United States Patent [19]

Trowbridge

[11] **3,770,952**

[45] **Nov. 6, 1973**

[54] **LIGHTING FIXTURE HAVING FOLD-OUT LAMP SOCKETS**

[75] Inventor: **Charles A. Trowbridge,** Wrightstown, Pa.

[73] Assignee: **Sim-Kar Lighting Fixtures Co.,** Philadelphia, Pa.

[22] Filed: **Oct. 25, 1972**

[21] Appl. No.: **300,452**

[52] **U.S. Cl.** ..... **240/51.11 R,** 240/9 R

[51] **Int. Cl.** **H05b 33/02**

[58] **Field of Search** ..... 240/51.11 R, 9 R, 240/78; 339/52–56

[56] **References Cited**

UNITED STATES PATENTS

2,982,850	5/1961	Lister et al.	240/9 R X
3,070,689	12/1962	McIntosh	240/51.11 R
2,503,876	4/1950	Kruss	240/51.11 R

FOREIGN PATENTS OR APPLICATIONS

272,948	3/1966	Australia	240/51.11 R
655,573	1/1963	Canada	240/51.11 R

Primary Examiner—Richard L. Moses

Attorney—Dexter N. Shaw et al.

[57] **ABSTRACT**

A fluorescent lamp fixture is provided with fold-out lamp socket assemblies. The socket assemblies are mounted in the ends of a channel member to pivot outwardly from their nested shipping positions and into their extended positions for mounting a lamp therebetween. Each socket assembly is secured in its extended position by means of a latch, and an end plate is provided for insertion into each end of the channel member to close the same. A closure plate extends along and encloses the length of the channel member, and the ends of the closure plate are releasably secured to the socket assemblies by means of locking assemblies.

10 Claims, 12 Drawing Figures

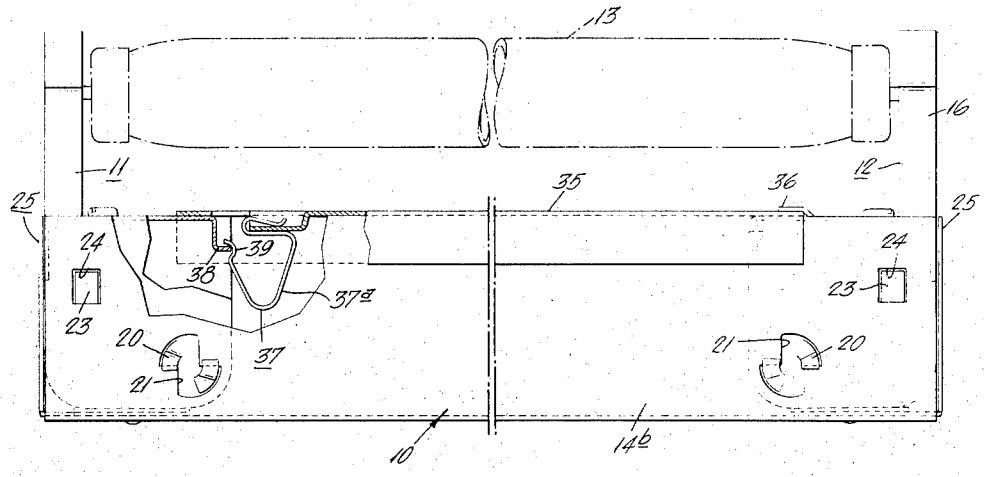


FIG. 2.

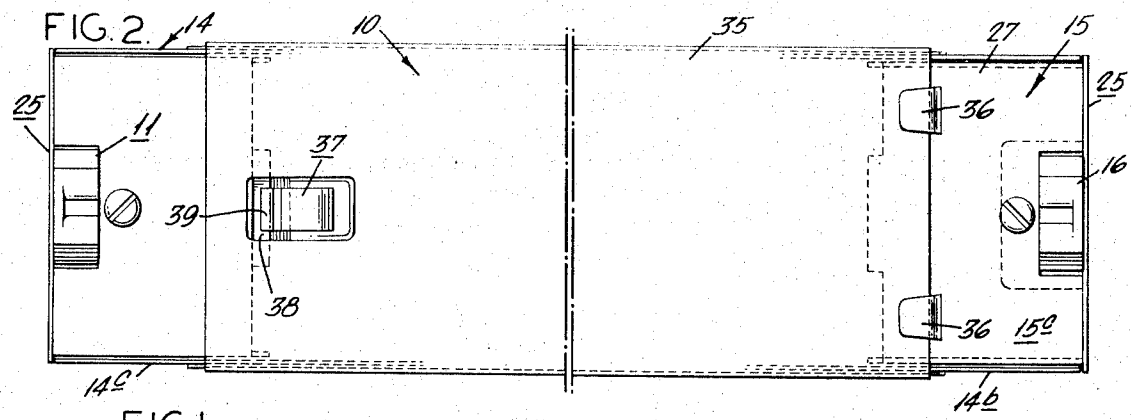


FIG. 1.

