June 30, 1953 H. M. MANOOGIAN 2,643,901

CONNECTING MEANS FOR TUBULAR SECTIONS

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Fig. 2

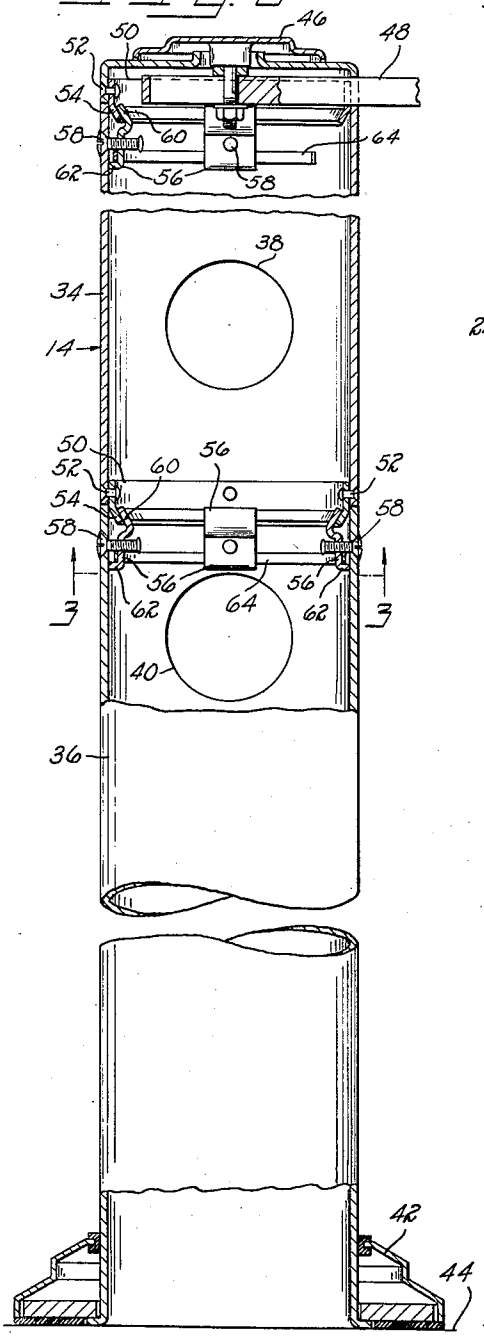


Fig. 1

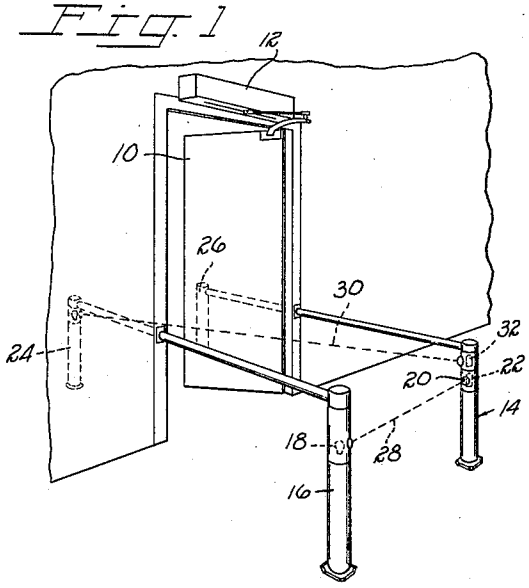
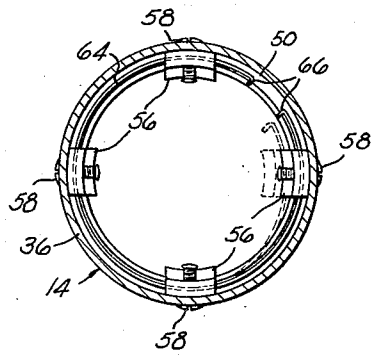


Fig. 3



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CONNECTING MEANS FOR TUBULAR SECTIONS

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3 Claims. (Cl. 285—197)

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This invention relates to door closing and opening apparatus of the character which is controlled by the interruption of a beam or beams of light, one example of an apparatus of this nature being illustrated in U. S. Patent No. 1,978,093, dated October 23, 1934. More particularly, this invention relates to a post construction used for adjustably supporting either a light source or a light sensitive unit used in connection with the aforementioned door closing and opening apparatus.

It is an object of the present invention to provide a post construction which will not only support suitable guide rails and the like, but also comprise sections or members which are arranged to contain either a light source or a light sensitive unit, and are provided with openings for transmitting light beams.

