A. J. SWEET.

SECTIONAL LIGHTING FURNITURE.

APPLICATION FILED FEB. 10, 1919.

1,438,344.

Patented Dec. 12, 1922.

7 SHEETS—SHEET 1.

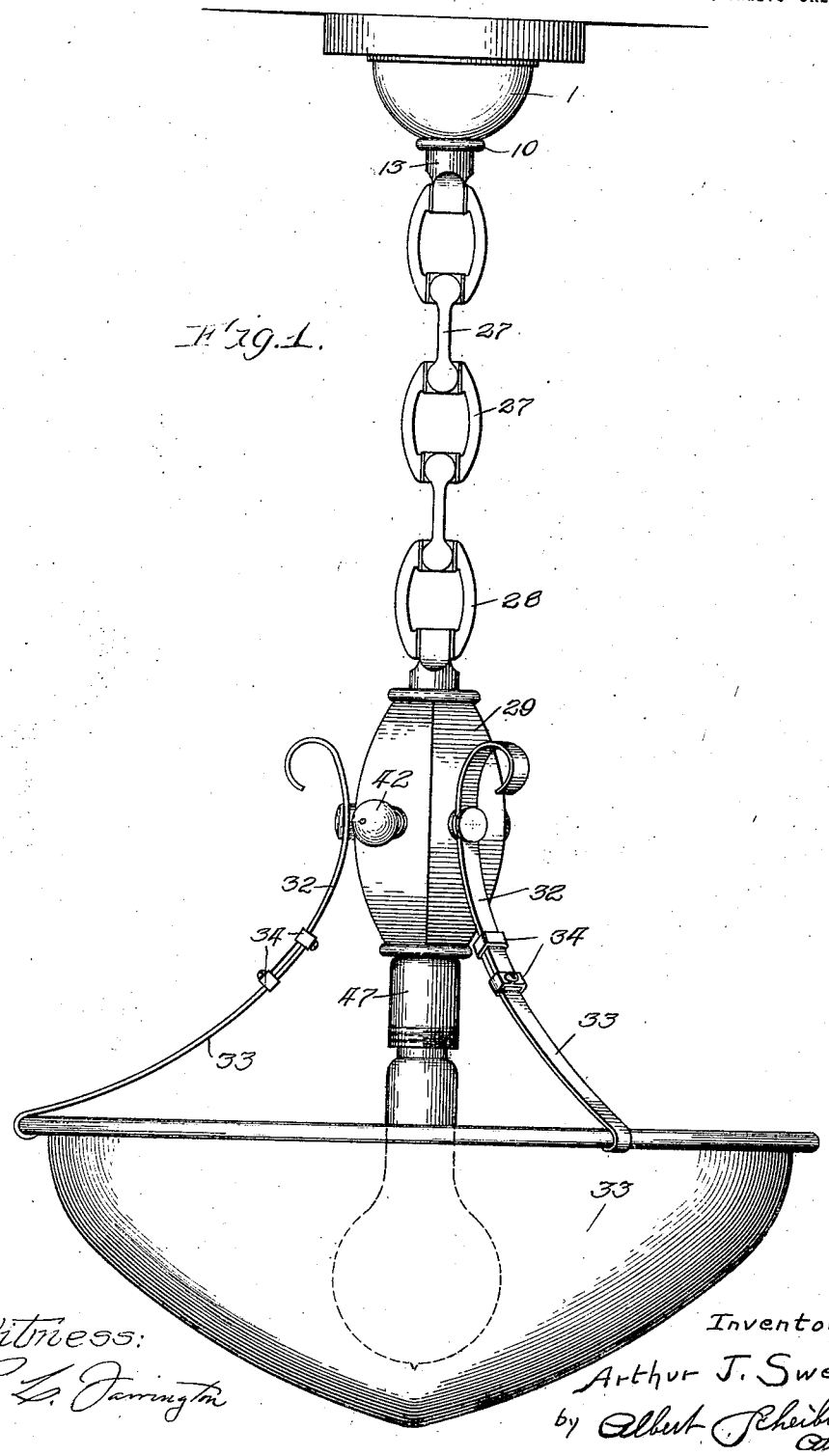


Fig. 1.

Witness:
R. L. Farrington

Inventor:
Arthur J. Sweet
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SECTIONAL LIGHTING FURNITURE.

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7 SHEETS—SHEET 2.

Fig. 3.

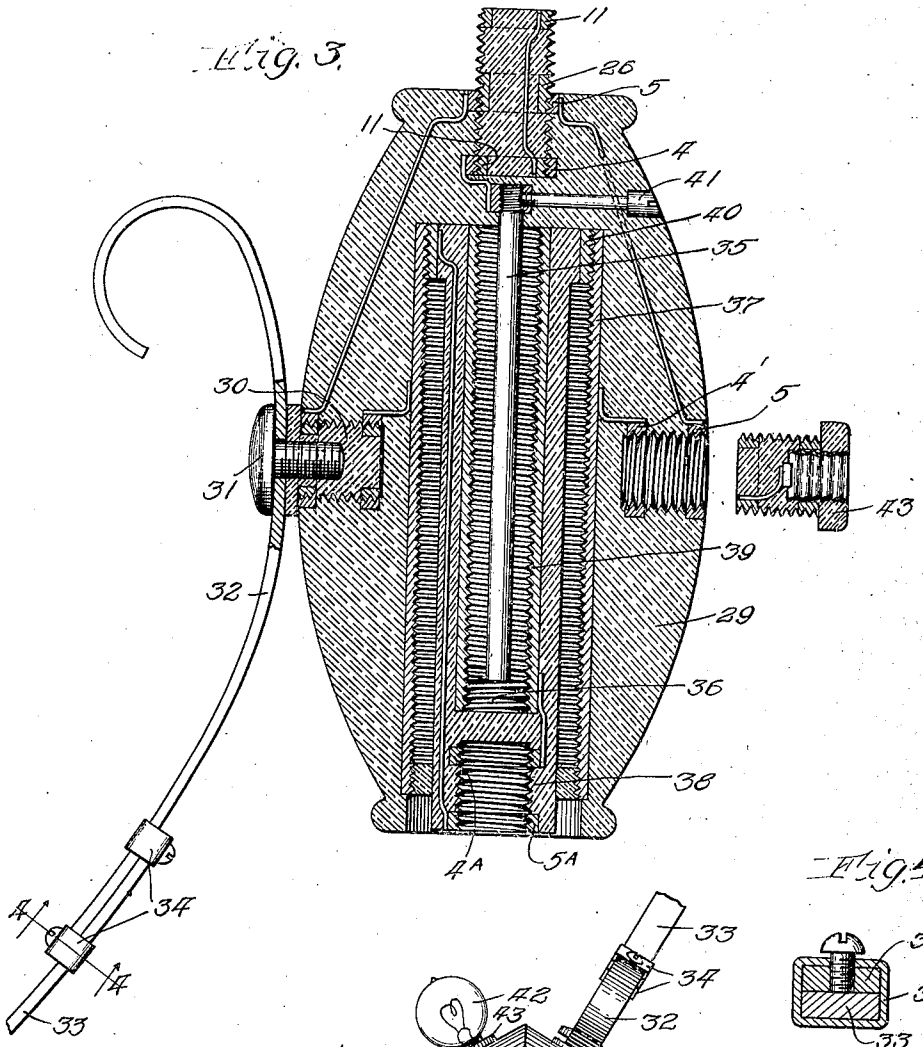
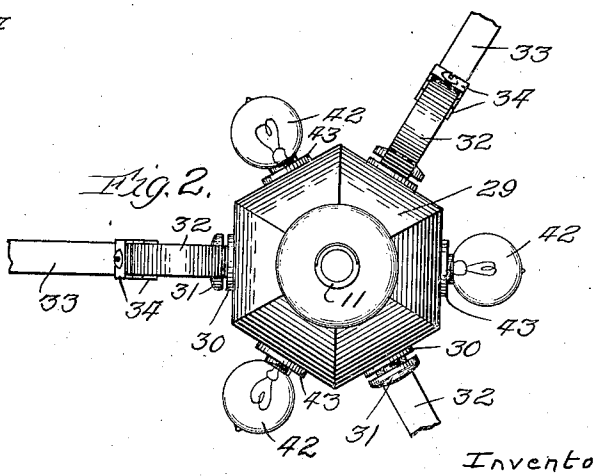


