STAIR RAIL MOUNTING POST WITH LIGHTING FIXTURES

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Filed Oct. 5, 1964, Ser. No. 401,524
6 Claims. (Cl. 52—28)

ABSTRACT OF THE DISCLOSURE

A building structure for a stair well including a hollow mounting post, lighting fixtures and hand rail mounted on the lighting post and conducting for the lighting fixtures mounted within the posts. The post is formed in part by a cap which is removable for access to its interior.

This invention relates to a post for mounting stair rails and light fixtures in a stairway of the multi-storied building.

The present practice of mounting light fixtures in stairways of apartment and office buildings and the like is laborious and expensive. The steps include installing a junction box to each floor and intermediate landing to which the light fixture will be attached; mounting conduit in the form of pipe vertically in the wall forming portion of the building; and connecting conduit horizontally between the vertical conduit and the boxes. The conduit is then encased in concrete and plastered in the usual manner. The process outlined above is repeated for each floor of the building. After all of the conduit is installed and covered with concrete, cable is snaked through the vertical and horizontal conduit to bring it out into the junction boxes. The fixture are wired in and attached to the boxes. Any time after installation that electrical repairs are required or a rewiring is necessary, the conductors must again be unburied through the vertical and horizontal sections of the conduit.

One objective of the invention has been to provide a structure which vastly simplifies the installation of electrical light fixtures as well as the maintenance of them and provides those light fixtures in a position where they are most useful; namely, in a position in which they throw the major portion of their light on the top and bottom steps of each flight while, of course, lighting the rest of the stairs.

The installation of stair rails is also expensive, a substantial portion of the cost of installing stair rails being derived from the labor required to effect their installation. The stair rails are normally mounted on two to four posts for each flight (from floor to landing or landing to floor) and each of those posts is anchored by two fasteners which requires drilling, tapping or placing of inserts into the concrete which forms the stairway. The installation of the inserts in the stair wall for mounting the posts and the attachment of post mounting brackets to those inserts must be done with considerable care for otherwise the posts will be misaligned and the stair rail will tend to have a warped nonuniform appearance. It is in this mounting of the posts to the stair well that much of the labor cost in installing the stair wall is involved.

It has been an objective of the invention to provide a rail mounting structure which greatly simplifies the installation of the stair rails. It is a further objective of this invention that this structure by which the mounting of the stair rails is simplified performs the functions of a mounting post for electrical light fixtures and of conduit for carrying the cable to the light fixtures.

More specifically, the invention comprises a hollow rail mounting post which is adapted to extend continuously from the bottom to the top floor of the building, that post carrying the conduit for the lighting fixtures, that post supporting the lighting fixtures and that post supporting the hand rails. In the preferred embodiment the transverse dimensions of the post are two inches by five inches, these dimensions being adapted to accommodate substantially all types of light fixtures and junction boxes. It is contemplated that the post would be used for a stair well which is approximately four to six inches wide, the stair well having two parallel mounting posts extending from the bottom of the stair well to its top, the posts being located at each end of the stair well. Each post requires only a single bolt at each floor to secure it to the stair well. Since no more mounting posts are required for the hand rails, it can be appreciated that the invention reduces the number of inserts and bolts applied to inserts by a factor of four to sixteen, depending upon the number of mounting posts of the usual type which are supplanted by the invention.

The combined effects of the four inch wide stair well and the mounting post at each end of the stair well eliminates the need for a continuous bend of the stair rails as it passes from one flight to the next in order to prevent people from falling into the stair well. This feature reduces the cost of forming the stair rails and permits the stair rail to be manufactured with less complicated bends which can economically be shipped without fear of damage in shipping.

As to the electrical features, it is obvious that the labor and materials costs of dropping cable down a straight tube (actually it can be laid into a U-shaped portion of the tube) of substantial internal dimension is a vast improvement over the present practice, particularly when the installation of the conduit for the cable is actually an incident of the installation of the stair rail posts. Further, the all metal construction of the posts eliminates the need for junction boxes and additional conduit.

As a still further feature of the invention, the post is extruded and grooves having slanted walls are formed in at least one internal surface of the post to provide screw threads to receive cable hangers, junction boxes, splicing blocks and the like.

As indicated by the foregoing, it has been an objective of the invention to provide for the installation of an attractive and superior rail and light fixture system at a cost comparable to a cheap inferior system installed by prior art methods and structures.

