

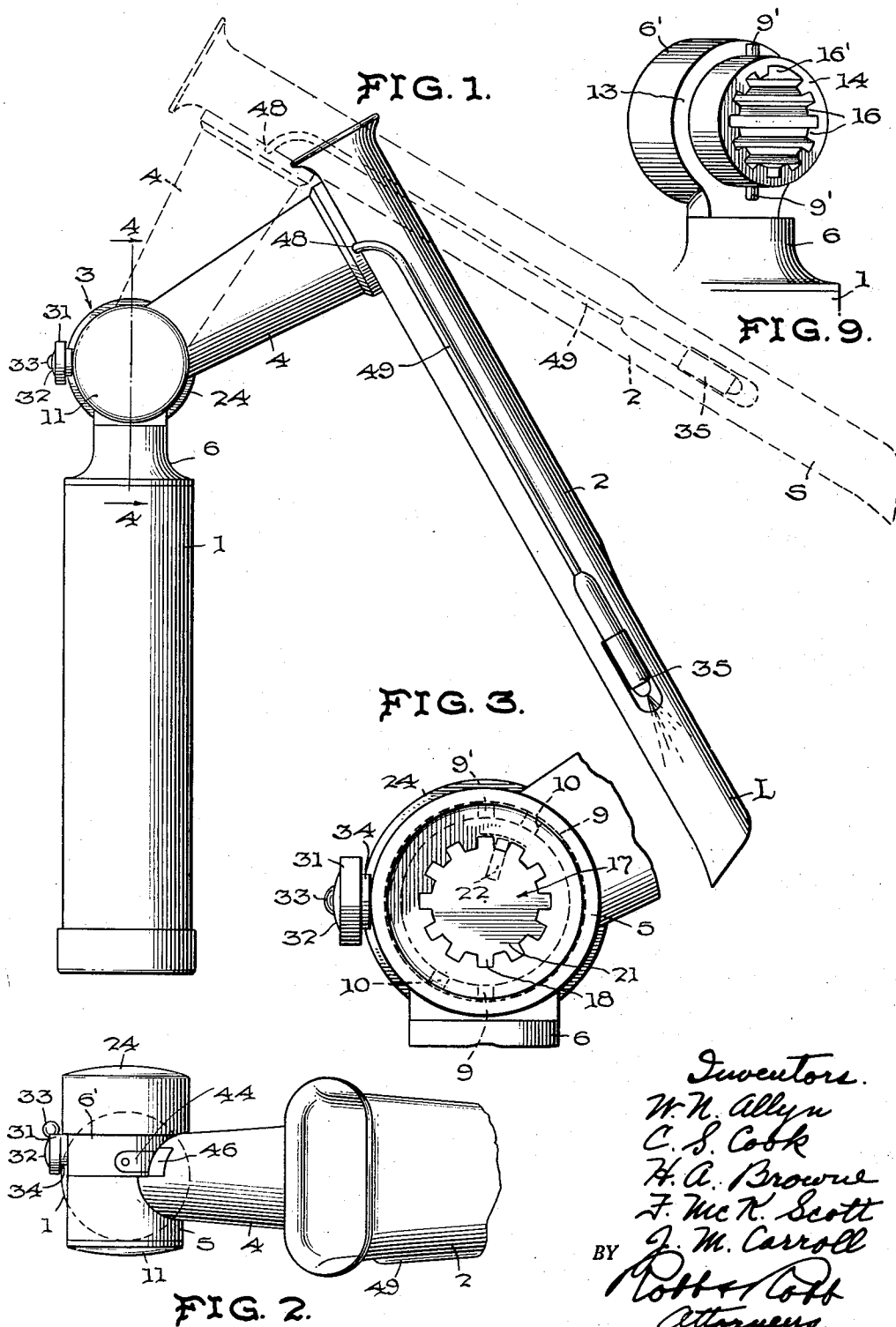
Aug. 18, 1953

W. N. ALLYN ET AL
FOLDING LARYNGOSCOPE AND ANGULARLY ADJUSTABLE
AND DETACHABLE JOINT THEREFOR

2,649,087

Filed Feb. 12, 1951

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

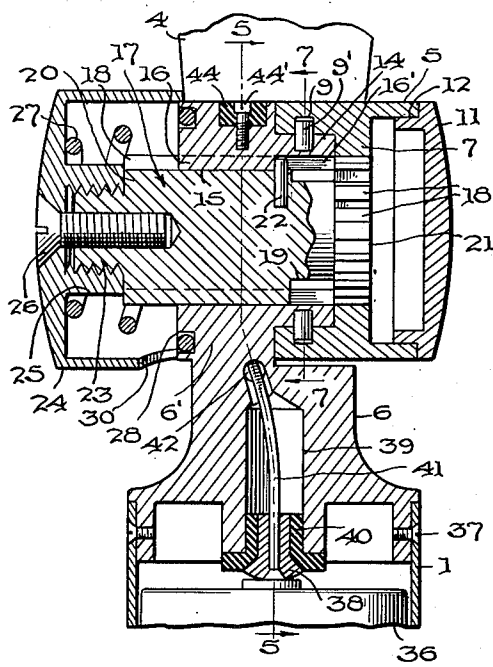


FIG. 4.