Fig. 4.

Fig. 2.



Witness:
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SECTIONAL LIGHTING FURNITURE.

APPLICATION FILED FEB. 10, 1919.

1,438,344.

Patented Dec. 12, 1922.

7 SHEETS—SHEET 3.

Fig. 14.

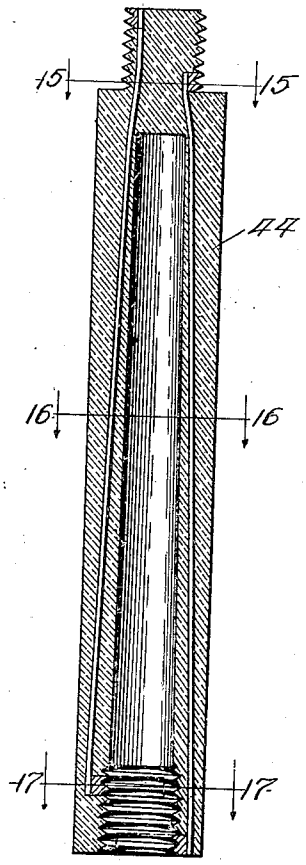


Fig. 5.

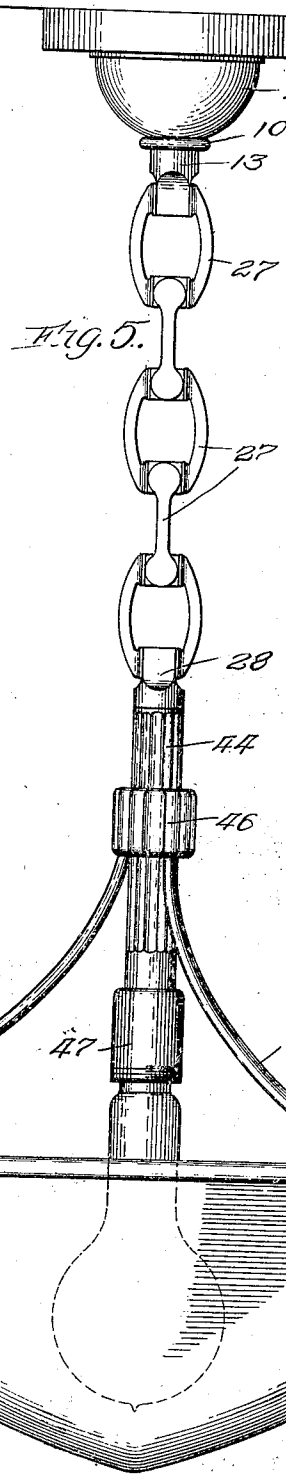


Fig. 15

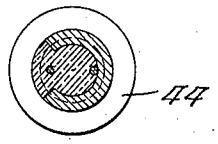


Fig. 16.

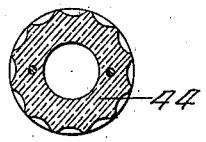
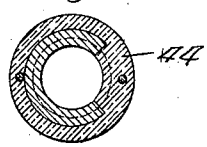


Fig. 17.



Witness:
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SECTIONAL LIGHTING FURNITURE.

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7 SHEETS—SHEET 4.

Fig. 6.

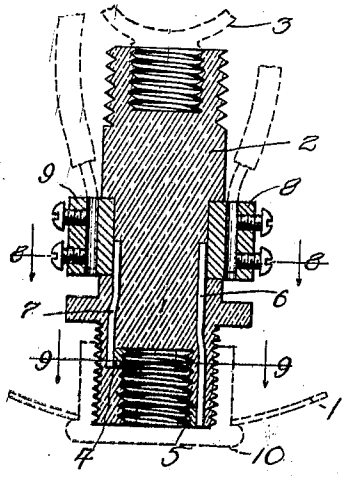


Fig. 7.

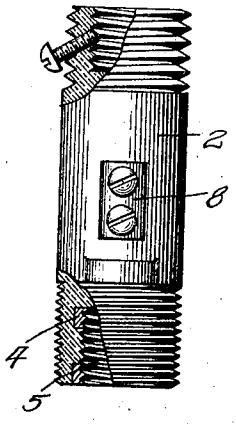


Fig. 8.

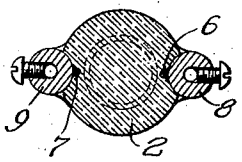


Fig. 9.

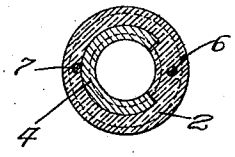


Fig. 10.

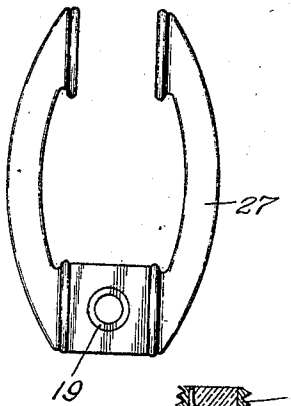


Fig. 11.

