April 3, 1928. 1,665,156

A. W. ALBERS

SWITCH

Filed March 5, 1925 3 Sheets-Sheet 1

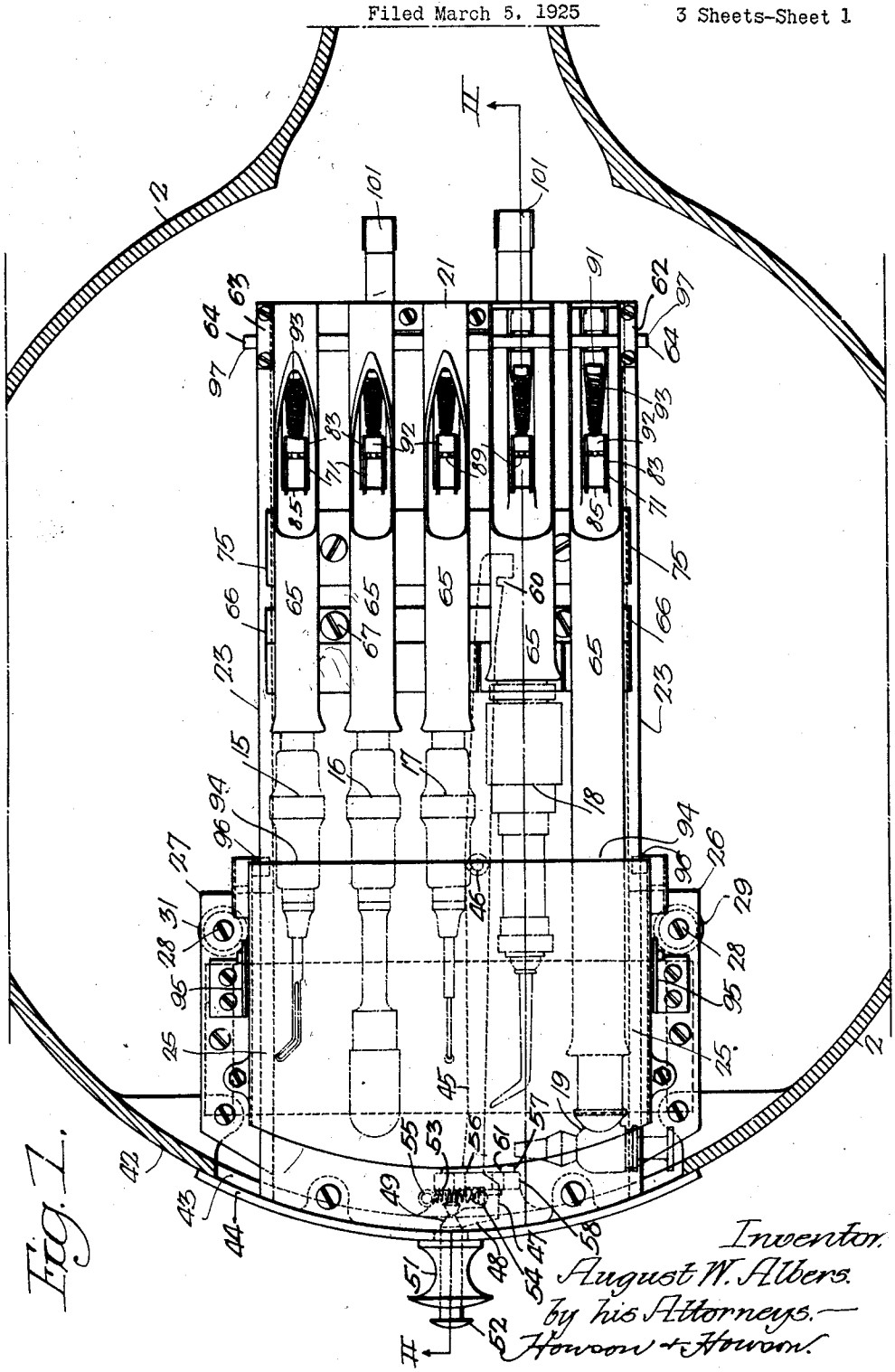


Fig. 1.