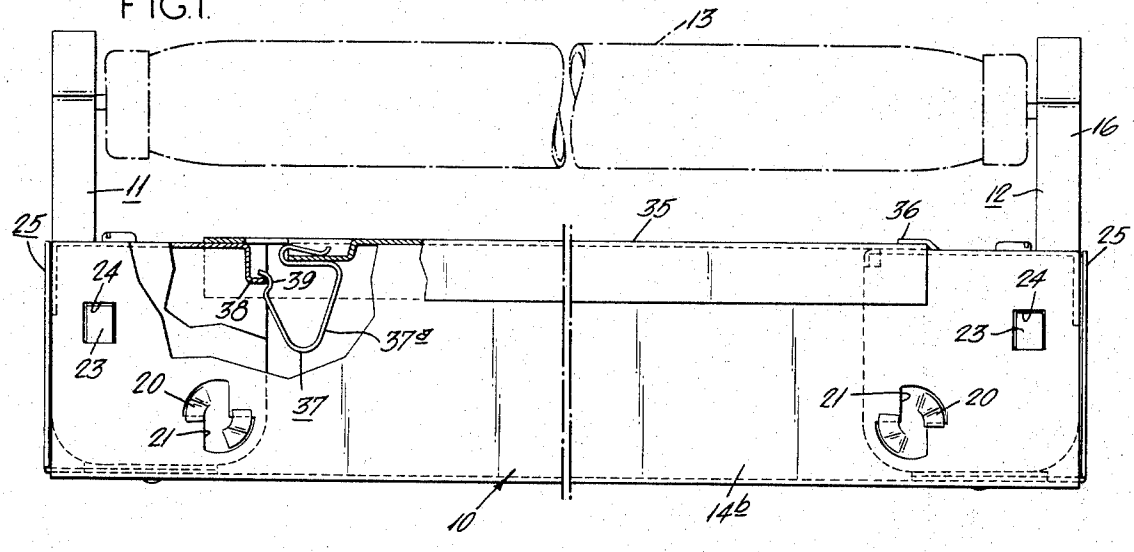


FIG. 3.

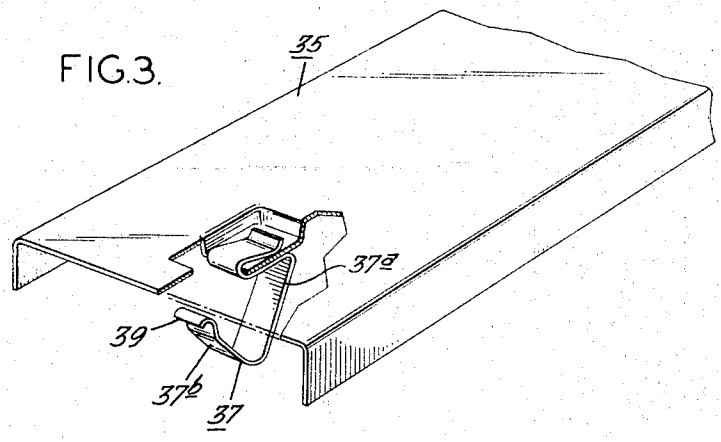


FIG. 5.

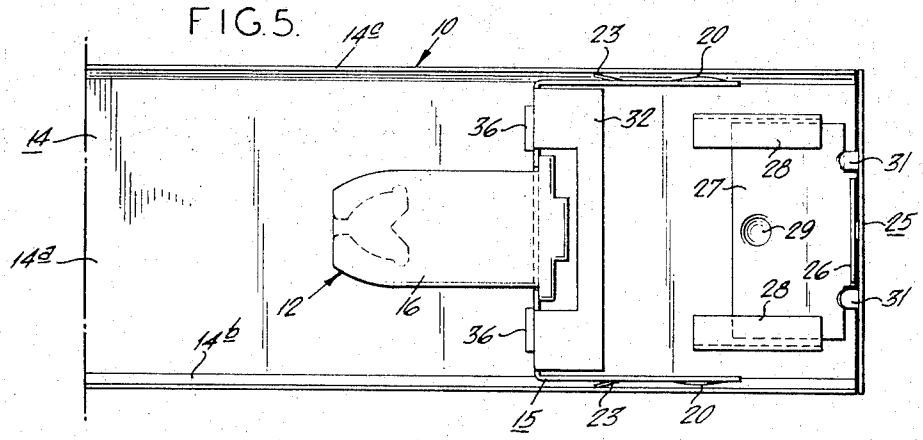


FIG. 4.