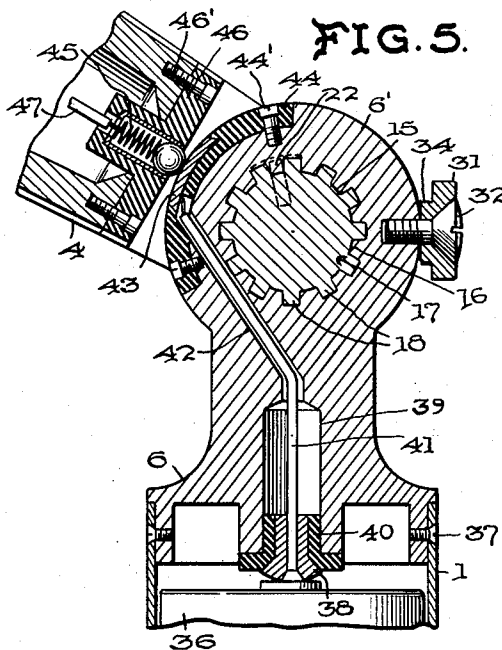


FIG. 5.

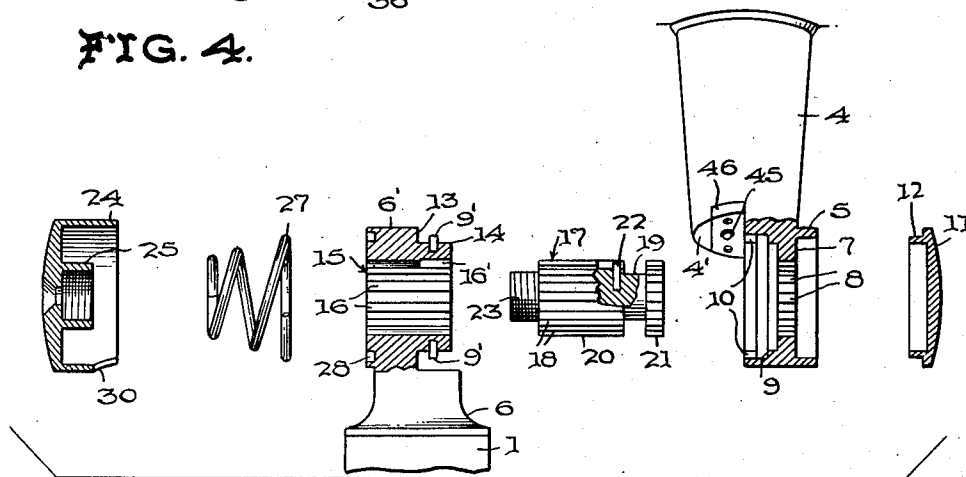


FIG. 6.

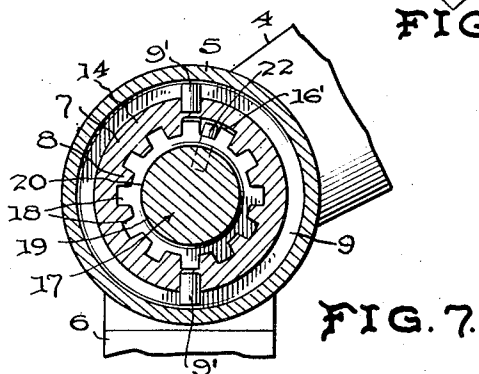


FIG. 7.

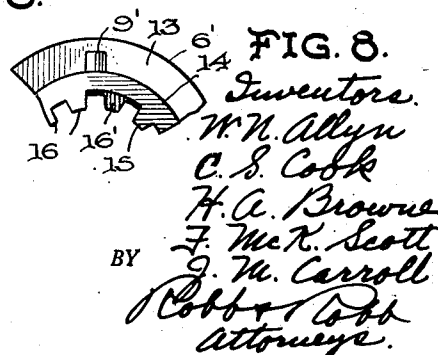


FIG. 8.

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FIG. 10.

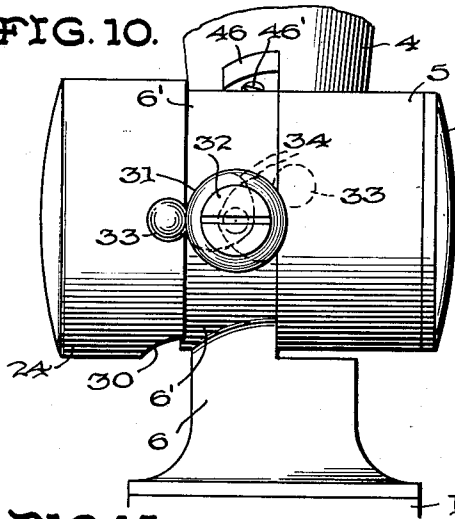


FIG. 11.

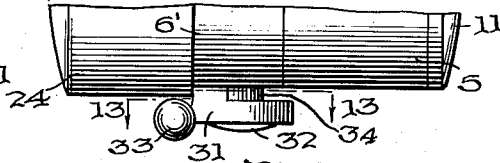


FIG. 12.

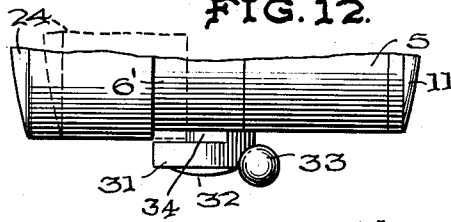


FIG. 13.

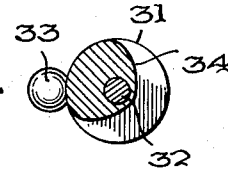


FIG. 15.