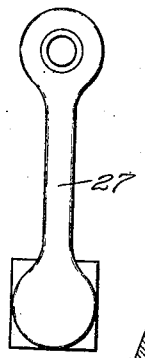


Fig. 12.

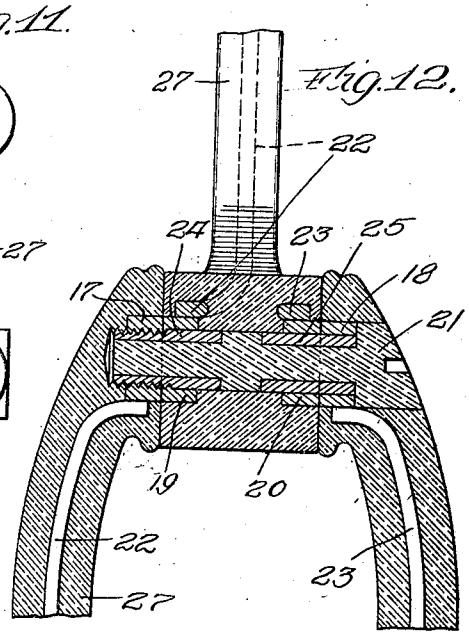
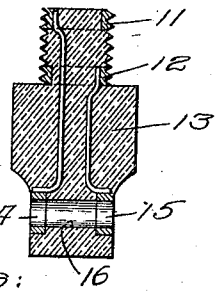


Fig. 13.



Witness:
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SECTIONAL LIGHTING FURNITURE.

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Patented Dec. 12, 1922.

7 SHEETS—SHEET 5.

Fig. 18.

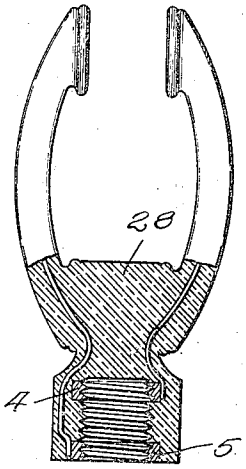


Fig. 21.

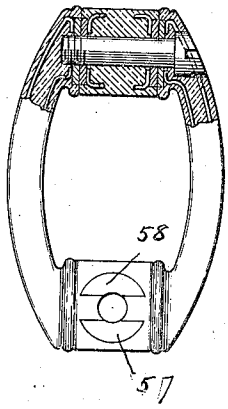


Fig. 19.

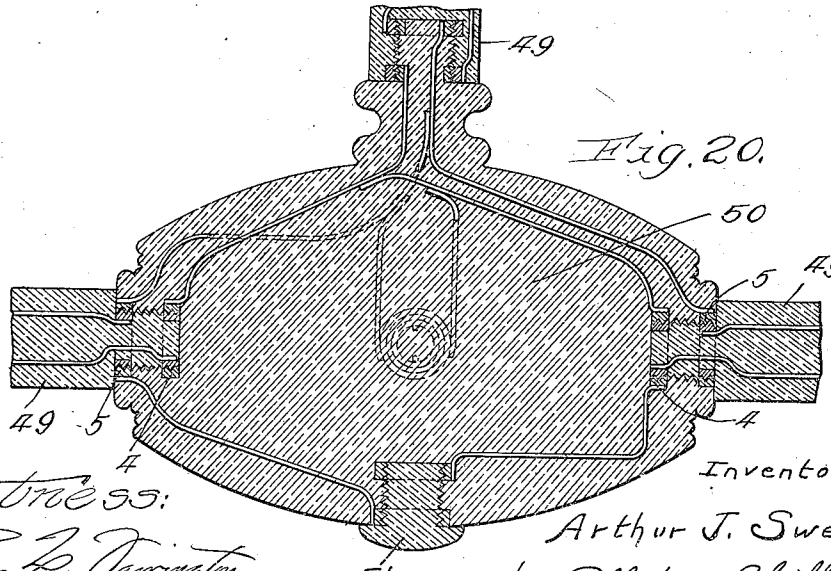


Fig. 20.

Witness:
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A. J. SWEET.

SECTIONAL LIGHTING FURNITURE.

APPLICATION FILED FEB. 10, 1919.

1,438,344.

Patented Dec. 12, 1922.

7 SHEETS—SHEET 6.

Fig. 22

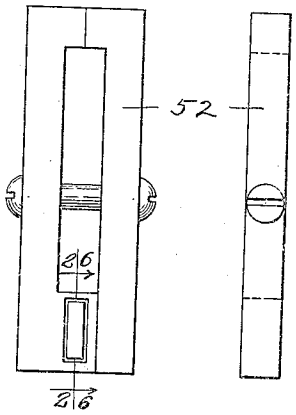


Fig. 23.

Fig. 24.

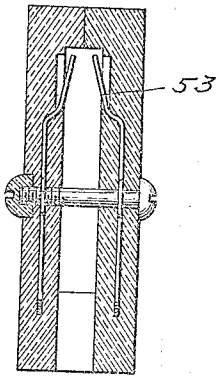


Fig. 25

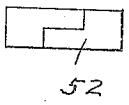


Fig. 2

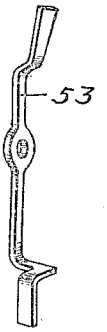


Fig. 26.

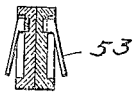


Fig. 31.

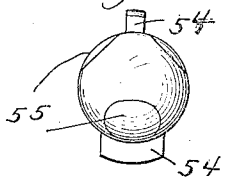


Fig. 33.

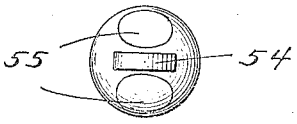


Fig. 32.

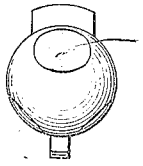


Fig. 28

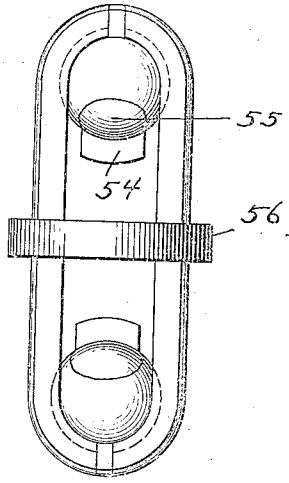


Fig. 29

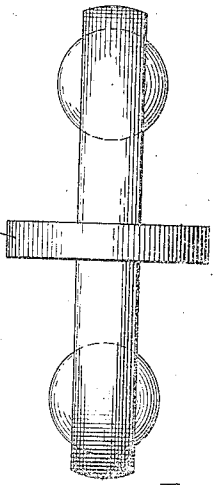
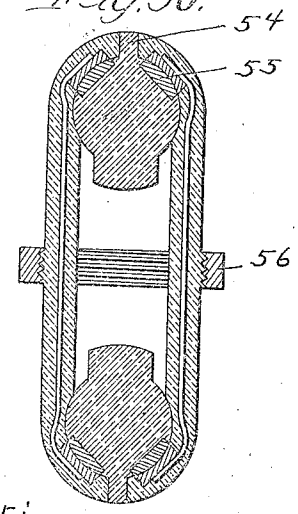


Fig. 30.