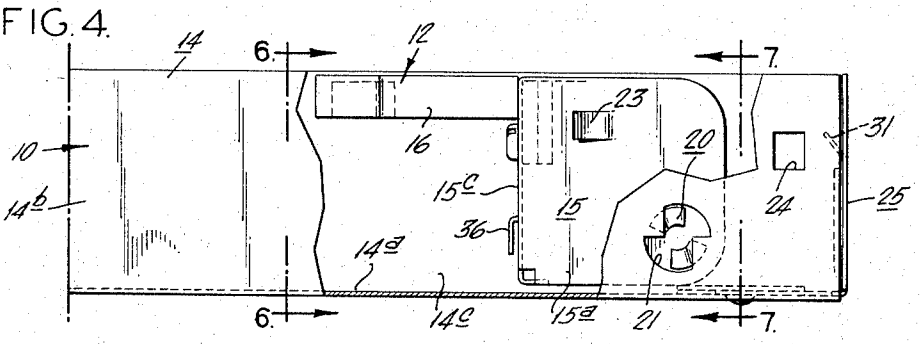


FIG. 6.

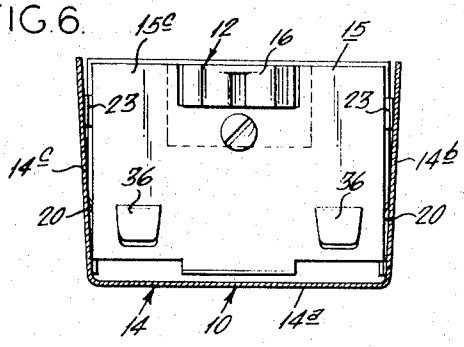


FIG. 7.

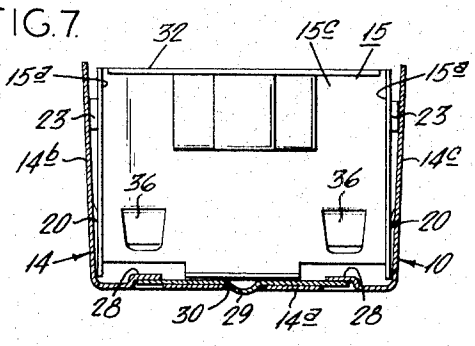


FIG. 9.

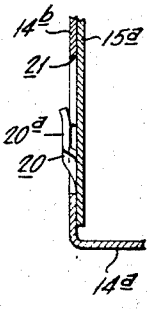


FIG. 10.

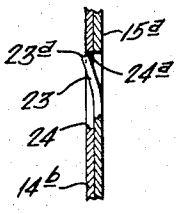


FIG. 8.

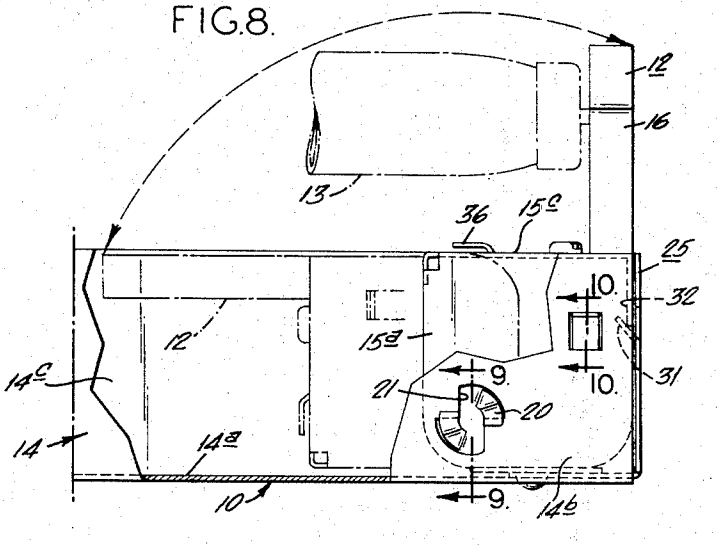


FIG. 12.