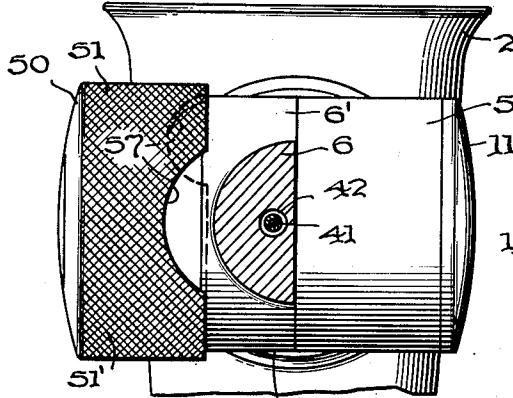


FIG. 14.

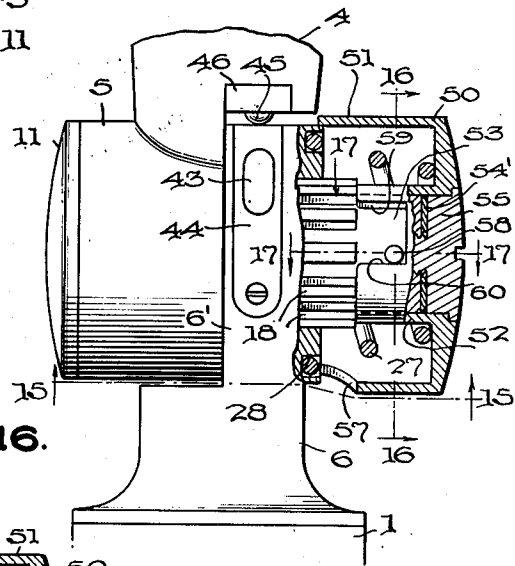


FIG. 16.

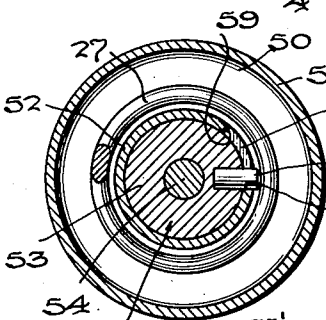


FIG. 17.

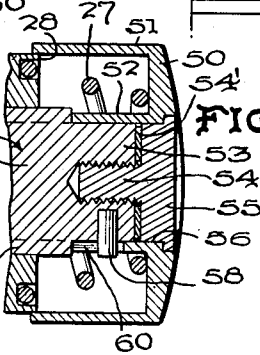
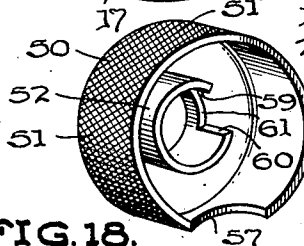


FIG. 18.



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UNITED STATES PATENT OFFICE

2,649,087

FOLDING LARYNGOSCOPE AND ANGULARLY ADJUSTABLE AND DETACHABLE JOINT THEREFOR

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Application February 12, 1951, Serial No. 210,598

23 Claims. (Cl. 128—6)

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The present invention relates to laryngoscopes, pharyngoscopes, and the like, and more particularly to an improved angularly adjustable, detachable joint connection between the blade and handle of such instruments.

Laryngeal and pharyngeal speculums are employed to depress the epiglottis at the base of the tongue, for illuminating the larynx, pharynx and adjacent areas for purposes of diagnostic examination, therapeutics, intra-nasal or intra-tracheal intubations, anaesthetization, or for any other purpose that requires access to and/or illumination of the posterior oral cavity, larynx, pharynx, or elsewhere, as necessary in each individual case.

It is desirable to have an instrument of this type that is capable of relative angular adjustment between the handle and blade, so that the pathologist, therapist or anaesthetist may assume a wide range of positions relative to the patient, as may be required in different cases.

It is also desirable that the blade of the instrument be foldable to a position closely adjacent to the handle so as to occupy a minimum of space for purposes of storage, and that the blade be readily detachable for purposes of rapid and thorough sterilization, and for purposes of interchange with blades of different sizes and/or shapes.

Accordingly, it is an object of the present invention to provide instruments of the aforementioned type with an improved joint connection between the handle and blade sections whereby the blade section may be more readily angularly adjusted relative to the handle section, and positively locked in any of a plurality of selective operative positions or in an inoperative folded position with the blade lying closely adjacent to the handle.

Another object is to provide an angularly adjustable joint connection which permits rapid and simple detachment of the handle and blade sections.

A further object is to provide an angularly adjustable, detachable joint connection between the handle and blade sections of a laryngoscope or the like, which includes means for automatically completing an electrical circuit between the light bulb, usually carried by the blade, and the batteries or other power supplying means carried by the handle.

Still another object is to provide means for positively locking the handle and blade sections against inadvertent angular movement when the instrument is in use.

A still further object is to provide a joint connection for laryngoscopes, pharyngoscopes and the like which is extremely simple and easy to

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operate, relatively inexpensive to manufacture, and extremely strong and durable.

Other objects and advantages will hereinafter become apparent and the novel features of the invention defined in the appended claims.

