June 27, 1939. F. W. WATERMAN, JR 2,164,264

SPRING CLIP

Filed Oct. 10, 1938

FIG. 1.

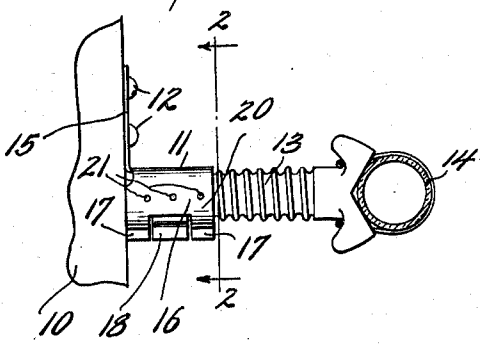


FIG. 2.

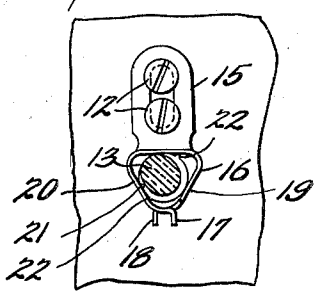


FIG. 3.

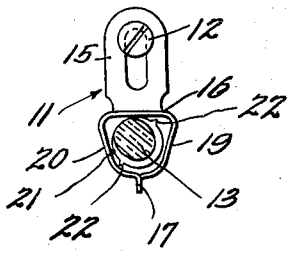


FIG. 4.

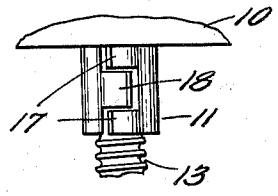
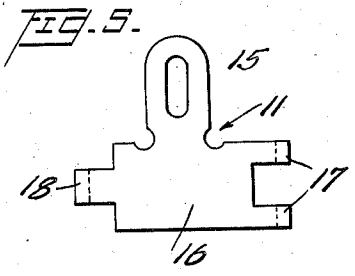


FIG. 5.



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2,164,264

UNITED STATES PATENT OFFICE

2,164,264

SPRING CLIP

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Application October 10, 1938, Serial No. 234,254

1 Claim. (Cl. 248—50)

This invention relates to resilient clamping devices, and more particularly to a spring clip adapted to detachably support a stem or rod which in turn is intended to support a neon tube or other article. Spring clips of this general character are well known, one such clip being described and illustrated in United States Patent No. 1,998,296 granted to Edward J. Walker. However, the spring clips of the prior art possess certain disadvantages, and it is the general object of the present invention to provide an improved clip which overcomes the disadvantages of the prior art constructions.

The spring clips heretofore known and used for the purpose here involved have, in general, empoyed a substantially cylindrical resilient split clamping member, intended to embrace and retain a cylindrical rod or stem, to the opposite end of which the neon tube or article is to be secured. Such spring clips, as well as the glass or porcelain rods or stems employed with them are manufactured and used in large quantities and at the minimum possible cost. Consequently, as a result of the methods of manufacture employed, and also of the wearing of the dies and molds, and of the non-uniform contraction of the glass or porcelain rods in cooling, irregularities occur both in the clips and in the rods which prevent the cylindrical clamping portion of the clip from accurately engaging the circumference of the rod. For example, as in the case of many molded glass articles manufactured cheaply and in large quantities, the rods are frequently found to have laterally projecting fins corresponding to the line of separation of the mold parts which, of course, renders the surface of the rods non-uniform. When such a rod is inserted in a cylindrical clamp, it is apparent that it will be engaged only along two lines, corresponding to the opposed fins or projections above referred to. One object of the present invention is to provide a spring clip having a clamping portion of a roughly triangular shape, which insures a three-line engagement between the clip and the rod regardless of irregularities in the manufacture of either or both.

Another disadvantage of most of the prior art clips is that a screw driver or other prying tool must be used in order to spread the two parts of the clamp portion in order to insert the rod to be gripped. This disadvantage has been partially overcome in the case of the clip described and illustrated in the above mentioned United States patent to Walker. However, the means provided for expanding the clip of the present invention constitutes an improvemet over the Walker device for reasons which will be hereinafter stated.

A further object of the present invention is the provision of a device of the character described which may be most economically manufactured and which is capable of expansion, for the purpose of inserting or withdrawing a rod, with a minimum of effort and without danger of permanent deformation.

Other and further objects, features and advantages of the present invention will be apparent to one skilled in the art from the following description taken in connection with the accompanying drawing in which

Figure 1 is a side elevation of a spring clip according to the present invention, with a neon tube supporting rod secured therein;

Figure 2 is a vertical section on line 2—2 of Figure 1;

Figure 3 is a view similar to Figure 2 but showing the clamp portion of the clip in expanded condition;

Figure 4 is a fragmentary bottom view of the construction illustrated in Figure 1; and

Figure 5 is a plan view of the metal blank employed in forming a spring clip of the present invention.

In order to facilitate an understanding of the invention, reference is made to the embodiment thereof shown in the accompanying drawing and detailed descriptive language is employed. It will nevertheless be understood that no limitation of the invention is thereby intended and that various changes and alterations are contemplated such as would ordinarily occur to one skilled in the art to which the invention relates.