It is another object of the invention to provide coupling or connecting means for securing together various lengths of tubular units or members so that they may be either securely clamped against relative rotatable movement or adjusted relative to each other to permit the positioning of the light transmitting apertures in certain of the members so that said openings may be suitably adjusted relative to other similar posts in order that light rays may be transmitted between such posts.

It is a still further object of the invention to connect the tubular units or members by coupling means disposed on the interior of the members and only the heads of screws associated with the clamping or coupling means are visible on the exterior of the post members or sections, said screws being operable to either lock the various members in adjusted position relative to each other or, upon being loosened, said screws will disconnect the clamping means so that said post members may be adjusted relative to each other about the axis of the post.

Details of these objects and of the invention, as well as other objects thereof, are set forth in the following specification and illustrated in the accompanying drawing comprising a part thereof.

In the drawing—

Fig. 1 is a perspective view showing an exemplary illustration of a door closing and opening mechanism utilizing posts comprising the present invention.

Fig. 2 is a side elevation, partly in section and on a larger scale than in Fig. 1, of a post embodying the principles of the present invention.

Fig. 3 is a sectional plan view taken on the line 3—3 of Fig. 2 and showing in detail certain features of the present invention.

In Fig. 1, there is an exemplary illustration of a section of a wall containing a door frame

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and a door 10 which is opened and closed by mechanism contained in a casing 12, said mechanism being actuated pneumatically or otherwise. The actuation of the mechanism within casing 12 is controlled by photoelectric cell units mounted for example, within post 14. A similar post 16, spaced from post 14 so as to define a passageway between the posts, contains a light source such as a lamp 18. The post 16 is provided with a suitable opening through which a beam of light will pass from the lamp 18, and post 14 is provided with an opening 20 through which a beam of light from source 18 passes to a photo-electric cell unit 22 within post 14. If it is desired that the door 10 be actuated from either side, an additional pair of posts 24 and 26 may be provided on the opposite side of the door as shown in Fig. 1, and said posts will contain similar light transmitting apertures as well as light sources and photo-electric cell units.

In operation, a person or object passing between posts 14 and 16 will intersect the light ray or beam 28 passing between said posts and, as a result, relays and other mechanism normally used in connection with photo-electric cell units will be actuated to cause the door opening mechanism contained within casing 12 to operate so as to open the door 10. To insure that said door will remain open while a person or object is passing entirely through the open doorway, a so-called safety beam or ray 30 is arranged to shine diagonally across the passageway defined by the several posts described above. For example, the safety ray 30 will pass from a suitable light source in post 24 to an additional photo-electric cell unit 32 in post 14. As long as the safety ray is intercepted by an object or body passing through the doorway, the door 10 will remain open and will close only after the object or body has completely passed through the doorway.

To facilitate the ready installation of posts in an arrangement such as that illustrated in Fig. 1, as well as in a wide variety of other arrangements for automatically opening and closing doors by photo-electric cell type control means, posts similar to those illustrated in Figs. 1 and 2 have been devised, said posts being of a composite nature and comprising a plurality of cylindrical sleeves or tubular members or sections which are secured in end abutting relationship by clamping means which selectively will permit the sections to be fixed relative to each other in suitably adjusted positions or permit said sections to be adjusted relative to each other and then be actuated to clamp or lock the sections in desired adjusted positions relative to each other. Preferably, a reasonable number of tubular members or sleeves of similar

cross-sectional configuration but of different lengths are made available, said members being provided with clamping means comprising part of the present invention. Certain of said members or sleeves are provided with one or more apertures adapted to transmit light rays or beams. A cap member may also be attached to the top of a composite post to produce a pleasing finished appearance on the entire post. The lowermost tubular member is also provided with or is secured to an appropriate base by which the post may be anchored to a floor surface.

A specific example of a post embodying the principles of the present invention is shown in detail in Figs. 2 and 3. In Fig. 2 especially, several tubular members or sleeves 34 and 36 are secured in end abutting relationship. These members are respectively provided with apertures 38 and 40 through which light rays may be transmitted. The lower member 36 is secured to a suitable and preferably ornamental base 42 which may be attached to the floor surface 44 so that the post is rigidly supported at all times in a vertical position. A preferably ornamental cap member 46 is also secured to the upper end of topmost member 34. If desired, a hand or guide rail 48 of any desired length and shape may be secured to the cap 46 so as to extend therefrom horizontally or otherwise.