In the drawings:

Figure 1 is a view in side elevation of a laryngoscope embodying the improved hinge joint connection of this invention, with the blade shown in full lines in one of its operative positions, and also showing in dotted lines the relative positions of the handle and blade sections as assumed when they are to be laterally separated or detached from each other;

Figure 2 is a view in top plan of the laryngoscope of Figure 1, with the free end of the blade broken away;

Figure 3 is an enlarged fragmentary view in side elevation of the hinge joint connection with the closure cap removed;

Figure 4 is an enlarged view in vertical section, as taken on the line 4—4 of Figure 1;

Figure 5 is a view in vertical section, as taken on the line 5—5 of Figure 4;

Figure 6 is an exploded view of the hinge joint connection, with certain of the parts broken away and shown in section;

Figure 7 is a view in vertical section, as taken on the line 7—7 of Figure 4;

Figure 8 is a fragmentary view in elevation of a portion of the joint member which is carried by the handle, with the splined pin or plunger omitted from this view;

Figure 9 is a view in perspective of the joint member which is carried by the handle, and showing a fragmentary portion of the handle;

Figure 10 is an enlarged fragmentary view in elevation of the hinge joint showing one form of the joint safety lock, the safety lock being shown in full lines in its locking position, and in broken lines in its unlocking position;

Figure 11 is an enlarged fragmentary detail view in top plan, showing the safety lock of Figure 10 in locking position;

Figure 12 is an enlarged fragmentary detail view in top plan, showing the safety lock of Figure 10 in unlocking position, and showing in broken lines the depressed position of the actuator button;

Figure 13 is a sectional detail view of the safety lock, as taken on the line 13—13 of Figure 11;

Figure 14 is an enlarged fragmentary view in elevation of a modified form of hinge joint, with a portion broken away to show the details of construction of a modified actuator button which serves also as the safety lock upon rotation thereof;

Figure 15 is a view in horizontal section, as

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taken on the plane of the line 15—15 of Figure 14, showing the actuator button in full lines in its safety unlocking position, and showing in broken lines the safety locking position assumed by the actuator button upon rotation thereof;

Figure 16 is a vertical sectional view, as taken on the line 16—16 of Figure 14;

Figure 17 is a view in horizontal section, as taken on the line 17—17 of Figure 14; and

Figure 18 is a view in perspective of the actuator button shown in Figures 14 through 17, and more particularly showing the interior form thereof, but on a slightly reduced scale.

Like reference characters designate corresponding parts in the several figures of the drawings, wherein the instrument, for purposes of illustration, has the form of a laryngoscope, as seen in Figure 1, and comprises a handle 1 and a blade 2 which are interlockingly, detachably and adjustably interconnected by means of a novel joint construction 3 to which the present invention primarily relates.

The co-pending application of Cook and Becker, Serial No. 169,918, filed June 23, 1950, discloses an instrument of this general type, and the present invention constitutes a substantial improvement over the joint construction of that application, since the present joint is more simple and inexpensive to manufacture, attains greater ease of operation, and is much stronger and more durable.

The blade of the instrument may have any desired form, that form shown being purely illustrative, and is suitably secured to a frusto-conical head member 4. The end of the head member 4 remote from the blade 2 forms, as at 5, one of a pair of complementary, relatively rotatable joint members, and the head member 4 and the blade 2 together constitute a detachable blade unit or section.

The handle 1 of the instrument is connected to a base member 6. The free end of the base 6 forms, as at 6', a joint portion which is complementary to the member 5, the handle 1 and base member 6' forming a handle unit or section.

The portion 5 of the head 4 comprises an enlarged cylindrical joint member having its central axis disposed at a right angle to the axis of the head member 4, and is laterally offset from the latter axis so as to have its inner face substantially flush with the median plane of the head 4. Internally of the cylindrical joint member 5 is a radially inwardly extended locking ring 7 preferably formed integral therewith, the locking ring 7 being provided with circumferentially spaced teeth or splines 8. The inner surface of the cylinder 5 inwardly of the locking ring 7 is provided with an annular groove 9 and a pair of diametrically opposed communicating slots 10 which extend longitudinally inward from the groove 9 to define a so-called bayonet slot. The outer open end of the cylindrical enlargement 5 is adapted to receive a closure or cap 11 having a collar 12 which may be suitably positioned within the member 5, as by means of a tight friction fit or the like (see Figure 4).

The mating or complementary member 6' on the base portion 6 of the handle unit is also in the form of a cylindrical enlargement which is laterally offset so as to form a shoulder 13 having its inner face substantially flush with the median plane of the base 6, said shoulder being adapted to butt up against the inner face of the cylinder 5 on assembly of the joint. The cylindrical member 6' has a cylindrical projection 14 of reduced

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size adapted to extend into the member 5, as best seen in Figure 4, into abutting engagement with the locking ring 7, the projection 14 being provided with a pair of diametrically opposite, outwardly extending pins 9' which are adapted to pass through the slots 10 in the inner surface of the member 5, and into registry with the annular groove 9 so that the two complementary members 5, 6' may be interlockingly engaged with each other upon relative rotation thereof, or relative angular movement between the handle 1 and the blade 2 to any position other than that when the pins 9', 9' are in registry with the slots 10, 10. A common opening or bore 15 extends through the cylindrical members 6' and 14, and the inner faces of these members are provided with longitudinally extended teeth or splines 16, one of the splines 16 being cut back, as at 16', for a predetermined distance (see Figure 6).

A reciprocable plunger or pin 17 is adapted to be shiftably positioned within the opening 15 and is provided with circumferentially spaced, longitudinally extended splines or teeth 18 for cooperative interengagement with the splines 16 in the cylindrical members 6' and 14 and with the splines 8 in the locking ring 7. Adjacent to one end thereof, the plunger pin 17 is reduced in diameter, as at 19, thus leaving a pair of axially spaced splined sections 20, 21 thereon, and an intermediate annular recess between these splined sections 20, 21, for a purpose that will be more fully explained hereinafter in the description of operation. Between two of the teeth 18 on the splined section 20 of the plunger pin 17 is a radially outwardly extended pin or stop 22, which in assembly is adapted to be positioned in the space 16' left by cutting back one of the splines 16 on the inner face of the cylindrical member 14.

