June 26, 1962 E. R. WEICKGENANNT 3,041,123

ANESTHETIC SCREEN FOR SURGERY TABLE

Filed March 9, 1959

2 Sheets-Sheet 1

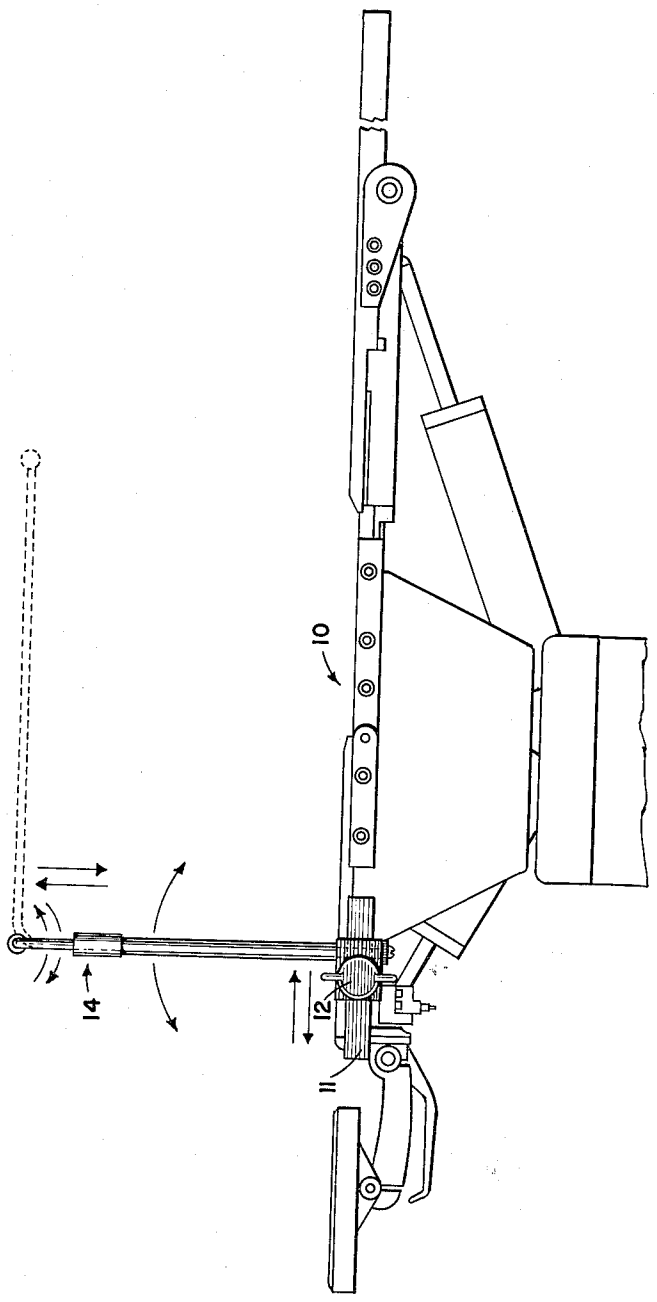


Fig. 1

INVENTOR.
EGON R. WEICKGENANNT

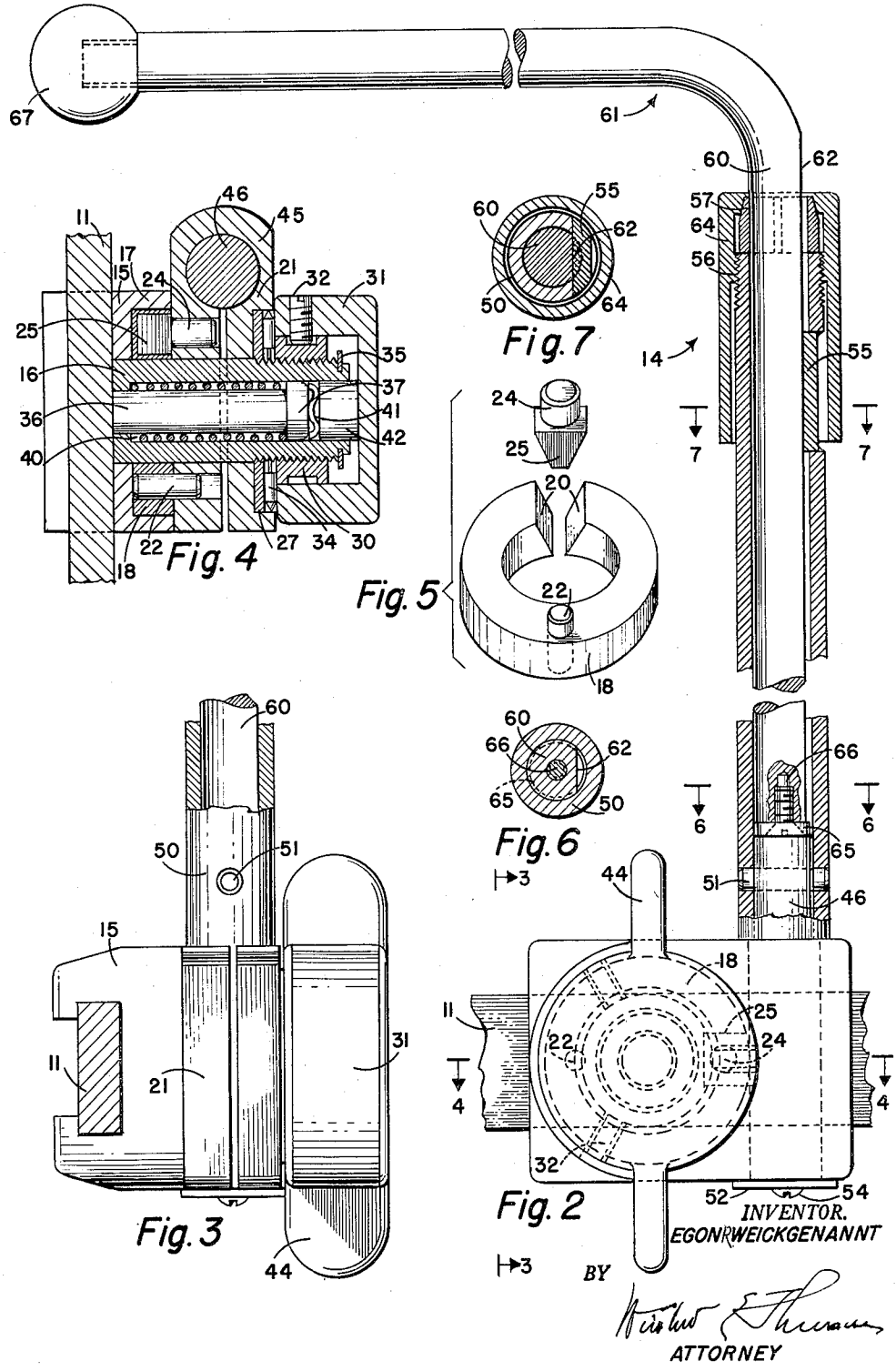
BY

ATTORNEY

June 26, 1962 E. R. WEICKGENANNT 3,041,123

ANESTHETIC SCREEN FOR SURGERY TABLE

Filed March 9, 1959 2 Sheets-Sheet 2



INVENTOR.
EGON R. WEICKGENANNT

BY

ATTORNEY

United States Patent Office 3,041,123 Patented June 26, 1962

3,041,123

ANESTHETIC SCREEN FOR SURGERY TABLE

Egon R. Weickgenannt, Rochester, N.Y., assignor to Ritter Company, Inc., Rochester, N.Y., a corporation of Delaware

Filed Mar. 9, 1959, Ser. No. 798,136
7 Claims. (Cl. 311—10)

This invention relates to a locking clamp that can support a rod in a large number of adjusted positions. More particularly, the invention relates to a locking clamp that can support an anesthetic screen for a surgical operating table from a side rail of the table, in a large number of adjusted positions.