Inventor.
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SWITCH

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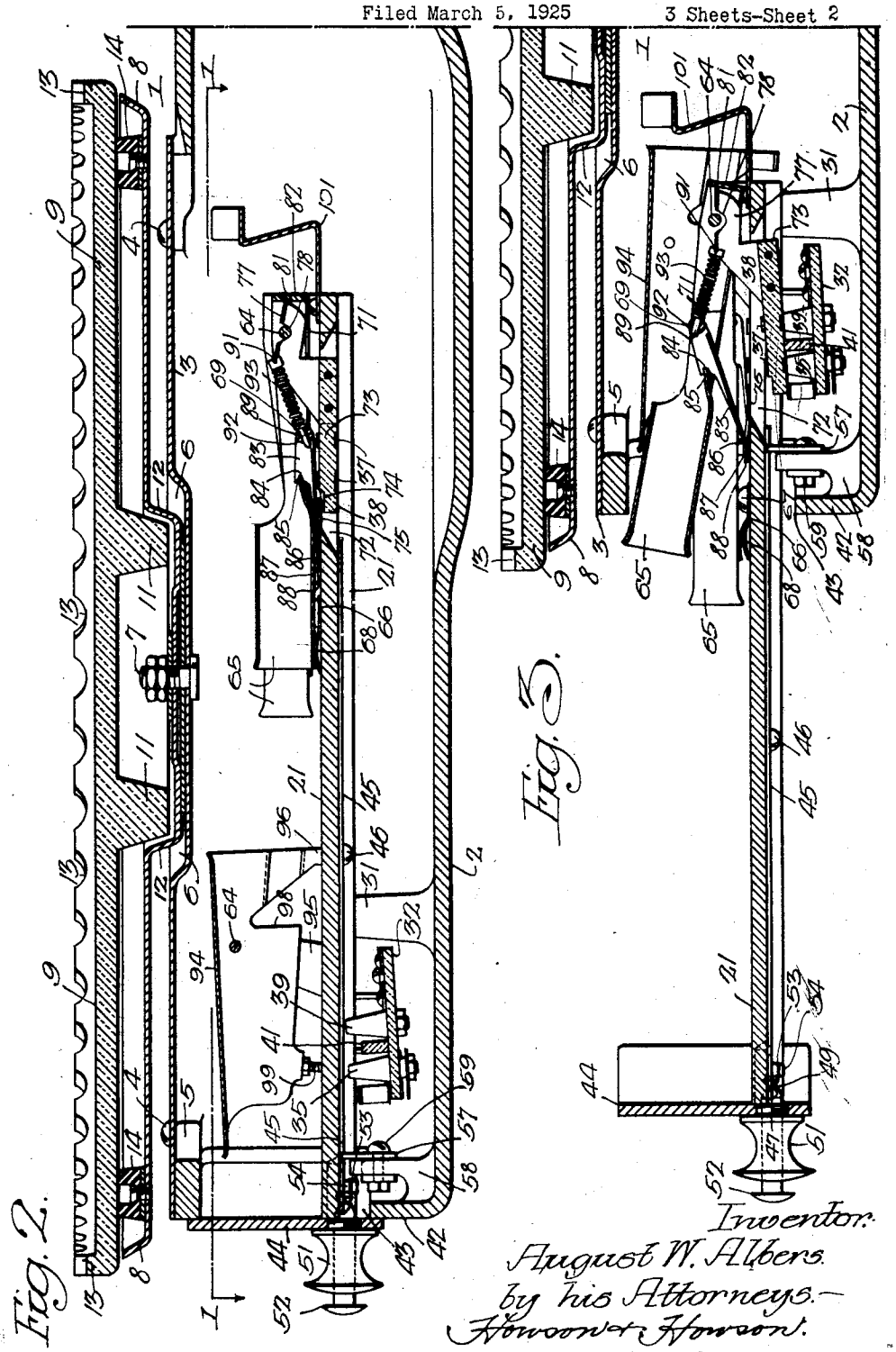


Fig. 2.

Fig. 3.

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SWITCH

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Fig. 5

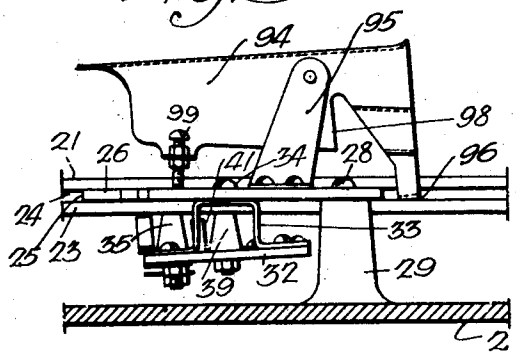


Fig. 8.

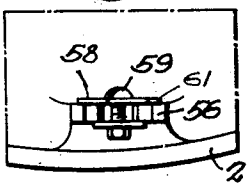


Fig. 4.

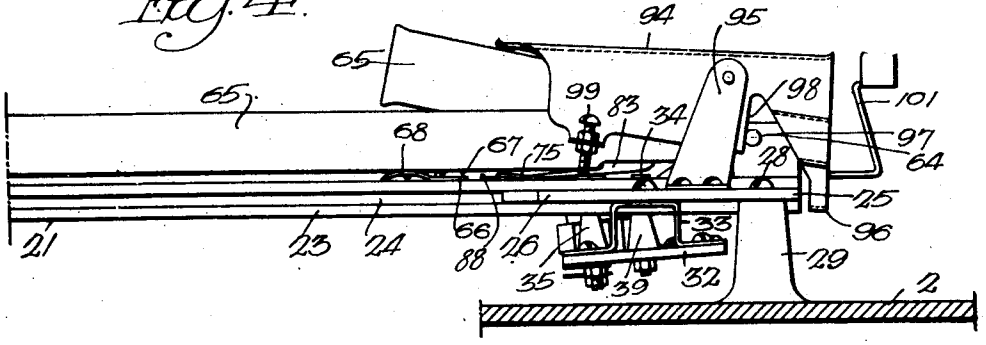


Fig. 7.

