C, are placed on the side rails 1, 1, so that the side rails 1, 1, project through the openings 14, 15. The accessory bars *b* may, if desired, be inserted through the openings 12, 13. Thereafter, with the lever 29 in the position shown in Fig. 3, the opposite ends 2 of the screen 3 are placed in the slots 35, 36, and hole 37. In this position, the ratchet sleeve 32 is in the position shown in Fig. 3, the teeth 33, 34, are disengaged, and the pressure disc 40 is movable along the stud 21. The screen 3, together with the ratchet sleeve 32, stud 21, and lever 29, can then be rotated to any desired angular position and the lever 29 can then be moved to the locked position shown in Figs. 2 and 4. As this is done, the surfaces 31 will bear against the pressure disc 40 which, in turn, applies pressure to the screen end 2. Furthermore, as the lever 29 comes down to the locked position the stud 21 will shift axially a small amount in opposition to the force of the spring 23, and the screen end 2 will be firmly held within the slots 35, 36, and hole 37, while at the same time the teeth 33, 34, will be urged into locking engagement. The clamps C, together with the screen 3, can, if desired, be bodily

shifted along the side rails, and if it is necessary to change the angle of tilt of the screen 3, it is merely necessary to lift upwardly on the lever 29 whereupon the screen 3 can be rotated to another position. The lever can then be moved downwardly to clamp the screen end 2 in the manner previously described.

The clamp C may also be used to hold the anesthetist's screen 3 and a shoulder-supporting bar *b* as shown in Fig. 5. Thus, the socket 4 may be mounted on the side rail 1 so that the side rail 1 projects through the openings 14, 15 while the shoulder-supporting bar *b* can be inserted through the openings 12, 13 allowing the spring 17 to hold the bar *b* in any selected position of elevation. Furthermore, the anesthetist's screen 3 may be locked in any desired position in the manner previously described without interference from the bar *b* or without changing the position thereof.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the clamping devices may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. A clamp comprising a socket, an elongated element rotatably mounted in said socket and projecting outwardly therefrom, resilient means operatively associated with said socket and elongated element, a sleeve mounted concentrically upon and shiftable axially along said elongated element, said sleeve and elongated element cooperating to receive a rod-like member, and releasable locking means for clamping the rod-like member within the sleeve and elongated element and urging said sleeve into grip-forming engagement with said socket in opposition to the force of said resilient means.

2. A clamp comprising a socket, an elongated element rotatably mounted in said socket and projecting outwardly therefrom, resilient means operatively interposed between the elongated element and socket, a sleeve mounted concentrically upon and shiftable axially along said elongated element, said sleeve and elongated element cooperating to receive a rod-like member, and releasable locking means for shifting said elongated element in opposition to the force of said resilient means and thereby clamping the rod-like member within the sleeve and elongated element and at the same time urging said sleeve into grip-forming engagement with the socket.

3. A clamp comprising a socket, an elongated element rotatably mounted in said socket and projecting outwardly therefrom, resilient means operatively interposed between the elongated element and socket, a sleeve mounted concentrically upon and shiftable axially along the length of said elongated element and being rotatable therewith, said sleeve and elongated element cooperating to receive a rod-like member, and releasable locking means for shifting said elongated element in opposition to the force of said resilient means and thereby clamping the rod-like member within the sleeve and elongated element and at the same time urging said sleeve into grip-forming engagement with the socket.

4. A clamp comprising a socket, an elongated element rotatably mounted in said socket and projecting outwardly therefrom, resilient means operatively interposed between the elongated element and socket, a sleeve mounted concentrically upon and shiftable axially along the length of said elongated element and being rotatable therewith, said sleeve and elongated element being provided with aligned apertures for receiving a rod-like member, and releasable locking means for axially shifting said elongated element in opposition to the force of said resilient means and thereby clamping the rod-like member within the sleeve and elongated element and at the same time urging said sleeve into grip-forming engagement with the socket.

5. A clamp comprising a socket provided with a plurality of outwardly presented teeth, a stud rotatably mounted in said socket and projecting outwardly therefrom, a spring operatively interposed between the stud and the socket, a sleeve shiftable along said stud and being rotatable therewith, said sleeve being provided with a plurality of teeth matching the teeth on said socket, said sleeve and stud having aligned apertures therein for receiving a rod-like member, and releasable locking means operable in opposition to the force of said spring for clamping the rod-like member within the sleeve and elongated element and urging the teeth on the sleeve into grip-forming engagement with the teeth on said socket.