The usual anesthetic screen is a generally U-shaped rod that is supported at each side of the operating table. Usually the U-shaped rod is removed from the table whenever a patient is moved to and from the table, and this necessitates a new, and frequently a complicated, adjustment, on every such occasion. The mechanism that permits adjustment of the position of the rod is complicated, and usually includes one or more parts that project outwardly from the side of the operating table. These projecting parts afford the opportunity for accidental disturbance of the adjustment of the screen, and also present a hazard to movement near the table.

One object of the present invention is to provide a locking clamp for an anesthetic screen that permits the screen to have a substantially universal adjustment, and that is easily locked to hold the screen at any adjusted position.

Another object of the invention is to provide a clamp of general utility for supporting one rod from a second rod or rail, and that permits adjustment of the supported rod to many positions, and that easily locks the rod at any adjusted position.

A more specific object of the invention is to provide a locking clamp for an anesthetic screen, that can be mounted on a rail that extends along the side of a surgical operating table, and that does not project an undesirable distance beyond the side of the table.

Still another object of the invention is to provide a lock of the character described, that is easily operated and that is positive in its locking action.

A further object of the invention is to provide an anesthetic screen that is easily adjusted in height, and that can be quickly and positively locked at any adjusted height.

Other objects of the invention will be apparent hereinafter from the specification and from the recital of the appended claims.

In the drawings:

FIG. 1 is a side elevation of a surgical operating table having an anesthetic screen mounted at the head end of table and held in position by a locking clamp that is constructed according to one embodiment of this invention, showing in dashed lines one position to which the support rod can be moved to swing it clear of the surface of the table, and indicating by pairs of arrows the ways in which the screen can be adjusted;

FIG. 2 is a fragmentary view, partly in elevation and partly in section, on an enlarged scale, of the anesthetic screen and locking clamp shown in FIG. 1;

FIG. 3 is a fragmentary section, partly broken away, taken on the line 3—3 of FIG. 2, looking in the direction of the arrows;

FIG. 4 is a fragmentary section taken on the line 4—4 of FIG. 2, looking in the direction of the arrows;

FIG. 5 is a perspective, exploded view of the ring and wedge that are used in the locking clamp, on an enlarged scale, showing the ring and wedge spaced apart, but in proper relationship to be assembled;

FIG. 6 is a section taken on the line 6—6 of FIG. 2, looking in the direction of the arrows, and

FIG. 7 is a section taken on the line 7—7 of FIG. 2, looking in the direction of the arrows.

According to my invention, an anesthetic screen is provided that can be moved lengthwise of the operating table, and that can be swung to any desired position transversely of the table, and that can be pivoted to any desired inclination relative to the table, as indicated by the arrows in FIG. 1. In addition, the screen itself is telescopically adjustable to permit adjustment of its elevation above the table.

Referring now in detail to the drawings by numerals of reference, 10 denotes a surgical operating table that is equipped, adjacent its head end, with a side rail 11. A locking clamp 12 is mounted on the side rail 11 for slidable movement, in its unlocked position, lengthwise of the table. The anesthetic screen 14 is supported from the locking clamp 12.

The locking clamp 12 includes a generally C-shaped member 15 that is mounted for slidable movement along the rail 11. The member 15 is formed with a bore, and a bushing 16 is engaged in this bore and is brazed to the member. The end of the bushing 16 is disposed to engage against the rail 11 when the member 15 is mounted on the rail. The member 15 is also formed with an axially and outwardly projecting annular flange 17. A split ring 18 is seated within the circular recess that is provided by the flange 17, about the bushing 16. The free ends 20 of the ring are tapered to provide a wedge-shaped seat.

A split clamp 21, that is formed with a transverse bore, is mounted on the bushing 16 with the bushing projecting through the bore, and is disposed to abut against the outer faces of the flange 17 and of the ring 18. The inner face of the split clamp 21 is formed with a pair of holes that are disposed about axes that are parallel to the axis of the bushing 16 and that are, respectively, on diametrically opposite sides of the bushing. A pin 22 is seated in one of these holes and projects into a corresponding hole that is formed in the split ring 18. The cylindrical shank 24 of a wedge pin 25 is seated in the other hole, and the wedge portion of this pin is seated between the tapered ends 20 of the split ring 18.