Witness:

P. L. Darrington

Inventor:

Arthur J. Sweet

by Albert Scheible, Attorney

A. J. SWEET.

SECTIONAL LIGHTING FURNITURE.

APPLICATION FILED FEB. 10, 1919.

1,438,344.

Patented Dec. 12, 1922.

7 SHEETS—SHEET 7.

Fig. 34

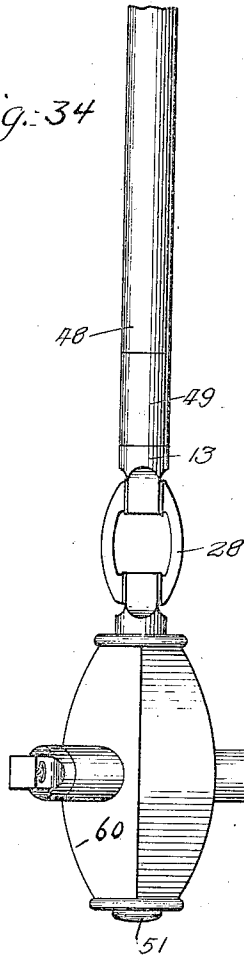


Fig. 37

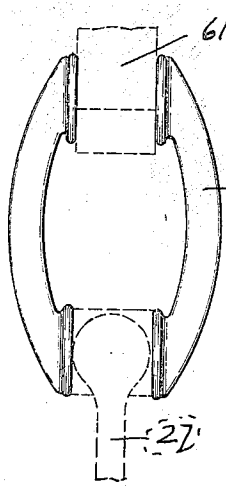


Fig. 35

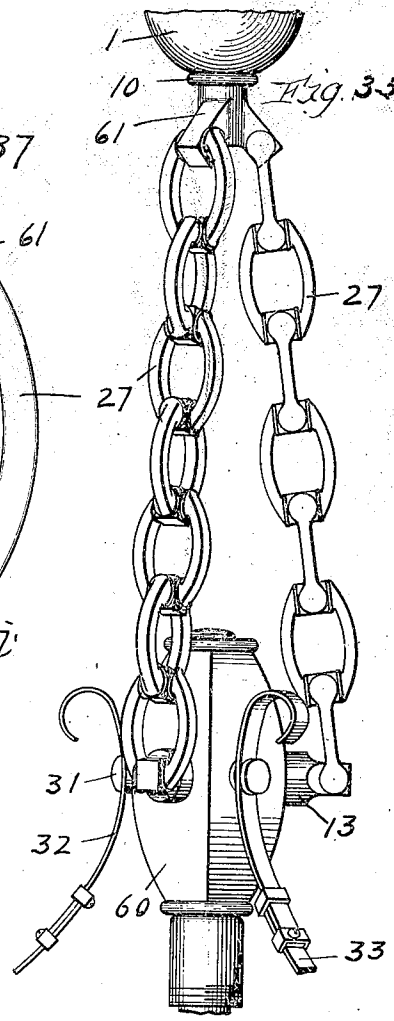
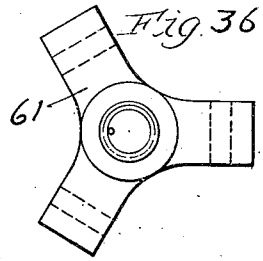


Fig. 36



Witness:

R. L. Farrington.

Inventor:

Arthur J. Sweet

by Albert Scheible, Attorney

Patented Dec. 12, 1922. 1,438,344

UNITED STATES PATENT OFFICE.

ARTHUR J. SWEET, OF MILWAUKEE, WISCONSIN.

SECTIONAL LIGHTING FURNITURE.

Application filed February 10, 1919. Serial No. 276,053.

To all whom it may concern:

Be it known that I, ARTHUR J. SWEET, citizen of the United States, residing at Milwaukee, Wisconsin, have invented certain new and useful Improvements in Sectional Lighting Furniture; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to electric lighting fixtures, and in certain general aspects aims to provide fixture elements which may be combined into a practically endless variety of sizes, shapes and designs of electrical fixtures by the mere mechanically assembly of the various parts. Taken in this general aspect, my invention aims to provide the same flexibility of construction with a relatively small quantity of stock parts as is commonly afforded in the furniture line by the so-called sectional furniture; to provide fixtures which may be disassembled, moved about and reassembled to suit widely varying tastes and requirements, and to utilize various sizes and types of light-distributing devices.

Heretofore, the lighting fixture industry has suffered greatly from a lack of standardization, so that the installation of fixtures has commonly required the fabricating of specially sized parts and the consequent delays in securing the fixtures, it being customary for fixture dealers to carry in stock only single samples of completely finished fixtures and relatively few and petty fixture parts. Consequently, the fixtures for each job had to be specially manufactured in small quantities and from parts which at best were only partially finished prior to the receipt of the order, thus involving a highly wasteful cost of manufacture. Taken in this aspect, my invention aims to standardize the parts for a great variety of fixtures, so that these parts can readily be manufactured in quantities at a corresponding reduction in their cost, and so that the same constituent elements can be used in constructing fixtures to meet different ceiling heights, to utilize different sizes and characters of light-controlling devices, and to suit other variations in the requirements.

Furthermore, the specially fabricated fixtures as heretofore in use were adapted to particular ceiling heights, light-controlling devices, fixture spacings and other local conditions, and therefore unsuited to any changes in these conditions. Considered in this aspect, my invention aims to provide fixtures which can readily be altered to meet changes in the requirements, thus allowing them to be adapted not only to other types or sizes of lamps and light-controlling devices, but also permitting both the appearance of the fixtures and the general lighting effect to be varied as desired.

In another aspect, my invention aims to provide fixture sections each of which will carry its own electrical conductor equipment and each of which sections will be so arranged that the mere mechanical connecting thereof to the next section will automatically afford the corresponding electrical connection between the conductor portions carried by the sections. In other words, instead of providing fixture parts after the manner heretofore customary and using these parts as runways for subsequent wiring, I equip each part with its own portions of the circuit so arranged that the parts are already wired and automatically do their own electrical connecting when assembled, thereby avoiding the cutting and joining of wires and permitting the entire fixture to be assembled with the aid of such simple tools as a screw-driver and a wrench.