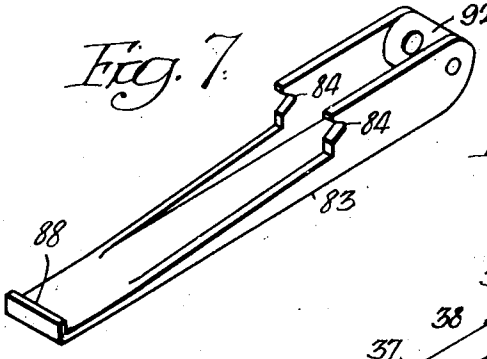
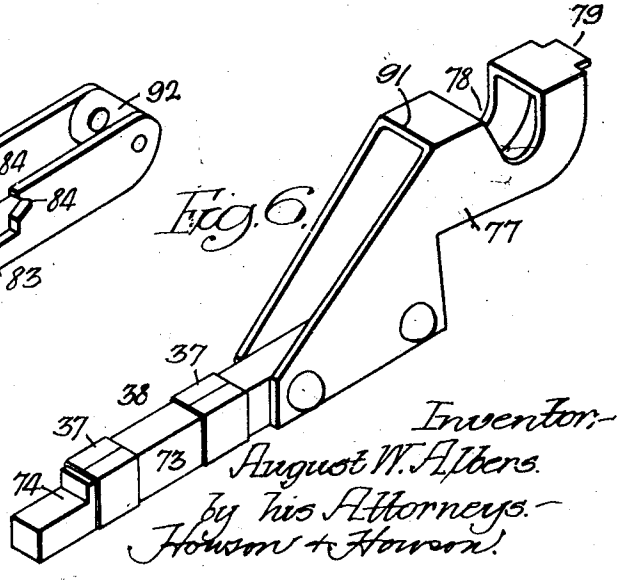


Fig. 6.



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Patented Apr. 3, 1928. 1,665,156

UNITED STATES PATENT OFFICE.

AUGUST W. ALBERS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO ELECTRO DENTAL MANUFACTURING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

SWITCH.

Application filed March 5, 1925. Serial No. 13,280.

My invention relates to dental apparatus and it has particular relation to a dental switch-board bracket-table.

One object of my invention is to provide a dental table having a plurality of instruments and controlling switches so disposed thereon as to be readily accessible for use as well as for repair.

Another object of my invention is to provide a dental switch-board bracket-table, wherein the various instruments are mounted on a slide and are protected by a cover which also serves to permit the energization of the instruments only when the slide has been projected from the bracket-table a predetermined distance.

A further object of my invention is to provide a novel form of controlling switch for use in dental switch-board bracket-tables, wherein one element of the switch is mounted on the slide carrying the instruments and the other element may be brought into engagement only when the slide occupies a predetermined position.

A still further object of my invention is to provide in a device of the class described, common means for positively actuating a switch element and an instrument holder when the latter is so moved as to change the line of action of said means.

A still further object of my invention is to provide a switch adapted to devices of the class described, wherein a slight wiping action obtains as the switch elements are engaged and disengaged.

With these and other objects and applications in mind, my invention further consists in the details of construction and operation and arrangement, hereinafter set forth in the following description, claims and drawings, wherein

Fig. 1 is a horizontal sectional view of a dental unit embodying my invention, the sectional plane being taken on the line I—I of Fig. 2;

Fig. 2 is a detail longitudinal sectional view taken on the line II—II of Fig. 1, showing the slide in its retracted position;

Fig. 3 is a similar view showing the slide in its projected position and the instrument switch closed;

Fig. 4 is a detail side elevational view, partially in section, of the instrument locking device in its raised or ineffective position;

Fig. 5 is a view similar to Fig. 4, but showing the locking device in its lowered or effective position;

Fig. 6 is an enlarged perspective view of the movable contact element;

Fig. 7 is a similar view of the fulcrum member which limits the upward movement of the instrument holder; and

Fig. 8 is a top plan view of the locking plate of Figs. 1, 2 and 4.

In the illustrated form of my invention shown in the drawings, a dental switch-board bracket-table 1 comprises a casing 2, an open top of which may be normally closed by a circular plate 3 (Fig. 2) which is held in place by screws 4 passing therethrough and into lugs 5 extending from adjacent walls of the casing 2. The cover plate 3 has a central circular depression 6, at the center of which is mounted a pivot screw 7 which serves to hold in position a shallow metallic pan 8. The latter removably carries a glass tray 9 of substantially circular form. The glass tray 9 has an annular rib or flange 11 depending from its under side so as to engage more or less closely a dished central portion 12 of the pan 8. The edge of the tray 9 may have notches 13 for the purpose of holding dental instruments in position. The tray 9 may be supported on rubber buttons 14 held in any suitable manner on the tray 8.

The hollow casing 2 is designed to receive and support and normally house a number of dental instruments, such, for example, as an electrically heated cautery 15, an electrical mouth lamp 16, an electrically heated applicator 17, an air-heater 18, and an air-jet instrument 19, as shown in Fig. 1. Of course, other instruments may be used in addition to those just set forth, and I have shown the same for purposes of illustration only.

In the present instance, the several electrical instruments are mounted on a slide or drawer structure 21, (Figs. 3 and 4) opposite sides 23 of which are provided with longitudinally extending grooves 24. The latter are designed to receive guides or tracks 25 (Figs. 4 and 5) which may constitute the edges of plates 26 and 27, said plates being

respectively secured by screw members 28 to spaced pedestals 29 and 31. My invention of course is not to be strictly limited to this method of supporting the slide 21. For example the slide 21 may be provided with the tongues of guides 25 rather than the grooves 24.