Referring to Figure 1 the numeral 10 designates a supporting body or member, which may be the background of a neon sign, or other surface to which a neon tube or other article is to be attached. The spring clip of the present invention, which is designated generally by the numeral 11, is secured to the supporting body 10 as by means of screws 12. A rod 13, preferably corrugated as shown, and preferably of glass, is resiliently secured in the clip 11, and the neon tube 14, or other article to be supported, is secured to the outer end of the rod 13 by means which are well known and which form no part of the present invention.

The spring clip 11 comprises a base portion 15, which is apertured to receive one or more screws 12 for the purpose of securing the clip to the supporting body, and an integral clamp portion 16, the axis of which is perpendicular to the plane of the base portion 15 and supporting body 10.

In its preferred form, the clamp portion 16 of the present invention comprises a resilient metal shell which is roughly triangular in cross section, and is split longitudinally at that apex which lies farthest from the base portion 15. One longitudinal edge of the shell 16 is provided with a spaced pair of projections 17 and the opposite edge is provided with a centrally disposed projection 18, which extends between and beyond the projections 17. The outer ends of the projections 17 and 18 are turned downwardly into substantially parallel planes, to provide pressure surfaces for engagement by the fingers and thumb in order to expand the clamp portion or shell 16, to permit insertion or withdrawal of a rod. Thus, by gripping the down turned portions of the projections 17 and 18, and pressing them toward a common plane, as illustrated in Figure 3, the two side portions 19 and 20 of the clamp 16 may be sprung outwardly, substantially about axes passing through their respective points of juncture with the base portion 15, to permit free insertion or withdrawal of a rod. Preferably, one of the side portions 19 and 20 of the shell 16 is provided with one or more small projections 21 extending inwardly, and adapted to engage in the grooves of the corrugated rod 13 to prevent its withdrawal except when the clamp is in expanded condition. These projections 21 may be formed by punching, as indicated in Figure 1, in the same operation by which the blank of Figure 5 is formed. Since the slot or recess formed between the projections 17 is open at its outer side, it is obvious that there is no limit, apart from the physical dimensions of the device, to the degree of expansion which may be effected, and the projection 18 may be moved wholly outside of the slot between the projections 17, if necessary. However, it is contemplated that that degree of expansion which may be achieved by pressing the down-turned portions 17 and 18 into a common plane, will be sufficient for the contemplated use of the device.

It will be obvious that the triangular clamp of the present invention will provide a three-line engagement with the rod 13 regardless of irregularities in the latter and also regardless of slight irregularities occurring in the manufacture of the clip. Thus, in Figure 2 there is illustrated a rod having small longitudinal fins 22 formed theron in the course of manufacture, and it will be noted that such fins do not interfere with the gripping of the rod by the clamp 16 as would be the case if the latter were cylindrical. Even if greater irregularities were present in the rod, the clamp would still be able to exert a three-line grip thereon, thus preventing oscillation of the rod in the clamp, and providing a generally more secure engagement between the rod and the clamp.

By virtue of the superior type of engagement secured by the use of the present clip, it is possible to manufacture the clip from lighter gauge metal than that heretofore used in the manufacture of such devices, which effects a saving in cost, and also renders permanent deformation of the clip less likely. Also, being made of lighter metal the clip is more easily expanded than those of the prior art and in this connection, the present clip possesses the advantage, over the prior art, of providing pressure surfaces which extend at right angles to the direction of their movement, facilitating the expansion of the clamp by gripping with the fingers.

Lastly, the spring clip of the present invention may be very economically produced because of the form of sheet metal blank employed in its manufacture. As seen in Figure 5, the projection 17 formed on one end of the rectangular portion of the blank, corresponds in shape but is slightly smaller than the recess between the projections 18 at the other end of the rectangular portion of the blank, and the projection 17 thus may be formed of the metal stamped out between the projections 18 of the preceding clip blank, without substantial waste of metal. The blank is then bent into shape, the projection 17 passing naturally into the space between the projections 18, there being no necessity of inserting a tongue through a closed slot as in the case of the aforementioned Walker construction. Preferably the points of juncture between the rectangular portion of the blank and the laterally projecting portion which comprises the base portion 15 of the finished clip, are relieved as shown in Figure 5, which facilitates bending of the blank into the form of the finished clip.

In the appended claim the expression "neon tube support" refers to a rod-like support such as that described and illustrated herein, adapted for the support of the transparent tubes commonly employed in connection with neon and other signs or devices of the luminous gas type.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

Means for securing a neon tube support to a supporting member, comprising an apertured base portion adapted to be secured to the supporting member, and a clamp portion integral therewith and having its axis perpendicular to said base portion, said clamp portion comprising an open-ended resilient split shell having a roughly triangular section in a plane parallel to said base portion adapted to grip said neon tube support at three spaced points, one longitudinal edge of said shell having a pair of spaced projections, the opposite edge of said shell having a centrally disposed projection adapted to extend between and beyond said spaced projections, each of said projections having an outwardly turned portion, said outwardly turned portions lying in approximately parallel planes, whereby said shell may be expanded by pressing said outwardly turned portions toward a common plane, said device being formed from a single piece of resilient sheet metal.

FRED W. WATERMAN, JR.