Furthermore, I aim to provide sectional fixture parts adapted for interchangeable mechanical interconnection and presenting no exterior electrically-live portions when the parts are connected to each other as under the conditions of use. In the preferable form of my invention I therefore compose the sectional fixture parts primarily of insulating material within which the conductors designed to carry the current are mounted or imbedded. In a form of my invention less preferred because probably more clumsy and more costly to manufacture, I would make the sectional fixture parts of a metallic shell, the enclosed conducting parts being separated from such shell, as well as from other enclosed conducting parts of different potential, by the interposition of insulating material.

In still another aspect, I aim to provide sectional fixture parts adapted for interchangeable connection to each other and including not only parts which exactly duplicate each other, but also parts varying in size, and parts varying widely in shape and function. For example, I aim to provide

stem sections, link sections, circuit-distributing bodies and shade-holder-supporting bodies all equipped for interchangeable mechanical connection to one another and likewise equipped for automatically affording corresponding electric circuit connections when thus mechanically interconnected. I also aim to include in such interchangeable parts lamp sockets adapted for direct connection to any of the other sections, such as those above enumerated; and to include means, such as plugs, adapted to conceal the exposed connecting parts on any section used substantially as a fixture terminal, and likewise adapted to guard against leakage or short circuiting of the current by engagement of other objects with the contacts at unemployed terminals of any section. When including shade-holder-supporting sections, I aim to provide means for relatively moving the holder and the associated lamp socket with respect to one another, thereby permitting a proper adjustment thereof to correspond to different sizes of lamps and different types of light-controlling devices carried by such a holder. I also aim to provide simple means for adjusting such a holder to adapt the same to light-controlling devices having holder engaging rims of different sizes, and desirably aim to arrange the interconnecting parts of the various sections of the lighting furniture as designed by me in such a manner that the weight of each element will aid in securing a firm and ample electrical connection with the section supporting the same.

Moreover, I aim to accomplish the above objects with a comparatively small variety of sections, so that the great majority of conditions can be met from a stock representing so small an investment that it can readily be carried by the electrical contractor, the central station, or even the merchant who might like to vary the lighting equipment of his establishment from time to time. Still further objects will appear from the following specification and from the accompanying drawings in which

Fig. 1 is an elevation of a lighting fixture embodying my invention and including a body section having connecting portions disposed both at its ends and on its sides.

Fig. 2 is a fragmentary plan view of the same fixture taken from the top of the body section.

Fig. 3 is an enlarged and central vertical section through the body section of Fig. 1 and a part of one of the holder arms carried thereby, also showing a section through a miniature lamp socket arranged for direct connection to such a body section.

Fig. 4 is an enlarged transverse section through one of the connecting clamps on the holder portions of Fig. 1, taken along the line 4—4 of Fig. 3.

Fig. 5 is an elevation of another lighting fixture embodying my invention and including a section equipped for adjustably supporting a holder for a light-controlling device.

Fig. 6 is an enlarged and central longitudinal section through the terminal section concealed in Figs. 1 and 5, by the fixture canopy; Fig. 6 showing also in dotted lines the fixture stud to which this section attaches, the lower end of the canopy, and a portion of the bushing supporting the latter.

Fig. 7 is a fragmentary side elevation of the terminal section of Fig. 6.

Figs. 8 and 9 are cross-sections taken respectively along the lines 8—8 and 9—9 of Fig. 6.

Fig. 10 is an enlarged elevation of a single one of the link sections of Fig. 1 or Fig. 5.

Fig. 11 is a side view of the same.

Fig. 12 is an enlarged transverse section through the adjacent parts of two interconnected links and through the auxiliary member which secures them to each other.

Fig. 13 is an enlarged and central section through the link-attachment-section shown next to the bushing under the canopy in Figs. 1 and 5.

Fig. 14 is an enlarged longitudinal section through the stem section of Fig. 5.

Figs. 15, 16 and 17 are transverse sections taken respectively along the correspondingly numbered lines of Fig. 14.

Fig. 18 is an enlarged and fragmentary elevation of the lowest or terminal link section of either Fig. 1 or Fig. 5.

Fig. 19 is an elevation of a lighting fixture embodying my invention and including a series of superposed vertical stem sections, and also including links suspended from link-attachment-section carried by stem sections serving as horizontal arms.

Fig. 20 is an enlarged and central cross-section through the body section of Fig. 19 and parts adjacent thereto.

Fig. 21 is a fragmentary view showing a link section suitable for use according to my invention and providing duplicate conductor portions for each leg of the circuit.

Fig. 22 is an elevation of an alternative type of link, namely one comprising two duplicate halves bolted to each other.

Figs. 23, 24 and 25 are respectively side views, central longitudinal sections and end view of the link of Fig. 22.

Fig. 26 is an enlarged transverse section through Fig. 22 along the correspondingly numbered line in the latter figure.

Fig. 27 is a perspective view of one of the imbedded conductor parts of the link of Figs. 22 and 24.

Figs. 28, 29 and 30 are respectively a front elevation, a side elevation, and a central longitudinal section through another type

of fixture link suitable for use in embodiments of my invention, namely one in which the consecutive links are made in two halves connected to each other and to adjacent links by clamping the link halves against the ball-shaped elements of Figs. 31, 32 and 33.

Figs. 31, 32 and 33 are respectively a front view, a side view, and a top view of one of the ball-shaped elements of the link of Fig. 28.

Fig. 34 is a partial view of a fixture embodying my invention and including a distributing body section supporting horizontal arms and connected to both the pendant stem and the socket-supporting sections by link sections.

Fig. 35 is a perspective view showing my invention as employed in constructing a chain-suspended fixture, the third or rear chain being omitted to avoid confusing the drawing.

Fig. 36 is an enlarged plan view of the section connecting the upper ends of the link chains with the terminal section concealed by the canopy.

Fig. 37 is an enlarged elevation of one of the uppermost links, showing its connection to adjacent sections of the fixture.