The outer face of the split clamp 21 is formed with a disc-shaped recess that is coaxial with the bore through which the bushing 16 projects. A steel bearing washer 27 is disposed in this recess. The outwardly projecting end of the bushing 16 is threaded, and a lock nut 30 is threaded onto the end of the bushing. A cap 31 is secured to the nut 30 by set screws 32, and needle bearings 34 are interposed between the confronting faces of the washer 27 and of the nut 30 and cap 31. A snap ring 35 is engaged in a recess at the end of the bushing 16, to limit the outward movement of the nut 30 on the bushing 16.

A plunger or lock pin 36, that is preferably made of nylon or the like, is mounted for reciprocatory movement in the bore of the bushing 16. The plunger 36 is generally cylindrical in shape and has an end 37 of enlarged diameter that engages the wall of the bore of the bushing 16 and guides the plunger in its movement. A coil spring 40 is mounted around the plunger 36 and is interposed between the shoulder that is provided by the enlarged end 37 and the bushing 16, constantly to urge the plunger 36 in one direction away from the rail 11. A crimped spring washer 41 is interposed between the face of the plunger end 37 and a plastic disc 42 that abuts against the inner face of the cap 31.

A pair of ears 44 (FIGS. 2, 3) are soldered or other-

wise secured to the cap 31, diametrically opposite each other, to provide grips to make rotation of the cap 31 more convenient.

The split clamp 21 is formed with an extension 45 that projects to one side of the locking device, and that is formed with a bore within which a stud 46 is disposed. A retainer 52 is secured to the lower end of the stud 46 by a screw 54, to hold the stud 46 against axial movement relative to the bore in which it is disposed. The upper end of the stud 46 projects above the upper surface of the extension 45, as shown in FIG. 2. The lower end of a length of tubing 50 is engaged over the projecting upper end of the stud 46, and a pin 51 is passed through diametrically aligned holes in the wall of the tubing and a transverse bore in the stud 46, so that the tubing 50 and stud 46 move together as a unit.

The tubing 50 is slit, adjacent its upper end, to provide a tongue 55 that is bent inwardly. The tubing 50 is threaded adjacent its upper end, as denoted at 56. A steel chuck 57, that is split longitudinally, is mounted to abut against the upper end of the tubing 50 and is generally coaxial therewith. The chuck 57 is tapered at its upper end.

The lower branch 60 of an arm 61 has a flattened portion 62, and this lower branch 60 is disposed within the bore of the tubing 50, with the tongue 55 resiliently engaged against the flattened portion 62, to hold the arm 61 against rotary movement relative to the tubing 50. An internally threaded barrel 64 is threaded onto the upper end of the tubing 50, and is provided with a neck that has a taper that is complementary to the taper of the chuck 57, to permit compression of the chuck upon axial movement of the barrel 64 in one direction.

A steel stop washer 65 is secured to the lower end of the branch 60 of the arm 61 by a screw 66, or in any other convenient manner, as a wear part.

A ball 67 is secured to the free end of the arm 61 to provide a smooth means by which the end of the arm may be grasped conveniently.

To use the locking clamp, the cap 31 is rotated in a counter clockwise direction relative to FIG. 2, preferably using the ears 44 to obtain leverage, to back the cap 31 off the bushing 16 a short distance. Then, by grasping the tubing 50 or the cap 31, or both, the screen is moved to any desired position lengthwise of the table 10, by causing the clamp 15 to slide along the rail 11. The tubing 50 is then pivoted about the bushing 16 to any desired inclination relative to the surface of the table 10, and finally, the tubing 50 is rotated about its own axis to swing the arm 61 to a desired position transversely of or longitudinally of the table.