An insulating supporting plate 32 is mounted beneath the guide strips 26 and 27 and it is secured to the same by end brackets 33 and screw members 34, all as shown in Fig. 4. The insulating supporting plate 32, which constitutes a terminal switch board for the electrical conductors (not shown) to be connected to the several instruments 15 to 19, inclusive, is provided with a plurality of pairs of spaced contact elements 35, 35. Each pair of contact elements 35, 35 is positioned in vertical alignment with the line of movement of one of the electrical instruments, so as to be engaged by a cooperating contact 37 (Fig. 6) carried by a vertically movable switch element 38 mounted on the longitudinally movable slide 21, all as will appear more fully hereinafter. In some instances, additional pairs of stationary contact elements 39, 39, may be mounted on the insulating support 32 and they are spaced from the adjacently positioned pairs of contact elements 35, 35 by a shield 41, as shown in Fig. 3 of the drawing.

A side portion 42 of the casing 2 in the line of movement of the slide 21 is provided with an opening 43, whereby the slide 21 as well as the instruments and associated mechanism may be moved outwardly from the casing 2. The outer edge of the slide 21 has rigidly secured thereto a plate 44 for closing the opening 43 when the slide 21 is in the fully retracted position of Figs. 1 and 2.

The slide 21 may be locked in either the fully extended position of Fig. 3 or the fully retracted position of Fig. 2 by means of an elongated lever 45 which is pivotally mounted by a screw member 46 to an under side of the slide 21. An outer end of the locking lever 45 is provided with a laterally offset portion 47, an outer arm 48 of which is designed to co-act with a conically formed inner end of a plunger 49 slidably mounted in a knob or handle 51 secured to the outer surface of the plate 44. The plunger 49 may be of such length as to provide an external handle portion 52, as illustrated in Fig. 1.

A spring 53, which extends between a lug 54 on the laterally offset portion 47 and a second lug 55 mounted on the under side of the slide 21 is positioned to the rear of the inner end of the plunger 49, whereby a movement of the latter may cause a corresponding movement of the locking lever 45. The spring 53 normally holds a recessed portion 56 (Fig. 1) of the lever 45 in engagement with a vertically positioned plate 57 (Fig. 8) mounted on a standard 58, the plate 57 being secured to the latter by means of a screw member 59. The slide 21 may thus be releasably locked in its retracted position within the casing 2 so long as the recess 56 of the locking lever 45 engages the adjacent edge of the plate 57.

Assuming the slide 21 in its fully retracted position, when the plunger 49 is moved inwardly, the locking lever 45 is released, permitting the slide 21 to be moved outwardly from the casing 2. As the slide 21 reaches the desired projected position, a recess 60 on the inner end of the locking lever 45 is actuated into engagement with a shoulder 61 of the plate 57 under the force of the spring 53. The slide 21 is thus locked against further outward or inward movement until the plunger 49 is again actuated inwardly to cause the disengagement of the recess 60 of the locking lever 45 and the locking shoulder 61.

The inner end of the slide 21 is provided with spaced vertical supports 62 and 63 carrying a pivot pin 64, the later providing a pivotal mounting for a plurality of tubular holders 65, there being one holder for each of the instruments 15 to 19, inclusive. The holders 65 may be supported in the normal horizontal position of Figs. 1 and 2 by means of a spring plate 66 extending transversely of the slide 21 and secured thereto by screw members 67. A free edge 68 of the spring plate 66 may be bent upwardly to form the supporting surface.

As hereinabove noted, my invention contemplates a dental switch-board bracket-table, wherein the electrical instruments shall be normally cut off from their sources of current supply so long as the slide 21 on which they are mounted is in any but its fully projected position outside of the casing 2, and even then shall not be connected to said source unless the proper instrument holder is swung upwardly through a predetermined angle. To this end, I provide an electrical switch for each of said electrical instruments, each switch comprising the vertically movable switch element 38 and the pairs of co-acting stationary contact elements 35, 35 and 39, 39.

Operating mechanism (Figs. 2 and 3) for each of the switch elements 38 includes means whereby the swinging upward through a small angle of any of the holders 65 causes the closing of the particular switch associated therewith and, as a result, a current flow to the instrument carried by said holder. When said holder is returned to its normal horizontal position, the associated switch is opened, cutting off the current flow to said instrument, while an inward movement of the slide 21 to its retracted posi-

tion within the casing 2 prevents a further actuation of the switch parts, all as will appear more fully hereinafter.

In order to secure the mode of operation just set forth, the base portion of each of the instrument holders 65 immediately adjacent to the pivoted end portion thereof is provided with a longitudinally extending recess 71 (Fig. 3). The portion of the slide 21 directly below the recess 71 is provided with a similar longitudinally extending opening 72, whereby an insulating member 73 carrying the spaced contact portions 37, 37 may be vertically moved from and into said opening 72, so as to engage and disengage, respectively, the pairs of co-acting stationary contact elements 35, 35 and 39, 39.