Illustrative of what may be accomplished by the assembling of fixture sections constructed according to my invention, Fig. 1 shows a pendant lighting fixture including at its top a canopy 1 housing and normally concealing the entrance terminal section 2 of Figs. 6 and 7. This terminal section consists of an insulating body threaded at both ends and desirably having both male and female threads at its upper end so that it can be secured to either of the types of fixture support most commonly provided, the fixture stud or crowfoot 3 shown dotted in Fig. 6, or a plate with (female) threaded bore. The insulating body of this section also has at its lower end a female thread formed partly in the insulation itself and partly in incomplete metal rings 4 and 5 molded into the insulation and forming the lower electrical terminals of this fixture section. The terminal piece 5 is desirably disposed at or near the mouth of the thread, while the companion terminal 4 is spaced at such distance therefrom as to afford suitable insulation space. These threaded terminal pieces are connected respectively by wires 6 and 7 to binding posts 8 and 9 mounted on the exterior of the insulating body, as shown for example in Figs. 6, 7 and 8, the gap in the incomplete annular contact 4 being directed towards the wire 6, so as to permit ample insulation around this wire, as shown in Fig. 9, the posts 8 and 9 being held in place by their securement to the wires 6 and 7 which are molded into the insulation.

The lower end of the terminal section has an exterior thread for receiving a bushing 10 which supports the canopy 1. This bushing is designed not only to support the canopy but to permit the employment of a single standard canopy under varient conditions of installation, as follows: As between different installations, the position of the crowfoot 3, or other fixture-supporting means, varies somewhat with respect to the plane of the ceiling or wall, the extreme end of the crowfoot sometimes being in front of and sometimes behind this plane. This results in a proportionate variation, with respect to the said plane, of the end of the terminal section 2 to which the bushing 10 attaches. By making the interengaging threaded portions of the section 2 and the bushing 10 considerably longer than is needed for adequate mechanical attachment, the bushing may be screwed upon the section to a greater or less degree, thus providing an element of adjustment which permits the use of a canopy of fixed size under such variations in conditions of installation as normally occur in practice.

In installing the parts described in the several preceding paragraphs, the terminal section would be screwed upon the crowfoot 3 and the wires from the ceiling outlet brought to the binding posts after the manner of Fig. 6, thereby affording circuit connection to the terminal section of the fixture; after which all further electrical connections are afforded according to my invention without the attachment of any wires. In order to prevent the bared end of the circuit wire from extending far below the binding post 9 and making electrical contact with the canopy if same were made of metal, I desirably provide shoulder extensions of the insulating material from which the terminal section is desirably made. These extensions, shown just below the binding posts 9, acts as stops beyond which the wire cannot be conveniently pushed.

Where a link effect is desired, I first attach to the entrance terminal section a link-attachment section, such as the one shown in Fig. 13. This consists of an insulating body terminating at its upper end in a male thread corresponding to the female thread in the lower end of the terminal section 2 and having parts of the thread formed by metal inserts 11 and 12 spaced longitudinally of the axis of the thread by substantially the same distance as the metal terminal inserts 4 and 5 in the section 2. The insulating body 13 of this link attachment section has at its lower end a transverse bore extending partly through the insulation and also through contact terminals 14 and 15, which terminals are connected respectively to the terminals 11 and 12 by conductors imbedded in the insulation. This bore 16 corresponds in diameter to the

bore through the upper or free ends of the link section of Figs. 10 and 11, and the length of this bore corresponds closely to the distance between the free arm of the link as shown in Fig. 10. These free arm tips house contact rings 17 and 18 terminating at the gap in the link as shown in Fig. 12. The other or closed end of each link section has a bore of similar dimensions extending transversely of the bore through the free arm ends of the link, as shown at the lower end of Fig. 10, and this bore extends through contact rings 19 and 20 adapted respectively to contact with the rings 17 and 18 on the next adjacent links when the links are serially assembled. For this assembling, I desirably employ screws 21 as shown in Fig. 12, which screws operate both for forming a pivotal connection between successive links and for clamping the free ends of each link against the closed end of the next link, so as to insure a proper contact between the respective contact pairs 17 and 19, and 18 and 20, in spite of such variations in dimensions as may occur in ordinary manufacture. In each case, the contact ring 17 at one of the free ends of each link section is electrically connected to one of the contact rings 19 at the closed end of the same section by a wire 22 imbedded in one arm of the link, while the other contact rings 18 and 20 of each link are similarly connected by a wire 23 in the companion arm of the link. Consequently, the mere mechanical connecting of the links to each other as above described will automatically afford a twin-conductor connection from one to another, while entirely concealing the conductors, so that I avoid the inartistic appearance of cords threaded through the fixture links.

However, to guard a possible insufficiency of contacting in case the screws 21 should loosen, I desirably supplement the end contacts of the associated contact rings of consecutive link sections, by mounting auxiliary contact sleeves 24 and 25 on the screw 21, this screw being made of insulating material. The metal sleeves 24 and 25 are desirably at least equal in total length to the combined length of the adjacent contact rings, as shown in Fig. 12, from which figure it will also be obvious that gravity will operate for ensuring good electrical connection regardless of the adequate tightening of the screw 21. It will also be obvious that by substituting the link-attachment section of Fig. 13 for the upper link portion of Fig. 12, both electrical and mechanical connections would similarly be made from this link-attachment section to an adjacent link section.

After attaching any desired number of link sections to each other in the manner thus described, I terminate these (in the embodiment of Fig. 1) by using a terminal link as shown in Fig. 18, that is to say, a link having at its lower end a female thread corresponding to that of the lower end of the terminal section 2 of Fig. 6 and similarly including contact portions 4 and 5 as portions of the thread. Thus arranged, such a terminal link as shown in Fig. 18 affords a ready means for connecting a standard link to any fixture section having a male connecting end corresponding in its upper end with the section of Fig. 13, as for example to the stem section of Fig. 14. Likewise, if the connection is to be made to a fixture section terminating in a corresponding female end, such as the lower end of the stem section of Fig. 14, this is readily accomplished by interposing a suitable nipple, as for example the nipple shown at the top of Fig. 3. This nipple consists of an insulator threaded for its entire length and having portions of its thread formed by contact rings 11 disposed respectively at the ends of the threaded nipple and connected to each other by a wire imbedded in the insulation. The nipple also has part of its thread formed upon a centrally mounted metal ring 26 of substantially double the width of the rings 11 and spaced from each other by double the distance between the threaded terminal portions of Fig. 6, or the corresponding contacts 11 and 12 of Fig. 13. That is to say, the single ring 26 in this case forms counterpart of two of the rings of one of the other sections.