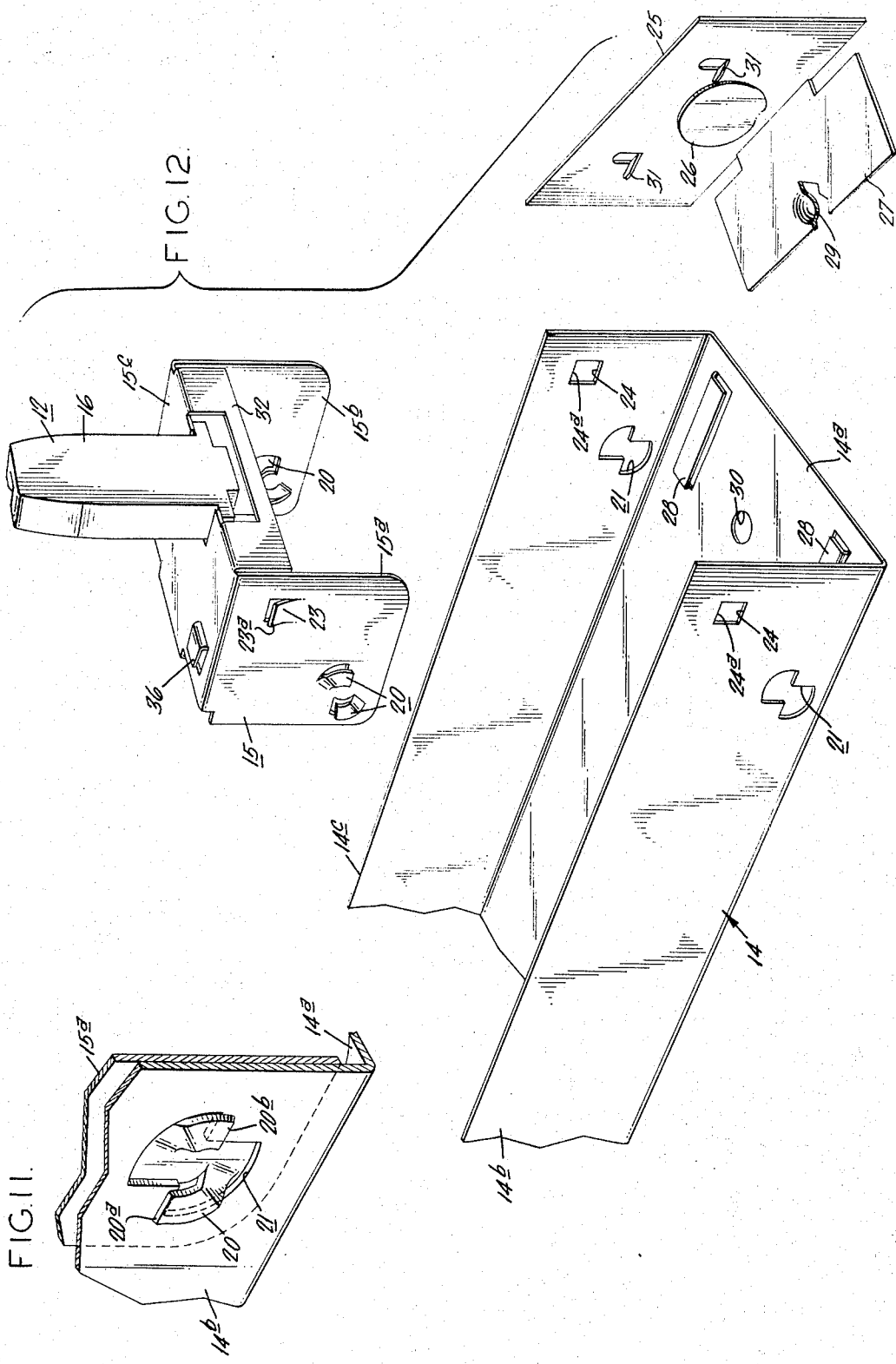

25
31
31
26
27
29
12
16
15c
32
15b
20
15a
23a
23
36
20
15
14a
24a
24
21
28
30
28
24a
24
21
14c
14
14b

FIG. 11.

15a
14a
20b
20a
20
21
14b

LIGHTING FIXTURE HAVING FOLD-OUT LAMP SOCKETS

The present invention relates to lighting fixtures, and more particularly, the present invention relates to lighting fixtures of the type which accept fluorescent lamps.