The several tubular members or sleeves of the post 14 shown in Fig. 2 are joined together and held in end abutting relation and axial alignment by securing means comprising an annular member 50 secured to the inner surface of one of the tubular members adjacent one end thereof. The member 50 may be secured to the tubular member in any suitable manner such as a plurality of countersunk rivets 52 and may be finished off on the exterior of the member so as to be substantially invisible. The member 50 is provided with an annular flange 54 extending somewhat inward into the interior of the tubular member and having an inner surface which extends away from the inner surface of the tubular member to which member 50 is attached.

Said inner surface of the flange, nearest the axis of the tubular member, comprises an undercut locking surface arranged to be engaged by a plurality of clamps 56 which are secured to and circumferentially spaced around the inner surface of an adjoining tubular member which is disposed in end abutting relationship to the member to which annular member 50 is secured. Each of the clamps 56 is secured to the inner surface of one of the tubular members adjacent the end thereof by a screw 58 which passes through a suitable aperture in the tubular member and the head of the screw is preferably countersunk into the exterior surface thereof so that the composite part has a pleasing exterior appearance.

The screws 58 engage the clamps 56 intermediate the ends thereof. Each clamp comprises a clamping end 60 having a surface which is complementary to the undercut surface of the flange 54 of the annular member 50. The other end of each clamp is bent substantially at right angles thereto to comprise a tail 62 which is spaced from the screw 58. When the clamps are in clamping position, the free end of the tail of each clamp directly engages the inner surface of the tubular member to which the clamp is attached. Said tail serves as a fulcrum for the clamp and when the screw 58 is tightened relative to each clamp the clamping end 60 of each clamp will engage the undercut surface of the flange 54 to hold the end abutting tubular members axially aligned and in a desired angular position relative to each other and to which they have been adjusted by rotating one relative to the other about their common axis.

Any desired number of clamps 56 may be utilized. At least three should preferably be used, spaced evenly around the inner surface of the tubular member, whereby abutting members are readily axially aligned. In the specific illustration shown in Fig. 3, four such clamps are utilized. The number should be sufficient to not only hold the end abutting tubular members in axial alignment but also securely clamp the tubular members against rotation relative to each other after they have been adjusted to a desired position and in which position a light ray will pass in a desired direction through the apertures 38 and 40 in the various tubular members.

It will also be noted that annular flange 54 on the annular member 50 preferably extends a short distance beyond the end of the tubular member to which it is attached so that said flange will enter the end of an abutting tubular member and thus serve to at least initially guide the ends of the members into end abutting alignment. The clamps 56, if desired, may also be formed inexpensively from sheet metal of suitable thickness and shaped into the configuration shown in the drawings by a simple stamping operation.

It will readily be seen that due to the undercut surface on flange 54, the screws 58 may be loosened to slightly release the clamping ends 60 of each clamp from firm engagement with the flange 54, whereby the tubular members 34 and 36, for example, may be rotated angularly relative to each other about their common axis. Such function is desirable when necessary to orient or align the light transmitting apertures 38 of the posts relative to similar apertures in other nearby posts. After such adjustment has been effected, the screws 58 are tightened to move the clamping ends 60 of the clamps 56 into tight engagement with the undercut surface of the flange 54 so as to prevent any movement of the various tubular members of the posts relative to each other.

To insure that the clamps 56 will be retracted out of engagement with the flange 54 when the screws 58 are loosened, a curved spring 64, formed conveniently from wire, flat stock, or otherwise, is disposed so as to preferably extend between all the various clamps 56, said spring passing, for example, through the space in each clamp between the screw 58 and the tail 62. In order that the spring may freely expand and contract, the ends 66 thereof are somewhat spaced from each other and are preferably turned inward toward the center of the post as indicated in Figure 3. By passing through each clamp between the screw 58 and tail 62 thereof, the spring 64 also serves to maintain the clamps in aligned positions substantially parallel to each other.

When the tubular members or sleeves of each post are initially assembled, the screws 58 of the clamps are loosened sufficiently so that clamping end 60 of each clamp is moved away from the inner surface of the tubular member a distance sufficient to permit the flange 54 of the abutting tubular member to pass into the end of the first mentioned tubular member. Following this, the screws may be tightened sufficiently to move the clamping ends 60 of the clamps toward the annular flange 54 sufficiently to prevent separation

of the tubular members in axial direction but nevertheless permit relative angular adjustment between said members, about their axis, for the purposes described above. It will be seen that the spring 64 will always maintain the clamps 56 in their most retracted position permitted by the screws 58. If desired, after the clamps 56 have been attached to one end of the tubular members by at least partially threading the screws 58 into the clamps, the inner ends of the screws may be upset or peened so as to thereafter prevent accidental separation of the screws from the clamps.