To lock the screen at the desired position, the cap 31 is then rotated in a clockwise direction relative to FIG. 2. The cap 31 presses the disc 42 to the left relative to FIG. 4, and the pressure is transmitted through the spring washer 41 against the end of the plunger 36, to compress the coil spring 40 and to press the plunger against the face of the rail 11, to lock the screen against movement longitudinally relative to the operating table. Pressure is also applied through the bearings 34 and the washer 27 to one face of the split clamp 21, to press it against the face of the peripheral flange 17, to cause the clamp 21 frictionally to grip the stud 46, to hold the stud 46 against rotation about its own axis. The pressure that is applied to the split clamp 21 also forces the wedge 25 to move axially between the tapered ends 20 of the ring 18, to expand the ring 18 and to engage its circumferential surface against the annular inner face of the flange 17, to hold the split clamp 21 against rotation about the bushing 16 as a pivot pin.

To adjust the elevation of the screen above the surface of the operating table, the barrel 64 is rotated to permit the lower branch 60 of the arm 61 to be moved freely along its own axis. When the position of the arm 61 has been adjusted to the desired elevation, the barrel 64 is then

threaded back onto the upper end of the tubing 50 to compress the chuck 57 until it grips the branch 60 frictionally to hold it against axial movement.

The needle type thrust bearing 34 decreases the required locking force by reducing friction. The cushioning spring 41 prevents overloading of the plunger 36 and permits the use of loose tolerances in fabricating the parts.

There is thus provided a lock which supports an anesthetic screen and holds it in any adjusted position relative to the length of the table, at any pivotally adjusted inclination relative to the upper surface of the table, and at any adjusted rotated position to extend transversely or longitudinally of the table. An auxiliary quick acting lock is also provided to hold the screen at any desired elevation above the table. Both locks are easy to operate, and neither has any parts which project outwardly from the table so far as to be hazardous. The number of parts in the mechanism is relatively few and both locks are easy to operate, dependable, and neat in appearance.

The compound lock basically consists of a spring-loaded plunger, to hold the screen against longitudinal movement relative to the table; a ring and wedge type mechanism, to hold the screen against pivotal movement about an axis that extends transversely of the table; and a clamp that holds the screen at any adjusted position to which it is swung, to extend transversely or longitudinally of the table.

While the locking clamp described has particular utility for mounting an anesthetic screen on a surgical operating table, it can be used wherever it is desired to secure one rod to another or to a post or rail, and where the rod must be adjustable relative to its support.

While the invention has been described in connection with a single specific embodiment thereof, it will be understood that it is capable of further modification, and that this application is intended to cover any variations, uses, or adaptations of the invention following, in general, the principles of the invention and including such departures from the present disclosure as come within known or customary practice in the art to which the invention pertains and as may be applied to the essential features hereinbefore set forth, and as fall within the scope of the invention or the limits of the appended claims.

I claim:

1. In a locking device for holding a rod in an adjusted position on a rail, a member slidably mounted on said rail, said member having a threaded portion projecting therefrom, a cap threaded on said projecting portion for threaded movement lengthwise thereof, a split clamp having a pair of free arms and a recess between said arms in which a rod can be gripped upon movement of said arms toward each other, said arms having aligned transverse bores, said clamp being mounted on said projecting portion with said portion projecting through said bores and with said arms interposed between said member and said cap, whereby said clamp can grip said rod in said recess upon adjustment of the position of said cap in one direction on said threaded portion and can release said rod upon adjustment of the position of said cap in the opposite direction on said threaded portion, means for restraining said rod against lengthwise movement in said recess, means for holding said member against sliding movement on said rail, and other means for holding said clamp against pivotal movement on said member, said two last-named means being actuated by the adjustment of the position of said cap in said one direction.

2. In a locking device for holding a rod in an adjusted position on a rail, a member slidably mounted on said rail, an externally threaded bushing secured to said member and projecting outwardly of said rail, said bushing being formed with a bore that communicates at one of its ends with a surface of said rail, a plunger mounted in said bore for reciprocatory movement, spring means interposed between said plunger and said bushing constantly to urge said plunger in one direction, a cap threaded on

said bushing for threaded movement lengthwise thereof, said plunger being disposed for movement in one direction in said bore to engage said rail surface frictionally upon adjustment of the position of said cap in one direction and to disengage said rail surface upon adjustment of the position of said cap in the opposite direction, and a clamp mounted on said bushing and interposed between said member and said cap, said clamp being adapted to grip a rod upon adjustment of the position of said cap in said one direction and to release said rod upon adjustment of the position of said cap in the opposite direction.