At present, fluorescent lamp fixtures for industrial, commerical and residential uses are shipped in cartons to electricians for installation. Conventional fixtures which accept straight, elongated lamps have lamp sockets which extend outwardly at right angles to the ends of the fixtures, and the lamp sockets are usually constructed of an insulation material which is relatively brittle. As a result, there is a tendency for the sockets to break when subjected to rough handling, such as encountered during shipment to the place of installation. In addition to the economic loss occasioned by breakage of the sockets, the carton in which the conventional fixture is shipped must be sufficiently large to contain the fixtures with the protruding lamp sockets. A fixture which would be capable of being shipped in a relatively compact carton is highly desirable, not only because the cost of the carton would be reduced, but also because the fixtures could be packed more densely and hence shipped more economically. Furthermore, a fixture which is of simple but rugged construction and which is capable of being assembled rapidly by relatively unskilled persons and set-up rapidly by electricians at the installation site is also highly desirable.

With the foregoing in mind, it is a primary object of the present invention to provide a novel fluorescent lamp fixture having lamp sockets which are capable of being nested within the body of the fixture during shipment to reduce the possibility of the sockets being damaged in shipment.

It is another major object of the present invention to provide an improvement fluorescent lamp fixture having fold-out lamp sockets which enable the fixture to be shipped in a compact carton.

As another object, the present invention provides a unique fluorescent lamp fixture having fold-out lamp sockets which enable economies to be realized in the shipment of the fixtures.

It is a further object of the present invention to provide a simple but rugged fluorescent lamp fixture which is capable of being assembled in a rapid manner by relatively unskilled persons.

As a still further object, the present invention provides a fluorescent lamp fixture which is capable of being set-up expeditiously by skilled electricians so as to effect installation economies.

More specifically, the present invention provides a lighting fixture having a channel member and lamp socket assemblies which are capable of being folded out from the ends of the channel member at the installation site to enable the fixture to be shipped in a compact carton while eliminating potential damage to the lamp sockets in shipment. The channel member has a web with upstanding sides, and each socket assembly has a base mounted between the sides of the channel member and a lamp receptacle extending from the base. Each socket assembly is secured in its extended lamp-mounting position by means of a latch. A removable end plate is provided for closing each end of the channel member and for providing a back-up for the lower portion of the lamp receptacle to lock the lamp receptacle in the fixture. A closure plate is provided for enclosing the channel along its length. The closure

plate is releasably fastened at its ends by means of locking assemblies associated with the socket assemblies. The fixtures are shipped with the sockets disposed within the channel; however, the socket assemblies are extended for mounting a lamp when they are pivoted outwardly upon removal of the fixture from the shipping carton at the installation site.

These and other objects, features and advantages of the present invention should become apparent from the following description when taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a foreshortened side elevational view of a fluorescent lamp fixture embodying the present invention;

FIG. 2 is a plan view of the fixture of FIG. 1 but with the lamp removed;

FIG. 3 is an enlarged fragmentary perspective view of a means for releasably fastening a cover plate of the fixture;

FIG. 4 is a side elevational view of the right-hand portion of the fixture of FIG. 1 with portions broken away to expose a lamp socket assembly disposed in its nested or shipping position;

FIG. 5 is a plan view of the portion of the fixture illustrated in FIG. 4;

FIGS. 6 and 7 are sectional views taken along lines 6—6 and 7—7, respectively, of FIG. 4;

FIG. 8 is a view similar to FIG. 4 but illustrating in full lines a lamp socket assembly in its extended position and illustrating in broken lines the lamp socket assembly in its shipping position;

FIGS. 9 and 10 are enlarged fragmentary sectional views taken along lines 9—9 and 10—10, respectively, of FIG. 8;

FIG. 11 is a greatly enlarged fragmentary perspective view of a preferred means for pivotally mounting each socket assembly in the fixture; and

FIG. 12 is an exploded perspective view of an end portion of the fixture of the present invention, the view illustrating a channel member, a socket assembly and an end closure plate.

Referring now to the drawings, there is illustrated in FIG. 1 a lighting fixture 10 which embodies the present invention. As illustrated therein, the fixture 10 has a pair of socket assemblies 11 and 12 provided at opposite ends of the fixture for mounting therebetween a straight fluorescent lamp 13 (illustrated in broken lines). Although the lamp socket assemblies 11 and 12 in the illustrated fixture are located at the ends of the fixture, it should be apparent that socket assemblies may be mounted back to back near the center of the fixture to permit shorter lamps to be utilized or to permit manufacture of longer fixtures. Moreover, it should be apparent that the present invention is applicable to fixtures which mount a plurality of fluorescent lamps in parallel relation.

According to the present invention, the fixture 10 is capable of being disposed in a compact configuration which also protects the socket assemblies 11 and 12 from being damaged in shipment. To this end, the body of the fixture 10 is provided by a channel member 14, and the socket assemblies 11 and 12 are mounted to pivot between a nested shipping position within the channel member 14 as illustrated in FIG. 4 and an extended, lamp-mounting or usage position illustrated in FIG. 1.