A free end of the insulating member 73 is provided with a recess 74, which engages a plate 75 extending transversely over the end portions of the several openings 72 when the member 73 is disposed in the opening 72. The insulating member 73 has rigidly secured to a remaining end an outwardly extending member 77 having a recess 78 on the upper side thereof adapted to receive the pivot rod 64 when in the raised position shown in Fig. 2. A free edge 79 of the upper side of the member 77 is fulcrumed in a recess 81 formed in a closed end portion 82 of the instrument holder 65.

The operating mechanism 69 for each switch comprises a member 83 (Fig. 7) having an intermediate portion 84 fulcrumed on an edge 85 of the recess 71 in the holder 65. An outer end of the member 83 extends through a slot 86 in a raised portion 87 of the transversely extending strip 75. The outer end of the fulcrumed member 83 bears against the upper side of the slide 21 and it has a limited range of movement by reason of a flange portion 88 which is formed on the edge thereof so as to engage the edge of the raised strip portion 87. A rod 89 has one end thereof fulcrumed on an intermediate edge 91 of the movable switch element 38 and the other end in slidable engagement with a perforated member 92 movably mounted on the remaining end of the fulcrumed member 83. A spring 93 encircles the rod 89 and engages the abutment formed on one end, and the perforated member 92 mounted on the other end.

The several fulcrumed points as well as the spring-pressed rod 89 are so disposed that when the latter is actuated in accordance with an upward movement of the tubular holder 65, the line of action of the spring-pressed rod 89 is changed from that shown in Fig. 2, where the movable switch element 38 is forcibly held in the opening 72 and the instrument holder 65 is similarly held in its normally horizontal position, to that shown in Fig. 3. In the latter figure, the switch element 38 is shown extending downwardly from the opening 72 and the instrument holder 65 is shown in its raised position. When the instrument holder 65 is so moved downwardly as to shift the line of action of the spring-pressed rod 89, the switch element 38 and the instrument holder 65 are snapped into the position shown in Fig. 2. Hence it may be seen that when the slide 21 is moved out of the housing 2 into its extended position, the switches of the several electric instruments 15 to 19, inclusive, may be opened and closed upon an angular movement of said electrical instruments.

As the switch element 38 moves into and out of engagement with the co-acting stationary switch elements 35 and 39, a slight longitudinal movement occurs, having a wiping action. This is of importance inasmuch as it insures good contact when the switch is closed, and it also facilitates the opening of the switch. The longitudinal movement above noted is due to the fact that the movable switch element 38 is fulcrumed on the instrument holder at a point to one side of the pivot pin 64. Thus when the instrument holder 65 is raised from the position of Fig. 2 to that of Fig. 3, the fulcrum point of the movable contact element 38 is not only moved downwardly but forwardly, and the forward movement is greatest after the operating mechanism 69 has caused the lowering of the switch element 38.

In order to prevent the actuation of the switch elements 38 by a movement of the instrument holders 65 prior to the movement of the slide 21 into its extended position, I pivotally mount a shield or locking member 94 on standards 95 which are secured to the guide plates 26 and 27, respectively. The mounting of the shield 94 is such that said shield may be moved from the effective position shown in Fig. 5, where the instrument holders 65 are horizontal, to an ineffective position, as shown in Fig. 4, where the holders 65 are inclined. The shield 94 may be retained in its effective position when the slide 21 is in any but the extended position by a projecting shoulder portion 96, which is so positioned as to extend into the longitudinal recess 24 formed in the edge of the slide 21.

When the slide 21 is moved into its extended position, the shoulder 96 is actuated clear of the recess 24, as shown in Fig. 4. As the slide 21 assumes the latter position, the shield 94 which is so balanced as to tend to return to its effective position, may be positively actuated into its ineffective position by means of a projecting portion 97 of the pivot rod 64 which engages a shoulder portion 98 of the cover or locking plate 94. Thus the locking plate 94 prevents an angular movement of the instrument holders 65 until the slide 21 occupies its extreme pro-

jected position, at which time, said locking plate 94 is released and forcibly moved into its ineffective position.

When it is desired to return the slide 21 to its fully retracted position, a force is exerted against the end portion 52 of the plunger 49, rendering ineffective the locking lever 45, whereupon a movement of the slide 21 causes a corresponding downward movement of the shield 94 and the latter occurs with such force as to cause the instrument holders 65 to assume their normal horizontal position, thereby saving the time necessary to return individually each of the instruments to its lowered position. The shield 94 also insures the proper positioning of the movable switch elements 38, and this is particularly important when the slide 21 is being actuated from the retracted position to the projected position, for if the switch elements 38 are in their lowered position at this time, they will be actuated into the supporting plate 32 and damaged. The engagement of the shoulder 96 of the cover plate 94 with the longitudinally extending recess 24 of the slide 21 causes the locking of the cover 94 in its effective position and this position is maintained so long as the slide 21 is in any but its fully projected position.

The range of movement of the cover plate 94 may be adjusted by means of a screw member 99 which extends downwardly from the same and into engagement with the adjacent top side of the slide 21. In order to simplify the description of my invention, the necessary cable connections to the several electrical instruments have not been shown, but a pair of cable supports 101 extending from the slide 21 are illustrated in Fig. 1.