With the nipple as described, connection is readily made from the link terminal section 28 of Fig. 1 to the body section 29 of the same figure. This body section, made chiefly from insulating material or with its conducting parts properly insulated from each other, is equipped at its upper end with a female-threaded recess including contact rings 4 and 5, Fig. 3, affording the upper terminals for conductors imbedded in the insulating body, which body is here shown substantially six-sided and as equipped along the middle of its height with an attachment recess in each of these sides. These recesses are all threaded similarly to the recess at the upper end and are all similarly equipped with contact rings all connected to the said rings 4 and 5 at the upper end of the holder section by conductors imbedded in the insulation. Each of these latter female bores therefore affords ready means for attaching any other fixture section having a thread after the manner of Figs. 13 or 14. In the present instance, I employ alternate openings for holder plugs to support the arms of a holder for light-controlling device, and for sockets carrying miniature lamps, such as the socket shown detached at the right hand of Fig. 3. For the holder purpose, I employ a stud 30 hav-

ing a male thread to screw into one of the said standard female bores and having a female thread for receiving a screw 31 extending through a perforation in the upper portion 32 of an arm of the holder. Each of the arms desirably terminates at its free end in a hook underhanging a rim of the light-controlling device used with the fixture, such as the bowl 33, these arms desirably being made of resilient material so that they may be sprung out of engagement with the rim of the bowl. To accommodate different diameters of bowls or other light-controlling devices, I preferably make the holder arms adjustable in length, as by providing two arm sections 32 and 33 secured to each other by clamps 34. Each of the clamps 34 may consist simply of a sleeve encircling portions of both of the holder arm parts and fast upon one of the latter. For example, as shown in Fig. 4, the sleeve 34 may be attached by screw to the upper arm section 32, while the companion clamp in Fig. 3 would similarly be screwed to the lower arm section 33. Each screw, extending through the sleeve and one of the arm sections, is adapted to bear against the companion arm section, by such bearing clamping such companion sections in any desired position and effectually locking the two sections to each other. Upon slightly loosening the screws of both sleeves, the clamping action is relieved, and the arm sections can be telescoped along each other, thus providing any desirable holder diameter. That portion of either arm designed to telescope with the corresponding portion of the other, is formed on a straight line or on the arc of a circle.

The formation of the holder described above can be modified without departing from the spirit of my invention. Thus, instead of straps, the holder can be formed from two tubes or from a rod and a tube, the one telescoping with the other. Such type of holder arm 45 is shown in Fig. 5. The companion parts of the arm designed to telescope with each other, are formed straight or on the arc of a circle.

I have described above the attachment of a three-arm holder to three alternate lateral recesses of the body section shown in Fig. 3. Instead of miniature lamps as shown in Fig. 3, a second independent three-arm holder can be attached at the remaining lateral recesses. This permits the independent holding of a light-controlling device and of a housing or envelope for same, a construction which is desirable when the light-controlling device is not, in itself, of attractive appearance. Similarly, this construction permits of supporting a light-controlling device partially enveloping a second light-controlling device, a construction sometimes desirable when adequate light-control cannot be provided with such bending of the light rays as it is possible to produce by a single light-controlling device.

In the partial embodiment of my invention represented by Fig. 3, I provide not only a means for attachment of holder or other fixture parts, as heretofore described, but I provide also a means whereby an axially-disposed socket, attached to the body section either directly, or indirectly through intermediate sections, may be raised or lowered to bring the light-giving portion of the lamp into desired effective relation to the bowl or other light-controlling portion of the fixture. To this end, I connect the circuit terminal 4 at the upper end of the body section through an imbedded wire with the stem 35 having an enlarged and threaded end 36 thereon, while the other contact ring 5 is similarly connected to an imbedded cylinder 37 having a female thread of the same pitch as that on the head 36 of the said stem. Between this cylinder and the said stem I insert piston 38, primarily made of an insulating material, equipped at its lower end with the standard female bore of my sectional units and having part of its thread formed by contact ring portions 4^A and 5^A as shown at the lower end of Fig. 3. One of these contact rings is connected by a conductor (imbedded in the insulating material of piston 38) with an inner tube 39 constituting an integral part of the piston, which tube is (female) threaded and designed to engage with the head 36 of the stem 35. The other contact ring 5^A is similarly electrically connected to a ring 40 constituting an integral part of the piston, which ring is (male) threaded and designed to engage with the tube 37. It is evident that the piston 38 can be raised or lowered by rotating it, the while maintaining electrical connection between the contact ring 4 and the contact ring 4^A, and between the contact ring 5 and the contact ring 5^A. To expedite the proper aligning of these elements during the initial assembly of the same, I provide a longitudinal adjustment for the stem 35, as by threading this at its upper end into the conducting member which connects it to the circuit, and thereafter locking the stem against rotation when properly adjusted by means of the screw 41. In Fig. 3 I have shown these associated parts in the uppermost position but it will be evident that, by bodily rotating the piston 38, the threaded bore at the lower end of the piston can readily be lowered for a considerable distance without disturbing the electrical connections. This body section therefore provides means for adjustably positioning the light center in proper axial relation to the light-controlling device under wide variation as to lamp size and as to size and shape of light-controlling device.

The socket section of my invention introduces an element of novelty, as compared with the previous art of socket manufacture, in that this section, in common with the other sections of my invention, is provided with means whereby electrical connection to an adjacent section is automatically made incidental to the making of mechanical connection. As such means, I preferably employ an axial plug identical in type with that shown at the top of Fig. 14. This plug, which is preferably integral with the socket, is located at the end of the socket opposite that at which lamp connection is made. I preferably provide a suitable thread on the exterior of the socket at the lamp connection end as shown in Fig. 1 and Fig. 35, such threaded end of socket serving as a mechanical means for attachment of a light-controlling device holder. This has its special application to use in certain fixtures, such as for residence dining-room service, where it is desirable to use a relatively small light-controlling device in a large ornamental dome. The small light-controlling device may conveniently be supported by holder attached to the socket, the large dome being supported by holder attached to the body, as heretofore described.

While I comply with the statute requirements of illustrating and describing certain desirable embodiments of my invention, I do not wish to be limted to the construction here disclosed, as the same might obviously be modified in many ways without departing from the spirit of my invention. For example, Fig. 5 shows a pendant fixture in which the terminal link section 28 is screwed upon a fluted stem section 44 supporting the holder arms 45 which are adjustably clamped to this stem by means of a sleeve 46 threaded upon the tapering upper ends of these arms, after the manner more fully described in my co-pending application #210844, filed January 8, 1918, on a light-controlling device holder. In this case, I provide relative adjustment between the lamp and the light-controlling device by moving the light-controlling device relative to the rest of the fixture, while in the device of Fig. 3 I accomplish the same result by holding the light-controlling device stationary with respect to the rest of the fixture and moving the lamp.