In the illustrated embodiment, the channel member **14** is U-shaped and has a web **14***a* and parallel upstanding sides **14***b* and **14***c*. Each socket assembly, such as the right hand assembly **12**, has a base **15**, and a lamp receptacle or socket **16** extending away from the base **15**. As best seen in FIG. **12**, the base **15** has a pair of downturned legs **15***a* and **15***b* which are mounted between the sides **14***b* and **14***c* of the channel **14**. The legs **15***a* and **15***b* are interconnected by an integral support portion **15***c* which mounts the lamp receptacle **16**.

In order to permit the socket assemblies **11** and **12** to fold into and out of the channel member **14**, there is provided means to pivotally connect the base **15** of each socket assembly to the sides **14***b* and **14***c* of the channel **14**. Preferably, the pivotal connection is provided by means of a protrusion on each leg of the base **15**, such as the protrusion **20** on the leg **15***a* and means **21** in the leg **14***b* adjacent the web **14***a* for receiving the protrusion **20**. In the illustrated embodiment, the protrusion is provided by means of a pair of curved leaves **20***a* and **20***b* struck outwardly from the leg **15***a*. The protrusion-receiving means includes an aperture **21** which is shaped at diametrical locations to permit the leaves to be displaced axially through the aperture and which is shaped at other diametrical locations to prevent the leaves from being displaced axially when the receptacle **16** is extended. For instance, see FIGS. **9** and **11** wherein there is illustrated the interlocking engagement of the leaves **20***a* and **20***b* with the side **14**b of the channel member when the receptacle **16** is extended. With this structure, it is impossible for either of the socket assemblies **11** or **12** to disengage the channel member **14** when in their extended, lamp-mounting positions.

For the purpose of securing the socket assemblies **11** and **12** against inadvertent nesting or folding, there is provided means to latch each of the socket assemblies **11** and **12** in their extended positions. In the illustrated embodiment, the latching means permits the socket assemblies **11** and **12** to pivot clockwise from their nested positions while preventing them from pivoting in the opposite direction from their extended positions. As best seen in FIGS. **8** and **10**, the latching function is provided by means of a pair of ears such as the ear **23** struck outwardly from the base-leg **15***a* and a pair of rectangular apertures such as the aperture **24** provided in the side **14***b* of the channel member **14**. Each ear **23** and aperture **24** has edges **23***a* and **24***a*, respectively, which engage one another when the ear registers in the aperture **24**. It is noted that the ear **23** tapers outwardly and upwardly from its point of connection with the leg **14***b* and the leg **14***b* is somewhat elastic so that when the socket assembly **12** is pivoted clockwise, the ear **23** maintains the sides **14***b* and **14***c* spread apart slightly as illustrated in FIGS. **6** and **7** until the ears **23** register in the apertures **24** and the sides **14***b* and **14***c* spring inwardly against the legs **15***a* and **15***b* of the base **15** of the socket assembly **12**. As best seen in FIGS. **1** and **8**, the ear **23** is located between the pivot axis of the base member **15** and the adjacent end of the channel member **14**, and the point of connection of the ear **23** and the leg **14***b* is located between the edge **23***a* of the ear **23** and the web of the channel member **14**. As a result, it is impossible for the socket assembly **12** to be pivoted in the opposite or counterclockwise direction unless the sides **14***b* and **14***c* are spread apart to disengage the edges **23***a* and **24***a*. Thus, inadvertent nesting is prevented.

The ends of the channel member **14** are closed in use. For this purpose, a removable end plate **25** is provided for each end of the channel member **14**. As best seen in FIG. **12**, the end plate **25** has a central knockout **26** and a lower extension **27**. The end plate **25** is secured in position by means of a pair of parallel guides **28,28** which are struck upwardly from the web **14***a* and which slidably receive therebetween the lower extension **27**. Detent means in the form of a downwardly-dished dimple **29** in the lower extension **27** mates with a circular aperture **30** in the web **14***a*. Thus, the end plate **25** may be inserted into and withdrawn from the end of the channel member **14** upon inward and outward displacement axial of the channel member.