From the foregoing description, it is apparent that the electrical instruments 15 to 19, inclusive, may be energized only when the instrument slide 21 occupies its fully extended position—at which point it is locked by the lever 45. When the lever 45 has been rendered ineffective by the plunger 49, a return movement of the slide 21 automatically causes the opening of the instrument switches, the de-energization of the instruments and the return of the latter to their normal locked position.

While I have shown only one embodiment of my invention, for the purpose of describing the same and illustrating its principles of construction and operation, it is apparent that various changes and modifications may be made therein without departing from the spirit of my invention, and I desire, therefore, that only such limitations shall be imposed thereon, as are indicated in the appended claims or as are demanded by the prior art.

I claim:

1. In combination, a drawer, a pivoted instrument support carried thereby, and an electrical switch, one contact element of which is movably carried by said drawer and adapted to be actuated in accordance with the pivotal movement of said instrument support.

2. In a dental unit, an instrument holder having a pivotal support, and an electric switch, one contact element of which is fulcrumed on said instrument holder at a point spaced from said pivotal support so as to be actuated by the same, the other element of said switch being mounted in spaced relation to said holder.

3. Apparatus comprising a casing, a member movably mounted therein, an instrument holder mounted on said movable member, an electric switch, and means whereby the operation of said switch may be controlled by said instrument holder, one element of said switch being carried by said movable member.

4. Apparatus comprising a supporting structure, a member movably mounted thereon, an instrument holder pivotally mounted on said movable member, and an electric switch, one element of which is mounted on said supporting structure, the other element of which is fulcrumed on said instrument holder, whereby the latter may effect the operation of said switch.

5. In a dental unit, a switch-board bracket-table comprising a drawer, an instrument holder movably mounted on said drawer, and an electric switch, one element of which is mounted on said drawer and adapted to be actuated by said instrument holder relative to said drawer.

6. Apparatus comprising a supporting structure, a movable member having projected and retracted positions, an instrument holder movably mounted on said member, a switch, of which one element is mounted on said supporting structure, the other element on said movable member and so positioned as to be actuated in accordance with the operation of said instrument holder, and means permitting the actuation of said instrument holder relative to said member only when the latter occupies one of said positions.

7. In a dental unit, the combination with a movable member, of an instrument holder movably mounted thereon and provided with a recess, and a switch element mounted for movement in said recess in accordance with the actuation of said instrument holder.

8. A dental unit comprising a casing, a supporting structure mounted therein, a longitudinally movable member supported on said structure, an instrument holder pivotally mounted on said member, and a switch including a stationary contact element and a movable contact element, said movable contact element being carried by said member

and actuated in accordance with the pivotal movement of said instrument holder.

9. Dental apparatus comprising a casing, a slide therefor, an instrument holder movably mounted on said slide, a stationary contact element, a cooperating movable contact element mounted on said slide, and resilient means interconnecting said movable contact element and said instrument holder, whereby the operation of the latter may cause a movement of said movable contact element.

10. Apparatus comprising a casing, a slide therefor, an instrument holder movably mounted on said slide, a movable contact element mounted on said slide, resilient means interconnecting said movable contact element and said instrument holder, whereby the operation of the latter causes a positive movement of said movable contact element, and means preventing a movement of said instrument relative to said slide in certain positions of the latter.

11. Dental apparatus including a slide having projected and retracted positions, a supporting member, a contact element carried by said member, an instrument movably mounted on said slide, a second contact element so mounted on said slide as to be actuated in accordance with the operation of said instrument, means having effective and ineffective positions, whereby said instrument may be respectively locked and released, and means carried by said slide for actuating said locking means from one of said positions to the other when said contact elements are in a predetermined spaced relation.

12. Dental apparatus comprising a casing, a slide, an instrument movably mounted on said slide, and means controlled by said slide for locking said instrument against movement relative to said slide when the latter occupies a predetermined position.

13. Dental apparatus comprising a casing, a slide, an instrument movably mounted on said slide, means for locking said instrument against movement relative to said slide when the latter occupies certain positions, said locking means comprising a member having effective and ineffective positions, and means carried by said slide for actuating said locking means from one position to the other.

14. Apparatus comprising a casing, a slide, an instrument movably mounted on said slide, means for locking said instrument against movement relative to said slide when the latter occupies certain positions, said locking means comprising a member having effective and ineffective positions, said member being retained in said effective locking position so long as said slide occupies certain predetermined positions, and means carried by said slide for actuating said locking means into its ineffective position.

15. A dental unit comprising a support, a slide therefor, an instrument mounted on said slide for movement relative thereto, means carried by said support for permitting a relative movement of said instrument with respect to said slide only when the latter occupies a predetermined position, said locking means having effective and ineffective positions, means whereby said locking means may be positively actuated from one position to the other, and means for adjusting the range of movement of said locking means.

16. Apparatus comprising a support constituting a guideway, a slide having portions cooperating with said guideway, a member pivotally mounted on said slide and movable from a lower position to an upper position, means for permitting said latter movement only when said slide is in a predetermined position, said means comprising movable locking means having effective and ineffective positions, said locking means having one portion thereof cooperating with said slide portions in such manner as to release said locking means only when said slide approximates said predetermined position, and means for positively actuating said locking means.