It will also be seen that the means for securing the various tubular members or sleeves of the posts together are disposed within said members or sleeves but the securing means are operable from the exterior of the posts by means of a screw driver, for example, for manipulating the screws 58. A pleasing external appearance is thus provided on each of the posts and the means by which the clamps are manipulated are of such nature that the ordinary passerby may not manipulate the same, intentionally or otherwise, so as to disturb the settings of the various members or sleeves of the posts. The securing means for the sleeves are also rugged and durable so as to adequately withstand shocks to which the posts will be subjected during ordinary use. It will also be seen from Fig. 2 that the cap 46 may be secured to the upper end of the topmost tubular member of the post by securing means such as are used to secure together the various tubular members of the posts. While the present invention and especially the means for securing together the various tubular members or sleeves has been illustrated relative to a post for use with a door actuating mechanism controlled by one or more photo-electric cell units, it is conceivable that such securing means may be used to connect in end abutting relationship other tubular members or sleeves used in other situations and for other purposes without departing from the spirit of the present invention. The invention accordingly consists in the features of construction, combination of elements and arrangement of parts exemplified in the construction described hereinabove and illustrated in the accompanying drawing, and the scope of the application of the invention is indicated in the appended claims.

While the invention has been illustrated and described in its preferred embodiment and has included certain details, it should be understood that the invention is not to be limited to the precise details herein illustrated and described since the same may be carried out in other ways, falling within the scope of the invention as claimed.

I claim as my invention:

1. In a tubular post comprising two tubular straight wall sections of substantially equal diameter, means disposed interiorly of the post and adjustable from the exterior thereof for releasably securing the sections in end abutting relationship and with the sections in any rotated position relative to each other comprising an annular ring secured to the interior of one tubular section and having a portion extending axially therefrom adapted to be telescopically received in the abutting end of the other tubular section, said ring having an inwardly extending inclined shoulder converging toward the end of said one tubular member, a plurality of clamps spaced about the interior of the other tubular section adjacent its abutting end, each of said clamps having an inclined nose portion engageable with said shoulder when the sections are in end abutting relationship, means for retaining said clamps in axially aligned position, and screw means associated with each clamp extending through an opening in said other tubular section for moving the nose of the clamp radially of the post.

2. In a tubular post comprising two tubular straight wall sections of substantially equal diameter, means disposed interiorly of the post and adjustable from the exterior thereof for releasably securing the sections in end abutting relationship and with the sections in any rotated position relative to each other comprising an annular ring secured to the interior of one tubular section adjacent the abutting end thereof and having a portion extending axially therefrom adapted to be telescopically received in the abutting end of the other tubular section, said ring having an inwardly extending inclined shoulder converging toward the end of said one tubular member, a plurality of clamps spaced about the interior of the other tubular section adjacent its abutting end, each of said clamps having an inclined nose portion engageable with said shoulder when the sections are in end abutting relationship, means engaging said clamps to retain them in axially aligned position and operable to bias them away from said shoulder, and screw means associated with each clamp extending through an opening in said other tubular section for moving the nose of the lamp radially of the post.

3. In a tubular post comprising two tubular straight wall sections of substantially equal diameter, means disposed interiorly of the post and adjustable from the exterior thereof for releasably securing the sections in end abutting relationship and with the sections in any rotated position relative to each other comprising an annular ring secured to the interior of one tubular section adjacent the abutting end thereof and having a portion extending axially therefrom adapted to be telescopically received in the abutting end of the other tubular section, said ring having an inwardly extending inclined shoulder converging toward the end of said one tubular member, a plurality of clamps spaced about the interior of the other tubular section adjacent its abutting end, each of said clamps having an inclined nose portion engageable with said shoulder when the sections are in end abutting relationship and having a tail engageable with the interior of the said other section to form a pivot, screws operable from the exterior of said other section engaging the clamps intermediate the tail and nose thereof to pivot the clamps into shoulder engaging position, and a resilient ring disposed between the clamps and the tubular section biasing the clamps inwardly and also serving to hold the clamps in aligned position.

HAROLD M. MANOOGIAN.

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