The left-hand end of the plunger pin 17, in the embodiment shown in Figures 1 to 13, and as best seen in Figures 4 and 6, is provided with a reduced screw-threaded neck 23 on which is adjustably attached a hollow plunger button or actuator 24, the button 24 having an internally threaded centrally disposed projection 25 for this purpose. The button or cap 24 may be locked in adjusted position on the neck 23 by means of a locking screw 26 (see Figure 4). A tapered coil spring 27 is interposed between the cylindrical joint member 6' and the cap 24 for urging the cap away from the joint member 6', the small end of the coil spring 27 being centered about the projection 25 and disposed in abutting relation to the inner surface of the cap 24, and the large end of the coil spring 27 being seated in an annular groove 28 in the outer face of the cylindrical joint member 6' opposed to the cap 24.

As best seen in Figure 4, the spring 27 urges the plunger or pin 17 to the left until the stop pin 22 between two of the teeth 18 on the splined section 20 of plunger 17 butts up against the spline 16 which has been cut back at 16'. The relative position of the spline section 21 with respect to the locking ring 7 when the plunger 17 has reached its limit of movement to the left is such that the splines 8 and 21 on the respective parts are squarely interengaged, thus locking the head 4 and the base 6 against relative angular movement and in a selective position of adjustment. The angular relationship between the head 4 and the base 6 may be readily changed, however, by pushing the plunger button or actuator 24 to the right, with consequent shifting of the plunger 17 to the right

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until the spline section 21 completely disengages from the locking ring 7 and the reduced section 19 of the plunger 17 is located within the locking ring 7, whereupon the complementary joint members are free to rotate relative to each other. In order to allow the plunger 17 to be shifted a sufficient distance to the right when it is desired to adjust the angular relation of the instrument, the cap or plunger button 24 is provided with a chordal recess 30 so that the lower portion of the cap 24 will not abut against the adjacent portion of the base member 6.

In use, the therapist or other operator often grasps the instrument in the area of the joint 3, and thus may inadvertently depress the plunger 17 to such an extent that the angular adjustment of the instrument may be changed. This is very undesirable, particularly having in view the substantial force—as much as 150 pounds, that the operator often must apply to the instrument. Therefore, a safety lock is preferably provided to positively lock the plunger 17 against inadvertent shifting movement, and in one embodiment, as seen in Figures 1 to 13, this safety lock comprises a pivoted cam lock, designated generally at 31, suitably secured to the outer peripheral wall of the cylindrical joint member 6' by means of a screw 32 or the like. The cam lock 31 includes an operating knob or projection 33, and its inner face is cut back, as at 34. As best seen in Figures 10 to 12, when the cam lock 31 is in the position shown in full lines in Figures 10 and 11, it engages the plunger button 24 and prevents shifting movement thereof until the cut back portion 34 is turned around to face the plunger button 24, as seen in broken lines in Figure 10, and in full lines in Figure 12, at which time the plunger button 24 is rendered free for movement towards the joint 3, as shown in broken lines in Figure 12.

Figures 14 to 18 show another embodiment of the safety lock feature of this invention, wherein the actuator button is adapted to be rotatably shifted relative to the joint so as to cause the annular skirt thereof to butt up against the base portion 6 of the handle section and thereby prevent inadvertent depression of the actuator button. In this form, the connection between the actuator button and the plunger pin is modified slightly from that form shown in Figures 1 to 13, but the joint construction is identical. Therefore, the joint parts in Figures 14 to 18 have been given corresponding reference characters, and the modified actuator button and safety lock means have been designated by new reference characters.

Referring now to Figures 14 to 18, it is seen that the actuator button 50 includes an annular skirt 51 and an internal boss or projection 52 which is freely rotatably mounted on the reduced end 53 of the plunger pin 17 and is secured thereto by means of a screw 54 having a cylindrical head portion 55 which is received in a complementary recess 56 in the actuator 50, thus allowing the actuator 50 to be rotated relative to the plunger 17. A washer 54' is preferably interposed between the cylindrical head 55 of the screw 54 and the portion 53 of the plunger pin 17, this washer acting to bind the screw 54 against the pin 17 so as to prevent its rotation with the actuator 50, that otherwise would loosen the screw.

When the joint is locked by the spline section 21 on the pin 17 and the splined locking ring 7 in a selected position of angular adjustment, the plunger 17 may be shifted out of joint-lock-

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ing position by depressing the actuator button 50, the chordal recess 57 in the skirt 51 permitting the actuator to move past the adjacent surface of the base portion 6. However, due to the fact that this actuator 50 is rotatable, it may be turned to such a position that the skirt 51 thereof abuts against the adjacent portion of the base 6, as is represented by the broken lines in Figure 15, thus prohibiting depression of the actuator. The outer peripheral surface of the skirt 51 is preferably roughened or knurled, as at 51', to permit it to be readily and easily turned by the operator's fingers without slippage.

Means cooperative between the portion 53 of the plunger pin 17 and the boss 52 is provided to limit the extent of rotative movement of the actuator button 50, this cooperative means preferably comprising a radially extended stop pin 58 carried by the reduced portion 53 of the plunger 17 and engageable with the opposed faces 59, 60 of the boss 52 at opposite ends of a circumferential recess 61 in the boss 52 into which the stop pin 58 projects.