17. Apparatus comprising a support constituting a guideway, a slide having portions cooperating with said guideway, a member pivotally mounted on said slide and movable from a lower position to an upper position, means for permitting said latter movement only when said slide is in a predetermined position, said means comprising movable locking means having effective and ineffective positions, said locking means having one portion thereof cooperating with said slide portions in such manner as to release said locking means only when said slide approximates said predetermined position, and means for positively actuating said locking means into its ineffective position, said locking means portion being so disposed with respect to said slide that when the latter is moved from said predetermined position, the locking means is positively actuated from its ineffective position to its effective position.

18. Dental apparatus comprising a support constituting a guideway, a slide having portions cooperating with said guideway, an instrument holder movably mounted on said slide and movable from a lower position to an upper position, means for permitting said latter movement only when said slide is in a predetermined position, said means comprising movable locking means having effective and ineffective positions, said locking means having one portion thereof cooperating with said slide portions in such manner as to release said locking means only when said slide approximates preposition, and means for pos-

itively actuating said locking means into its ineffective position, said locking means portion being so disposed with respect to said slide that when the latter is moved from said predetermined position, the locking means is positively actuated from its ineffective position to its effective position so as to actuate positively said instrument holder into its lower position.

19. Dental apparatus comprising a casing, a slide therefor, an instrument movably mounted on said slide, a switch, one element of which is rigidly mounted on said casing, the other element of which is carried by said slide and adapted to be operated in accordance with the actuation of said instrument, and locking means comprising a pivotally mounted plate adapted to permit the operation of said switch only when said contact elements are in cooperative relation.

20. A dental unit including a support forming a guideway, a slide having a portion cooperating with said guideway, a shield pivotally mounted on said support and having a portion cooperating with said slide portion so as to lock said shield for certain positions of said slide, and means for positively actuating said shield into an ineffective position when said slide occupied a predetermined position.

21. Apparatus comprising a support forming a guideway, a slide having recessed portions operative in said guideway, a shield movably mounted on said support and provided with a shoulder portion extending into one of said recesses, whereby said shield may be retained in position, said shoulder being disengaged from said recess when said slide occupies a predetermined position, and a shoulder for positively actuating said shield when said slide moves into said predetermined position.

22. Apparatus comprising a support forming a guideway, a slide having recessed portions operative in said guideway, a shield movably mounted on said support and provided with a shoulder portion extending into one of said recesses, whereby said shield may be retained in position, said shoulder being disengaged from said recess when said slide occupied a predetermined position, a shoulder for positively actuating said shield when said slide moves into said predetermined position, and means for adjusting the extent of movement of said shield.

23. Apparatus comprising a support forming a guideway, a slide having recessed portions operative in said guideway, a shield movably mounted on said support and provided with a shoulder portion extending into one of said recesses, whereby said shield may be retained in its effective position, said shoulder being disengaged from said recess when said slide occupies a predetermined position, a shoulder for positively actuating said shield into its ineffective position when said slide moves into said predetermined position, and means for adjusting the extent of movement of said shield, said first-mentioned shoulder being so disposed adjacent to one end of said slide, when said shield is in its ineffective position, that a sudden backward movement of said slide causes the latter to engage said first-mentioned shoulder with a force sufficient to actuate positively said shield to its effective position.

24. Apparatus comprising a support, a member movably mounted thereon, an instrument holder pivotally mounted on said movable member, one end of said instrument holder being recessed and having an opening, a movable contact element fulcrumed in said recessed end portion, and means for actuating said switch in accordance with the operation of said instrument holder.

25. Dental apparatus comprising a casing having a side opening, a guideway in said casing, a slide movable on said guideway from a retracted position in said casing to an extended position through said opening, a receptacle pivotally mounted on said slide and provided with a hollow end portion, a movable contact element fulcrumed in said hollow end portion, and means whereby said contact element may be actuated in accordance with the operation of said receptacle.

26. Apparatus comprising a support, a device pivotally mounted on said support and provided with a hollow portion immediately adjacent to said pivotal mounting, a switch member fulcrumed in said hollow portion, and a movable spring so associated with said device and said switch member that a movement of the former causes said spring to exert a force on said switch member in either of two directions.

27. Apparatus comprising a movable support, a pair of members fulcrumed thereon, and a spring-actuated rod extending between said fulcrumed members, whereby a movement of said support may so shift the line of action of said spring as to cause said members to move in opposite directions.

28. A movable instrument holder, a pair of members fulcrumed thereon, and a spring extending between said fulcrumed members, whereby the line of action thereof may be shifted in accordance with the actuation of said holder.

29. Apparatus comprising a tubular device having a recessed end portion, a member fulcrumed on said end portion, a second member fulcrumed on one edge of said recess, and a spring extending between said members and so positioned that the line of action thereof may be shifted, to cause opposite movements of said members, in accordance with the actuation of said tubular device.

30. Apparatus comprising a supporting

element, a tubular device having a recess, a pivot pin extending through the walls of said tubular device, a member fulcrumed on the end portion of said device, a second member fulcrumed on one edge of said recess, and a spring extending between said members and so positioned that the line of action thereof may be shifted to cause opposite movements of said members, the movement of one of said members in one direction being limited by said element.