Moreover, it will be evident that wide variations in form and in the particular means provided for mechanical attachment and electrical contacting may be employed without departing from the spirit of my invention. Thus Fig. 21 shows an embodiment of my invention in which a variant contacting means is provided and in which two independent sets of electrical conductors are likewise provided. In this case, the contacting surfaces are segmented as shown on the face of the cubical portion of the link, bottom of Fig. 21. This two-circuit arrangement may sometimes be desirable where it is desired to operate a plurality of lamps carried by a single fixture, some on one circuit, some on another.

It is obvious that a multitude of other variations are possible, without departing from the spirit of my invention. Figs. 22 to 32, inclusive, present some of the more important of such variations, as applied to the link section. Thus Figs. 22 to 27, inclusive, show a construction in which the link is made of separable and counterpart halves, secured to each other by a bolt of insulating material, each half having embodied in it a conductor terminating in resilient contact fingers, more especially illustrated in Figs. 24, 26 and 27. Or, two-part links, clamping substantially ball-shaped intermediate members, may be employed as in Figs. 28 to 32, inclusive, in which case the balls desirably have webs 54, preventing such rocking as might cause one of the contacts 55, carried by a ball, to short circuit the two conductors. In this last construction, I employ a ring 56 for joining two link halves into a closed link section. The foregoing constitute but a selected few of the many embodiments of my invention which I have devised.

Figs. 19 and 20 are presented for the purpose of making more clear the nature of my invention in its adaptability to the manufacture, by a mere assembly of standard parts in different combinations, of fixtures of radically different character or type. Thus Fig. 19 shows a fixture in which stem sections instead of link sections support the fixture body. These stem sections are essentially identical with the construction shown in Fig. 14, and may be made with plain, fluted, or otherwise embellished exterior. Similar stem sections may be attached to the body section at the provided lateral attachment recesses, thus constituting fixture arms of any desired number and of any desired length. By terminating such fixture arm with the link attachment section of Fig. 13, a terminal link 28, or one or more links 27 and a terminal link, may be attached. To this, in turn, the socket may be attached, thus forming an arm-type fixture of the general character shown in Fig. 19. If desired, an axially-disposed socket, lamp and light-controlling device may also be attached to the axial recess at the bottom of the lamp body.

The adaptation of my invention to the construction of a direct-lighting fixture employing a single lamp and light-controlling device will be obvious from Fig. 1. In such case a direct reflector, instead of the indirect bowl of Fig. 1, may be employed supported by holder attached to the body section; or, the body section may be omitted entirely,

the socket being attached directly to terminal link section 28, and the light-controlling device supported by holder attached to the socket. Similar possibilities are evident if it be desired to employ rod sections 48 and 49 instead of the link sections.

Fig. 35 illustrates the construction when it is desired to support the body section by several supporting members rather than by a single support. In this case, the top-most link in each chain would be formed from two independent similar half-links, three-forked link attachment sections similar to 13 of Fig. 1 but forking into three distinct cubical portions, being provided, by means of which special link attachment section the supporting members would be connected to the terminal section.

Any recessed points of attachment, which are not desirably employed for any other purpose, would be closed by the attachment of the standard blind plug 51 which affords no corresponding contacting parts to the contacts 4 and 5 of the threaded recess.

Where a chain-supported type of fixture is desired, link sections as heretofore described may similarly be employed, as exemplified in Fig. 35, where a holder body 60 carries horizontally disposed link-attachment section 13 connected by a series of links 27 with a multiple-link-attachment section 61 having arms corresponding in number to the number of chains. Likewise, link sections and threaded stem sections may be employed in tandem with each other, as shown for example in Fig. 34, so that the interchangeable assembly of a relatively small number of my fixture sections permits of producing an extensive variety of sizes and types of fixtures.

I claim as my invention:

1. An electric lighting fixture, comprising sectional and interchangeably connectable fixture construction elements each comprising a body of insulating material having electric circuit conductors embedded therein, the conductors being exposed only at the end faces of the terminals when the elements are disconnected, and being entirely unexposed at the juncture of consecutive elements when the latter are interconnected.

2. In an electric light fixture, a fixture section therefor comprising a body of insulating material having a gap substantially equal in width to the thickness of another portion of the said body, and electric circuit conductors embedded in the insulating material and each presenting terminals having their end faces exposed respectively on the opposite sides of the last named body portion and on the opposed faces of the gap.

3. An electric light fixture, comprising mechanically interengageable sections each carrying electric circuit conductors having exposed end faces for direct electrical connection between adjacent sections by the mere mechanical connection thereto, each section having two portions adapted for engaging counterpart portions on other sections, the said two portions on each section being counterparts of each other.

4. An electric light fixture, comprising fixture sections carrying electric circuit conductors having end face surfaces and constructed for interchangeably affording simultaneous mechanical and electrical connections to one another by the mere interengaging thereof, including a section equipped for such interengaging with a plurality of other sections and for thereby affording multiple circuit connections to the latter.

5. In a sectional electric light fixture, a fixture section provided with an insulating body portion having a socket and a male threaded portion, a pair of terminals having their end faces respectively forming longitudinally spaced parts of the threaded portion, a pair of relatively insulated metal terminals having their end face portions disposed for engaging terminals on a lamp, and electric circuit conductors connecting the first named terminals with the last named terminals respectively.

6. Electric light fixture sections arranged for simultaneous mechanical and electrical connection to one another by the mere mechanical assembly thereof, including a socket-carrying section having means for relatively moving the socket-carrying portion with respect to the section supporting portion thereof while continuously and abuttingly maintaining the electric circuit connections to the socket.

7. For use in the construction of electric light fixtures, mechanically interengageable sections each equipped for affording direct electrical connection between the sections adjacent thereto by the mere mechanical connection thereof, each section having two spaced apart portions adapted for engaging counter-part portions on other sections, the said two portions on each section being counterparts of each other.

8. For use in connecting fixture sections having equivalent threaded bores including contact portions, a nipple threaded for substantially its entire length and comprising three metal contact rings and an insulating body carrying the same, two of the rings being at opposite sides of and spaced from the third ring, and means electrically connecting the said two rings.

9. For use in connecting fixture sections having equivalent threaded bores including end face contact portions, a nipple threaded and equipped at each end for affording direct mechanical and electrical connection between two such fixture sections by the mere

screwing of the ends of the nipple into the said bores of the two sections.

10. Electric light fixture sections each including both a part of the supporting structure of the fixture and a pair of enclosed electrical conductors, each section being arranged for simultaneous mechanical and electrical connection to other sections; the said sections including a variety of differently shaped and dimensioned sections having end portions interengageable with each other, whereby a great diversity of fixture types and of dimensional variations can be assembled from a limited variety of such sections.

Signed at Milwaukee, Wisconsin, February 3, 1919.

ARTHUR J. SWEET.