The relationship of the stop pin 58 and the recess 61 is such that rotation of the actuator button 50 in a counterclockwise direction, as seen in Figure 16, causes the face 60 of the boss 52 at the end of the slot 61 to engage the stop pin 58, and in this position the actuator 50 is free to be laterally or axially shifted to unlock the joint 3 by virtue of the chordal recess 57 in the skirt 51 of the actuator 50 being directly registered with the base portion 6. Upon reverse rotation of the actuator 50, the face 59 of the boss 52 which is at the opposite end of the recess 61 from the face 60 will engage the stop pin 58, and the actuator 50 will be so positioned that the skirt 51 thereof will abut against the base portion 6, as shown in broken lines in Figure 15, thus preventing lateral shifting movement of the actuator 50 in a direction to unlock the joint 3.

The instrument is also preferably provided with suitable means for energizing a light bulb 35 carried adjacent to the outer end of the blade 2, when the instrument is in at least one of its operative positions, this position being designated L in Figure 1, and for deenergizing the light when the instrument is in its inoperative folded position or in its separable position S shown in broken lines, or any other position or positions within its range of adjustment, but it must be understood that the circuit making instrumentalities may be readily modified to effect illumination of the bulb 35 in any or all of the various angular positions assumed by the instrument without departing from the spirit of this invention.

The means for effecting the energization or deenergization of the light bulb 35 includes a suitable number of flashlight batteries 36 carried in the handle 1, as is customary in the art, the handle being suitably attached to and closed by the base member 6, as by means of screws 37. Electrical contact is made with the batteries 36 by a contact 38 suitably positioned in a vertical bore 39 in the base 6 and insulated therefrom as at 40. An insulated conductor 41 extends from the contact 38 through the bore 39 and thence through a passage 42 extending through the cylindrical joint member 6', and is connected to a contact shoe 43 which is mounted in an insulating block 44 which is secured in an arcuate groove in the periphery of the cylindrical member 6' by means of screws 44' or the like.

Adapted for cooperation with the contact shoe 43 is a spring-loaded ball contact assembly 45

carried in an insulating block 46 which is fixed in a groove in the flat face 4' of the head 4, as by means of screws 46' or the like. Connected to the ball contact assembly 45, and passing through the hollow head 4 is a second insulated conductor 47, which is passed to the exterior of the head member 4 adjacent the point of juncture of the head with the blade 2 (see Figure 1) as at 48, and then extends through a small tube 49 extending along the outer side of the blade 2 to the light 35. Ground contact for the other side of the circuit is made through the metal parts of the instrument, as is conventional in self-contained and portable illuminated devices.

As best seen in Figure 5, the ball contact assembly 45, the contact shoe 43, and their respective insulating blocks are so located and arranged in the head 4 and the cylindrical joint member 6', respectively, of the assembled instrument that they do not interfere in any way with the lateral separation of the joint 3 when the blade 2 is shifted to the position designated S in Figure 1, after depressing the actuator button 24 or 50 in the manner hereinbefore described and corresponding to the operation for permitting any angular adjustment of the blade relative to the handle.

While the instrument of this invention has been described and shown as carrying batteries in the handle, it is within the purview thereof to have means for plugging in to a house current supply in lieu thereof.

An instrument made in accordance with this invention will normally be stored in a completely folded position, i. e., with the blade 2 swung to a position closely adjacent the handle 1, so as to occupy a minimum of storage space. When the instrument is to be utilized, it is merely necessary for the operator to press the actuator button 24 or 50, as the case may be, inwardly, thus shifting the plunger pin 17 to the right, as seen in Figure 4, thereby disengaging the splines 18 on the splined section 21 from the splines 8 in the locking ring 7, thus rendering the blade and handle unit free for relative angular movement. Then the blade is swung away from the handle, the ball contact 45 riding up over the insulating block 44 into engagement with the contact shoe 43, and effecting energization of the lamp 35. Upon release of the plunger button 24 or 50, the splined section 21 will be urged back into engagement with the locking ring 7 by the spring 27, the stop pin 22 limiting this movement and assuring proper registration of these splined members. The joint is accordingly strongly and rigidly locked in the position of angular adjustment designated L in Figure 1, or in any other selective position, according to the number and spacing of the splines 18 and 8. The operator may then rotate the safety lock 31 to the position shown in Figures 1, 2 and 3, or he may rotate the actuator 50 to the position shown in broken lines in Figure 15, to obviate inadvertent depression of the actuator button 24 or 50 during use of the instrument.

The degree of angular adjustment attainable by the instrument of this invention is limited only by the size and number of the complementary splines 8, 18, and the instrument may be locked in any position intermediate the fully folded, storing position to the extreme limit of its relative movement in the opposite direction, and, by the same token, the electric contact shoe 43 may be, if desired, extending to such an extent that the lamp 35 will be energized in all

of these operative positions of adjustment with the exception of the fully folded position. Suitable stops may be provided, if desired, to limit the extent of angular adjustment in either or both directions without departing from the spirit of this invention, as by placing suitable stops or lugs in the desired position in the annular groove 9 in the inner periphery of the cylindrical joint member 5.

When it is desirable to completely disengage the blade unit from the handle unit for purposes of sterilization or for changing to other blades, the cam lock 31 is turned so that the cut back portion 34 thereof is opposed to the plunger button 24, or the actuator 50 is rotated to its position with the chordal recess 57 in register with the base portion 6, and the same procedure as has been hereinbefore described is followed, except that the blade unit is swung to the position designated S, at which position the opposed pins 9' in the annular groove 9 are in alignment with the slots 10 and the blade and handle units may be laterally separated. In all other positions, however, the joint is held against lateral separation by the pins 9' being confined in the annular groove 9, the substantially close fit between the pins 9' and the groove 9 preventing any lateral play between the joint parts.