31. Dental apparatus comprising a supporting element, a tubular device having a recess, a pivot pin extending through the walls of said tubular device, a member constituting a switch element fulcrumed on the end portion of said tubular device, a second member fulcrumed on one edge of said recess, and a spring extending between said members and so positioned that the line of action thereof may be shifted to cause opposite movements of said members in accordance with the actuation of said tubular device, the movement of one of said fulcrumed members in one direction being limited by the engagement of said elements.

32. Dental apparatus comprising a supporting member, an instrument holder pivotally mounted thereon, a movable switch element, means for actuating said instrument holder, and a spring extending between said last-mentioned means and said switch element in such manner that when the position of said spring is changed, said instrument holder and said switch element are actuated under the force of said spring.

33. A dental unit comprising a supporting member, an instrument holder movably mounted thereon, a movable switch element, means for actuating said instrument holder, and a spring extending between said last-mentioned means and said switch element in such manner that when the position of said spring is changed, said instrument holder and said switch element are actuated with a snap movement in opposite directions under the force of said spring.

34. A support, an instrument holder having a tubular end portion pivotally mounted thereon and provided with a recess on one side thereof, a switch element extending up into said recess and fulcrumed on the end of said tubular element, a second member fulcrumed on one edge of said recess and having a limited range of movement, and a spring-pressed rod having one end pivotally engaging one of said fulcrumed members, and the other end slidably engaging the other of said fulcrumed members, whereby a shifting of the line of action of said spring may cause opposite movements of said instrument holder and said switch element.

35. A support, an instrument holder having a tubular end portion movably mounted thereon and provided with a recess on one side thereof, a switch element extending up into said recess and fulcrumed on the end of said tubular element, a second member fulcrumed on said instrument holder and having a limited range of movement, a spring-pressed rod having one end pivotally engaging one of said fulcrumed members, and the other end slidably engaging the other of said fulcrumed members, whereby a shifting of the line of action of said spring may cause opposite movements of said instrument holder and said switch element, a casing providing a slidable mounting for said support, and a stationary switch element mounted in said casing and adapted to cooperate with said first-mentioned switch element.

36. A support, an instrument holder having a tubular end portion pivotally mounted thereon and provided with a recess on one side thereof, a switch element extending up into said recess and fulcrumed on the end of said tubular element, a second member fulcrumed on one edge of said recess and having a limited range of movement, a spring-pressed rod having one end pivotally engaging one of said fulcrumed members, and the other end slidably engaging the other of said fulcrumed members, whereby a shifting of the line of action of said spring may cause opposite movements of said tubular member and said switch element, a casing providing a guideway for said support, a cooperating stationary switch element mounted in said casing, and means for permitting the actuation of said instrument holder only when said support occupies a predetermined position.

37. An instrument slide having a pivotally mounted holder provided with an opening, said slide having a complementary opening, a switch element fulcrumed on said holder, and means whereby said switch element may be moved in said slide opening in accordance with the actuation of said holder.

38. A pivoted member adapted to support an instrument, a second member constituting a movable contact element of a switch fulcrumed on said pivoted member, and snap mechanism for causing the actuation of one of said members upon a movement of the other, the fulcrumed point of said second member being so disposed with respect to said pivoted member that an additional movement is imparted to the actuated member.

39. In a dental unit, the combination with a drawer having a relatively movable instrument holder mounted thereon and also provided with a recess, of a switch element positioned to extend into said recess, and means whereby said switch element may be moved relative to said recess in accordance with the actuation of said instrument holder.

40. Dental apparatus comprising a mov-

able member carrying a relatively movable instrument support, said movable member being provided with an opening, and a switch element mounted for movement in said opening in accordance with the actuation of said instrument support.

41. A dental switch-board bracket-table comprising a drawer, an instrument holder movably mounted on said drawer, means for locking said holder against movement relative to said drawer when the latter occupies certain positions, said drawer having a recess, a switch element extending into said recess, and means whereby said switch element may be actuated relative to said recess upon a movement of said holder.

42. A dental switch-board bracket-table having a drawer, an instrument holder movably mounted on said drawer, and means whereby said instrument holder may be locked against movement relative to said drawer when the latter occupies certain positions.

43. In a dental unit, a movable member adapted to support an instrument, a second member fulcrumed on said movable member, and means for causing the actuation of one of said members upon a movement of the other, the fulcrum point of said second member being so disposed with respect to said movable member that an additional movement is imparted to the actuated member.

44. A dental switch-board bracket-table having a movable member adapted to support an instrument, a second member fulcrumed on said movable member and adapted to serve as one contact element of a switch, and means for causing the actuation of one of said members upon a movement of the other, the fulcrum point of said second member being so disposed with respect to said movable member that an additional movement is imparted to the actuated member.

45. A switch-board bracket-table having a drawer provided with a movable member adapted to support an instrument, a second member fulcrumed on said movable member, and snap mechanism for causing the actuation of one of said members upon a movment of the other, the fulcrum point of said second member being so disposed with respect to said movable member that an additional movement is imparted to the actuated member.

46. A switch-board bracket-table comprising a casing, a longitudinally movable member positioned therein, an instrument holder pivotally mounted on said member, and a switch including relatively movable contact elements, of which one is carried by said member and adapted to be actuated upon a pivotal movement of said instrument holder.

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