6. A clamp comprising a socket provided with a plurality of outwardly presented annular teeth, a stud rotatably mounted in said socket and projecting outwardly therefrom coaxially of said teeth, a spring mounted on said stud inwardly of the socket, a sleeve shiftable along said stud and being rotatable therewith, said sleeve being provided with a plurality of teeth matching the teeth on said socket, said sleeve and stud having aligned apertures for receiving a rod-like member, and releasable locking means operable in opposition to the force of said spring for clamping the rod-like member within the sleeve and elongated element and urging the teeth on the sleeve into grip-forming engagement with the teeth on said socket.

7. A clamp comprising a socket provided with a plurality of outwardly presented teeth, a stud rotatably mounted in said socket and projecting outwardly therefrom, a spring operatively interposed between the stud and the socket, a sleeve shiftable along said stud and being rotatable therewith, said sleeve being provided with a plurality of teeth matching the teeth on said socket, said sleeve and stud having aligned apertures therein for receiving a rod-like member, a lever rockably mounted on the stud, and a pressure-transmitting element operatively interposed between the lever and sleeve and shiftable by said lever, said lever, stud, and pressure-transmitting element cooperating in opposition to the force of said spring to clamp the rod-like member within the sleeve and stud and also to urge the teeth on the sleeve into grip-forming engagement with the teeth on said socket.

8. A clamp comprising a socket provided with a plurallty of outwardly presented annular teeth, a stud rotatably mounted in said socket and projecting outwardly therefrom coaxially of said teeth, a spring mounted on said stud inwardly of the socket, a sleeve shiftable along said stud and being rotatable therewith, said sleeve being provided with a plurality of teeth matching the teeth on said socket, said sleeve and stud having aligned apertures therein for receiving a rod-like member, a lever rockably mounted on the stud, and a pressure-transmitting element mounted on the stud between the lever and sleeve and shiftable by said lever, said lever, stud, and pressure-transmitting element cooperating in opposition to the force of said spring clamp the rod-like member within the sleeve and stud and also to urge the teeth on the sleeve into grip-forming engagement with the teeth on said socket.

9. A clamp for use with mounting members such as bars, rods, and the like, said clamp comprising a hollow socket provided with a pair of aligned openings for slidably receiving a mounting member, resilient means within said socket for impinging firmly against the mounting member and thereby prevent free-sliding movement of the socket when said socket is positioned on the mounting bar, an elongated element rotatably mounted in said socket and projecting outwardly therefrom, a sleeve mounted concentrically upon and shiftable axially along said elongated element, said sleeve and elongated element cooperating to receive a rod-like member, and releasable locking means for clamping the rod-like member within the sleeve and elongated element and urging

said sleeve into grip-forming engagement with said socket.

10. A clamp for use with mounting members such as bars, rods, and the like, said clamp comprising a hollow socket provided with a pair of aligned openings for slidably receiving a mounting member, spring means within said socket for impinging firmly against the mounting member and thereby prevent free-sliding movement of the socket when said socket is positioned on the mounting bar, an elongated element rotatably mounted in said socket and projecting outwardly therefrom, a sleeve mounted concentrically upon and shiftable axially along said elongated element, said sleeve and elongated element cooperating to receive a rod-like member, and releasable locking means for clamping the rod-like member within the sleeve and elongated element and urging said sleeve into grip-forming engagement with said socket.

11. A clamp for use with mounting members such as bars, rods, and the like, said clamp comprising a hollow socket provided with two pairs of aligned openings disposed at right angles to each other, each said pair of openings being adapted to slidably receive a mounting

member, a spring mounted in the socket and associated with each pair of openings for impinging firmly against the mounting member and thereby preventing free-sliding movement of the socket when said socket is positioned on the mounting member, an elongated element rotatably mounted in said socket and projecting outwardly therefrom, a sleeve mounted concentrically upon and shiftable axially along said elongated element, said sleeve and elongated element cooperating to receive a rod-like member, and releasable locking means for clamping the rod-like member within the sleeve and elongated element and urging said sleeve into grip-forming engagement with said socket.

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