While the instrument shown in the accompanying drawings is adapted to be separated when it is in the position S, it should be understood that the separable position may be varied as desired, by merely varying the respective angular positions of the slots 10 in the inner periphery of the member 5 and the pins 9' on the cylindrical portion 14 of the member 6'.

It is to be understood that the term "laryngoscope" as used in the foregoing description and in the appended claims, is intended to be construed in a broad sense as embracing pharyngoscopes and various other instruments of an equivalent type wherein a blade or other operative part is to be adjusted angularly relative to a handle member or other comparable support.

While the specific details have been herein shown and described, the invention is not confined thereto, as changes and alterations may be made without departing from the spirit thereof as defined in the appended claims.

What is claimed is:

1. A laryngoscope, comprising a handle section, a blade section, and means hingedly interconnecting the sections including complementary relatively rotatable members for enabling said blade section to be angularly adjusted relative to said handle section, shiftable means carried by the first-mentioned means for positively locking said sections in selective adjusted angular positions, and means carried by said shiftable means and engageable with a relatively fixed abutting part of one of said rotatable members for releasably locking said shiftable means in locking relation with said sections to prevent the same from being shifted in one direction.

2. A laryngoscope, comprising a handle section, a blade section, and means hingedly interconnecting the sections including complementary relatively rotatable members for enabling said blade section to be angularly adjusted relative to said handle section, shiftable means carried by the first-mentioned means for positively locking said sections in selective adjusted angular positions, means carried by said shiftable means and engageable with a relatively fixed abutting part

of one of said rotatable members for selectively locking said shiftable means in locking relation with said sections to prevent the same from being shifted in one direction, and cooperatively interengaged parts in said hinge means, one of said parts being provided with means disengageable from the other part for enabling lateral separation of the sections aforesaid when the sections are in one predetermined position relative to each other while interlocking said sections together in every other relative position.

3. A laryngoscope, comprising a handle section, a blade section, and means hingedly interconnecting the sections including complemental relatively rotatable members for enabling said blade section to be angularly adjusted relative to said handle section, means within said complemental members normally interlocking the complemental members in selective adjusted angular positions but being shiftable out of interlocking relation therewith for permitting angular adjustment thereof, and means carried by said shiftable means and engageable with a relatively fixed abutting part of one of said rotatable members for selectively locking said shiftable means in interlocking relation with said complemental members to prevent the same from being shifted in one direction.

4. A laryngoscope, comprising a handle section, a blade section and means hingedly interconnecting the sections including complemental relatively rotatable members for enabling said blade section to be angularly adjusted relative to said handle section, means within said complemental members normally interlocking said complemental members in selective adjusted positions but being shiftable out of interlocking relation therewith for permitting angular adjustment thereof, actuator means for said shiftable means, means for enabling lateral separation of the sections aforesaid when the sections are in one predetermined position relative to each other while interlocking said sections against lateral separation in every other relative position, and a cam stop releasably engageable with said actuator means to positively lock said shiftable means in its normal position.

5. A laryngoscope, comprising a handle section, a blade section, and means hingedly and detachably interconnecting the sections including complemental relatively rotatable members for enabling said blade section to be angularly adjusted relative to said handle section, shiftable means for positively locking said complemental members in selective adjusted angular positions, cooperative abutment means on said shiftable means and one of said rotatable members for releasably locking said shiftable means in locking relation with said complemental members to prevent shifting movement of the same in one direction, a lamp carried by said blade section, electric current supplying means carried by said handle section, and means in said complemental members for completing an electrical circuit between said lamp and said current supplying means when the sections are in at least one position of angular adjustment.

6. A laryngoscope as defined in claim 5, wherein the means for releasably locking the shiftable means comprises a cam stop.

7. A laryngoscope as defined in claim 5, wherein the shiftable means includes an actuator button, and the means for releasably locking the shiftable means comprises a cam stop carried by

one of the complemental members and engageable with said actuator button.

8. A laryngoscope, comprising a blade section, a handle section, and a hinge joint connecting said sections together, said hinge joint including complemental relatively rotatable members enabling said blade section to be angularly adjusted relative to said handle section, each of said complemental members being provided with internal splines, and a splined pin shiftable into and out of cooperative relation with the splines in one of the complemental members for selectively and positively locking said blade section in selective adjusted positions and for unlocking said blade section to permit angular adjustment thereof.

9. A laryngoscope, comprising a blade section, a handle section, and a hinge joint connecting said sections together, said hinge joint including complemental relatively rotatable members enabling said blade section to be angularly adjusted relative to said handle section, each of said complemental members being provided with internal splines, a shiftable splined pin cooperative with the splines in the complemental members for selectively and positively locking said blade section in selective adjusted positions and for unlocking said blade section to permit angular adjustment thereof, and means in the hinge joint enabling lateral separation of the handle and blade sections aforesaid when the sections are in one predetermined position relative to each other, while interlocking the sections together in every other relative position therebetween.

10. A laryngoscope as defined in claim 9, wherein one of said complemental members is provided with an annular locking ring having internal splines formed therein, and the shiftable splined pin comprises a pair of axially spaced splined sections, one of said splined sections being engageable with and disengageable from said locking ring and the other of said splined sections being slidably engaged with the splines in the other of said complemental members.