3. The locking device of claim 2 in which said clamp is mounted for pivotal movement about said bushing, and including means actuated by the adjustment of the position of said cap in said one direction for holding said clamp against pivotal movement and for releasing said clamp upon adjustment of the position of said cap in the opposite direction.

4. In a locking device for holding a rod in an adjusted position on a rail, a member slidably mounted on said rail, an externally threaded bushing secured to said member and projecting outwardly of said rail, said bushing being formed with a bore that communicates at one of its ends with a surface of said rail, a plunger mounted in said bore for reciprocatory movement, spring means interposed between said plunger and said bushing constantly to urge said plunger in one direction, a cap threaded on said bushing for threaded movement lengthwise thereof, said plunger being disposed for movement in one direction in said bore to engage said rail surface frictionally upon adjustment of the position of said cap in one direction and to disengage said rail surface upon adjustment of the position of said cap in the opposite direction, a clamp mounted for pivotal movement about said bushing and interposed between said member and said cap, said clamp being adapted to grip a rod upon adjustment of the position of said cap in said one direction and to release said rod upon adjustment of the position of said cap in the opposite direction, said member being formed with a circular recess about said bushing, a split ring disposed about said bushing in said recess, means holding said split ring against rotary movement relative to said clamp, and means actuated upon adjustment of the position of said cap in said one direction to engage between the free ends of said ring to expand it, frictionally to engage said member to hold said clamp against pivotal movement relative to said bushing and said rail.

5. In a locking device for holding a rod in an adjusted position on a rail, a member slidably mounted on said rail, an externally threaded bushing secured to said member and projecting outwardly of said rail, said bushing being formed with a bore that communicates at one of its ends with a surface of said rail, a plunger mounted in said bore for reciprocatory movement, spring means interposed between said plunger and said bushing constantly to urge said plunger in one direction, a cap threaded on said bushing for threaded movement lengthwise thereof, said plunger being disposed for movement in one direction in said bore to engage said rail surface frictionally upon adjustment of the position of said cap in one direction to compress said spring means and to disengage said rail surface upon adjustment of the position of said cap in the opposite direction, a split clamp having a pair of free arms and a recess between said arms in which a rod can be gripped upon movement of said arms toward each other, said arms having aligned transverse bores, said clamp being mounted for pivotal movement about said bushing with said bushing projecting through said bores and with said arms interposed between said member and said cap, said member being formed with a circular recess about said bushing, a split ring engaged in said recess about said bushing, means folding said split ring against rotary movement relative to said clamp, and wedge means mounted for movement with said clamp and engaged between the free ends of said split ring, whereby upon adjustment of the position of said cap in said one direction the arms of said split clamp are moved together to cause the rod to be gripped in said recess and said wedge means is forced between the free ends of said ring to expand it frictionally to engage said member to hold said clamp against pivotal movement relative to said bushing and said rail.

6. The locking device of claim 5 including bearing means interposed between said cap and said split clamp to minimize frictional resistance to adjustment of the position of said cap by threaded movement on said bushing.

7. A locking device according to claim 5 including means for restraining said rod against lengthwise movement in said recess.

References Cited in the file of this patent

UNITED STATES PATENTS

1,028,932	Collins	June 11, 1912
1,190,502	Anderson	July 11, 1916
1,679,017	Athans	July 31, 1928
1,882,483	Cannon	Oct. 11, 1932
2,060,171	Burton	Nov. 10, 1936
2,180,480	Richardson	Nov. 21, 1939
2,310,276	Bilz	Feb. 9, 1943
2,801,142	Adams	July 30, 1957
2,932,867	Douglass	Apr. 19, 1960

FOREIGN PATENTS

121,867	Great Britain	Jan. 9, 1919
829,602	France	July 1, 1938
831,755	France	Sept. 14, 1938
76,245	Denmark	Aug. 17, 1953