It is noted that the upper portion of the end plate **25** is secured to the socket assembly **12** by means of a pair of upstruck fingers **31,31** which receive a downturned flange **32** on the socket assembly **12** when the socket assembly is in its extended position. For example, see FIG. **8**. With this structure, the end plate **25** is securely fastened to the base **15** of the socket assembly **12** when the end plate **25** is inserted and the socket assembly **12** is pivoted into its fully-extended position. It is noted that the lamp receptacle **16** is normally slid into position on the base **15**. Thus, when the socket assembly **12** is pivoted and the end plate **25** locked in place, the receptacle **16** is also locked in place in the fixture **10** by being prevented from moving lengthwise of the fixture **10**.

The channel **14** is enclosed along its length. To this end, a channel-shaped cover plate **35** is provided and there is provided means to releasably fasten the ends of the cover plate **35** adjacent the ends of the channel **14**. As best seen in FIGS. **1** and **3**, the right-hand end of the cover plate **35** is fastened to the right hand socket assembly **12** by means of a pair of upstruck tongues **36,36** (FIG. **2**) on the support portion **15***c* of the base **15** of the socket assembly **12**. The other or left hand end of the cover plate **35** is releasably fastened to the left-hand socket assembly **11** by means of a keeper assembly which includes a V-shaped spring member **37** (FIG. **3**) having one leg **37***a* pressed onto a downward offset in the left end of the cover plate **35** and another leg **37***b* having a free end with a bight **39** for engaging a downwardly offset ledge **38** on the support portion of the left socket assembly **11**. Thus, when the cover plate **35** is displaced downwardly relative to the socket assembly **11**, the leg **37***b* of the spring member **37** deflects rightward before its bight **39** snaps onto the ledge **38**. Of course, the right end of the cover plate **35** is inserted under the tongues **36,36** before the left end is fastened.

In manufacturing the fixture **10**, the socket assemblies **11** and **12** are displaced downwardly into the positions illustrated in FIG. **4** until each protrusion **20** registers in its aperture **21**. The sides **14***b* and **14***c* of the channel member are thereby spread apart slightly as illustrated in FIGS. **6** and **7**. The end plate **25** is then installed by sliding its lower extension **27** between the guides **28,28** until the dimples **29** engages in the aperture **30**. The fixture **10** is then packed in a carton which is sized to receive the fixture **10** and its cover plate **35**.

The fixture **10** is ready for installation by an electrician when it is removed from its shipping carton and the socket assemblies **11** and **12** are pivoted outwardly about their pivot axes into the lamp-mounting positions

illustrated in FIGS. 1 and 8. The leaves 20*a* and 20*b* interengages the sides 14*b* and 14*c* of the channel member 14 to securely fasten each socket assembly in the channel member 14, and each ear 23 engages in the associated aperture 24 to latch the socket assemblies in their extended positions. The flange 32 on the base 15 of each socket assembly also engages the fingers 31,31 on the end plate to secure the end plate 25 in position. The cover plate 35 is installed as described above after the fixture is installed.

In view of the foregoing, it should be apparent that there has now been provided an improved lighting fixture which has fold-out fluorescent lamp sockets. The fold-out sockets are nested within the fixture for shipment in a protected manner in a compact carton.

While a preferred embodiment of the present invention has been described in detail, various alterations, modifications and changes may be made without departing from the spirt and scope of the present invention as defined in the appended claims.

I claim:

1. In a lighting fixture having a channel member with a web and upstanding sides and a pair of socket assemblies carried at spaced locations for removably mounting a lamp therebetween, the improvement wherein each of said socket assemblies includes a base member mounted to said channel member and a lamp receptacle extending outwardly from said base member, said base member having a pair of downturned legs disposed alongside the channel member, means providing a pivot connection between said base member and said channel member adjacent said web to permit said socket assembly to be disposed in a compact shipping position with said receptacle stowed parallel to the challel member and to permit the socket assembly to be disposed in a usage position with said receptacle extended at an angle to the channel member, said pivot connection including a pair of curved outstruck leaves protruding from one of said members and apertures in the other of said members for receiving said leaves, said apertures being aligned and sized at diametrical locations to pass said leaves axially and sized at other diametrical locations to prevent axial displacement of said leaves relative to said sides when said receptacle is extended.

2. Apparatus according to claim 1 wherein said downturned legs are disposed between the sides of the channel member, and said leaves are struck from said base member and said apertures are in said channel member.

3. In a lighting fixture having a channel member with a web and upstanding sides and a pair of socket assemblies carried at spaced locations for removably mounting a lamp therebetween, the improvement wherein each of said socket assemblies includes a base member mounted to said channel member and a lamp receptacle extending outwardly from said base member, means providing a pivot connection between said base member and said channel member to permit said socket assembly to be disposed in a compact shipping position with said receptacle stowed parallel to the channel member and to permit the socket assembly to be disposed in a usage position with said receptacle extended at an angle to the channel member, latch means cooperating with said channel member and said base member to permit said base member to pivot in one direction about its pivot axis for extending the receptacle while preventing said base member from pivoting in the other direction when said receptacle is fully extended, said latch means including a pair of ears struck from one of said members, and a pair of apertures in the other of said members, said ears and apertures having edges interengaging one another when said receptacle is fully extended and said ears register in said apertures.