11. A laryngoscope as defined in claim 9, wherein the shiftable splined pin and one of the complemental members are provided with cooperative means for limiting shifting movement of the pin into cooperative locking relation with the splines in the complemental members.

12. A laryngoscope as defined in claim 9, wherein the shiftable splined pin comprises a pair of axially spaced splined sections, one of said splined sections being engageable with and disengageable from the splines in one of said complemental members, the other of said splined sections being slidably engaged with the splines in the other of said complemental members, a stop pin carried by the last-mentioned splined section between two adjacent splines thereon, said stop pin being abuttingly engageable with one of the splines in the last-mentioned complemental member for limiting shifting movement of the other of said splined sections into engagement with the splines in the first-mentioned complemental member.

13. A laryngoscope as defined in claim 9, wherein the shiftable splined pin is provided with an actuator for shifting the same out of cooperative relation with the splines in one of the complemental members, and resilient means interposed between said actuator and one of the complemental members for normally urging said pin into cooperative relation with the splines in said one of the complemental members.

14. A laryngoscope, comprising a blade section,

a handle section, and a hinge joint connecting said sections together, said hinge joint including complemental relatively rotatable members enabling said blade section to be angularly adjusted relative to said handle section, a shiftable plunger extending through said complemental members, mating splines on said plunger and said complemental members respectively, the splines on said plunger being slidably engaged with the splines in one of said complemental members and being shiftable into and out of engagement with the splines of the other of said complemental members for selectively and positively locking said blade section in selective adjusted positions and for unlocking said sections to permit angular adjustment thereof, an actuator carried by said plunger for shifting the same out of engagement with the splines in one of the complemental members, resilient means interposed between said actuator and one of the complemental members for normally urging said plunger into engagement with the splines in said complemental members, and means for releasably locking said actuator when the blade is locked in a selected adjusted position.

15. A laryngoscope as defined in claim 14, wherein the means for releasably locking said actuator comprises a cam stop carried by one of said complemental members and engageable with said actuator.

16. An angularly adjustable and separable hinge joint of the class described, comprising a pair of relatively rotatable complemental members having an axial opening therethrough, splines spaced about the periphery of said opening in each of said complemental members, means for enabling selective angular adjustment of said complemental members and for positively locking said complemental members in adjusted position including a pin shiftable mounted in said opening and having splines thereon complementary to the splines in said complemental members for selective engagement with and disengagement from the internal splines in one of said complemental members and for sliding engagement with the splines in the other of said complemental members, and means cooperative with said complemental members for enabling lateral separation thereof when they are in one predetermined relative angular position and interlocking said complemental members together in every other relative angular position.

17. An angularly adjustable and separable hinge joint as defined in claim 16, wherein the splines on the shiftable pin comprise axially spaced splined sections, one of said splined sections being engageable with and disengageable from the complementary splines in one of said complemental members, and the other of said splined sections being slidable in the complementary splines of the other of said complemental members.

18. An angularly adjustable and separable hinge joint as defined in claim 16, in combination with means carried by one of the complemental members for selectively and positively locking the shiftable pin at the limit of its movement effecting engagement of the splines thereon with the splines in both of the complemental members.

19. An instrument of the class described, comprising a handle section and a blade section, said sections respectively including a base portion and a head portion, means hingedly interconnecting said portions including complemental, relatively rotatable members for enabling said blade section

to be angularly adjusted relative to said handle section, laterally shiftable means cooperatively disposed in said relatively rotatable members for positively locking said sections in selective adjusted positions, and means releasably locking said shiftable means in locking relation with said relatively rotatable members, the last-mentioned means comprising an actuator rotatably mounted on said shiftable means, said actuator having means enabling the same to be laterally shifted in one of its rotative positions, and also having means restraining the same against lateral shifting thereof in every other rotative position.

20. An instrument as defined in claim 19, wherein the shiftable means and the actuator are provided with cooperatively engageable means for limiting rotation of said actuator in one direction to said laterally shiftable position and for limiting rotation thereof in the opposite direction to said restrained position.

21. An instrument as defined in claim 19, wherein the actuator includes an annular skirt which is laterally shiftable into surrounding relation about one of said complemental relatively rotatable members, said skirt having a chordal recess therein for enabling the actuator to be laterally shifted when in its laterally shiftable position, and said skirt abutting against the base portion aforesaid in every other rotative position thereof for locking said shiftable means as aforesaid.

22. An instrument of the class described, comprising a handle section and a blade section respectively including a base portion and a head portion, means hingedly interconnecting said portions including relatively rotatable members for enabling said blade section to be angularly adjusted relative to said handle section, a shiftable plunger cooperative with said members for releasably locking said sections in selective adjusted positions, an actuator rotatably carried by said plunger, a limit stop carried by said plunger and engageable with said actuator for limiting rotation thereof in opposite directions, and a skirt on said actuator engageable with said base portion when said actuator is at the limit of its rotative movement in one direction for preventing shifting of the plunger aforesaid, said skirt having a recess therein for enabling said actuator and plunger to be laterally shifted when the actuator is at the limit of its rotative movement in the opposite direction.

23. An instrument of the class described, comprising a handle unit and a blade unit, means hingedly and releasably interconnecting said units so as to enable the same to be angularly adjusted relative to each other and to be detached from each other, at will, said means including a shiftable pin, safety locking means for preventing shifting of said pin and consequently for preventing angular adjustment and detachment of said units, and common actuator means for shifting said pin and for controlling said safety locking means.

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