4. Apparatus according to claim 3 wherein said ears are struck from said base member and said apertures are in said channel member.

5. In a lighting fixture having a channel member with a web and upstanding sides and a pair of socket assemblies carried at spaced locations for removably mounting a lamp therebetween, the improvement wherein each of said socket assemblies includes a base member mounted to said channel member and a lamp receptacle extending outwardly from said base member, means providing a pivot connection between said base member and said channel member to permit said socket assembly to be disposed in a compact shipping position with said receptacle stowed parallel to the channel member and to permit the socket assembly to be disposed in a usage position with said receptacle extended at an angle to the channel member, a removable end plate slidable axially into each end of said channel member, and means releasably fastening each end plate to said channel member, said end plate fastending means including a pair of spaced guides provided in said web adjacent said sides, a lower extension on said end plate slidable between said guides, and detent means on said lower extension and web cooperating to maintain said end plate in position at the end of the channel member.

6. Apparatus according to claim 5 including means on said base and said end plate cooperating to fasten said end plate to said base when said base is pivoted and said receptacle extended.

7. Apparatus according to claim 6 wherein said base to end plate fastening means includes a downturned flange on said base and upstruck finger means on said end plate for engaging said flange.

8. A lighting fixture having a channel member with a web and upstanding sides, an end plate disposed transversely to said channel member, and a pair of socket assemblies carried at opposite ends of said channel member for removably mounting a lamp therebetween, each of said socket assemblies including a base member mounted to said channel member and a lamp receptacle extending outwardly from said base member, means providing a pivot connection between said base member and said channel member to permit said socket assembly to be disposed in a compact shipping position with said receptacle stowed parallel to the channel member and to permit the socket assembly to be disposed in a usage position with said receptacle extended at an angle to the channel member, latch means cooperating with said channel member and said base member to permit said base member to pivot in one direction about its pivot axis for extending the receptacle while preventing said base member from pivoting in the other direction when said receptacle is fully extended, means providing a flange on each socket assembly for engaging its associated end plate in abutting relation when said socket is extended, and finger means carried on each end plate for engaging said flange to prevent displacement of said end plate axially of said channel

member when said socket assembly is extended and latched.

9. A lighting fixture having a channel member with a web and upstanding sides and a pair of socket assemblies carried adjacent the ends of the channel member for removably mounting a lamp therebetween, each of said socket assemblies including a base member mounted to said channel member and a lamp receptacle extending outwardly from said base member, said base member having a pair of downturned legs disposed alongside the channel member, means providing a pivot connection between said base member and said channel member adjacent said web to permit said socket assembly to be disposed in a compact shipping position with said receptacle stowed parallel to the channel member and to permit the socket assembly to be disposed in a usage position with said receptacle extended at an angle to the channel member, latch means cooperating with said channel member and said base member to permit said base member to pivot in one direction about its pivot axis for extending the receptacle while preventing said base member from pivoting in the other direction when said receptacle is fully extended, said latch means including an ear struck from one of said members and an aperture in the other of said members for receiving said ear, said ear and said aperture having interengaging edges located between the pivot axis of said base member and the adjacent end of said channel member with said ear being connected to its member between its edge and the channel web, so that when the edge of said ear engages the edge of said aperture, the base member is secured at two spaced locations against movement transversely of the channel member.

10. A lighting fixture having a channel member with a web and upstanding sides and a pair of socket assemblies carried at spaced locations for removably mounting a lamp therebetween, each of said socket assemblies including a base member mounted to said channel member and a lamp receptacle extending outwardly from said base member, said base member having a pair of downturned legs disposed alongside the channel member, means providing a pivot connection between said base member and said channel member adjacent said web to permit said socket assembly to be disposed in a compact shipping position with said receptacle stowed parallel to the channel member and to permit the socket assembly to be disposed in a usage position with said receptacle extended at an angle to the channel member, said pivot connection including a pair of curved outstruck leaves protruding from one of said members and an aperture in the other of said members for receiving said leaves, said one member having portions extending into said aperture and engaged between said leaves and the member from which the leaves are struck when said base is disposed with the socket assembly in its extended usage position.

* * * * *