The several features of the invention will become more readily apparent from the following detailed description taken in conjunction with the accompanying drawings in which:

FIG. 1 is a diagrammatic vertical section taken through the stairs of a multi-storied building to illustrate stair rail construction.

FIG. 2 is a fragmentary elevational view of the invention.

FIG. 3 is a fragmentary disassembled perspective view of the invention.

The stairway is indicated generally at 10 and serves to interconnect a bottom floor 11 with succeeding upper floors 12 and 13. Flights of stairs 14 run from the floors to landings 15 and flights of stairs 16 run from the landings 15 to the floors. The space between the flights 14 and 16 is the stair well and preferably is about four to six inches wide. At each end of the stair well is a post 20 formed in accordance with the present invention. Where there is a considerable distance between two end posts 20, a central post 21 may optionally be used. Vertically spaced light fixtures 22 are mounted on the posts in such a position as to shine their light rays principally on the
upper and lower steps of each flight. These light fixtures are connected to cable which is housed within each column in the v-shaped manner which will be described below. The hand rails 23 are secured to the mounting posts 20, and 21 where necessary, the hand rails for the flights 16 being mounted on one side of the posts and the hand rails for the flight 14 being mounted on the other side of the mounting posts. Thus, the mounting posts 20 provide the sole support for the hand rails and it is not necessary to provide separate stair posts mounted on each flight of stairs.

The mounting posts 20 are secured at each floor level in the stair well by a single bolt. The post at the left, when viewed in FIG. 1, is secured by bolts 24 at each floor level. Similarly, the posts at the right when viewed in FIG. 1, is secured at each landing by a bolt 25. The center post 21 may be secured at each flight by a single bolt 26.

The details of the post structure are shown in FIGS. 2 and 3. The post 20 comprises a plurality of U-shaped extrusions or housings 30 closed by caps 31, the extrusions and caps being spliced end to end as will appear. The extrusion includes slots 32 on the internal surface opposite the cap 31, the slots 32 being extruded with serrations which form threads 33 to which screws may be attached. The post has side walls 35 which are internally shouldered at 36 at one end and at 37 at the other end. The shoulders 36 provide a space between them which simply receives a splicing block 38 by which U-shaped sections are joined end to end. The shoulders 37 provide a surface engageable by a clamping block 39 which fastens the cap 31 to the housing 35, the clamping block being secured by screws 40 passing through a hole 41 in the cap 31 to secure the cap 31 to the U-shaped section. The clamping block is longer than the internal width of the mounting post so that it is blocked from turning when the screw 40 is turned.

V-shaped grooves 43 are formed in end surfaces of the walls 35 opposite the shoulders 37, the V-shaped grooves receiving parallel V-shaped ribs 44 extending integrally along the side edges of the cap 31. The groove and rib combination sets the cap properly on the U-shaped extrusion and prevents it from slipping from side to side. Furthermore, where U-shaped sections of housing 30 are spliced end to end, as shown in FIG. 2, with a splicing block 38 bridging the line of contact 45, there would normally be some tendency for the capped side of the posts to shift slightly with respect to each other thereby causing an unsightly misalignment. However, by disposing the joint line 47 of the adjoining caps 31 at a position vertically spaced from the joint line 45 of adjacent housings, the cap bridges 45 and the groove and rib combination prevents the lateral shifting of one U-shaped housing section with respect to its adjacent housing section.

The hand rails 23 have, in the preferred embodiment, downwardly depending flanges 50 by which they are mounted to the posts 20, the flange 50 having holes 51 through which mounting bolts 52 can pass. Each mounting bolt is threaded into a spacer 53 which is secured to the side wall 35 of the post by a bolt 54. It might be noted at this point that all of the work of attaching bolts, splicing posts, installing cable, cable fasteners and the like can be done while the end cap is removed, the placement of the end cap being the last step in the erection of the structure.

In mounting a light fixture 22 to the post 20, a junction box 57 may be used and may not be used depending upon the local electrical code. A junction box 57 is shown in FIG. 3 in order to illustrate the capacity of the invention to provide compliance with the most stringent electrical rules. The cable 58 is fed to the post 20 at the lowest floor, for example through conduit 59 (FIG. 2) buried in the floor, the conduit passing through a spacer 60 and into the post. That cable extends upwardly through the post substantially the full length of the post and is secured at intervals along the length of the post by fasteners 61. The fasteners 61 have tabs 62 which are secured by bolts 63 threaded into the serrated slots 32. The junction box 57 has a mounting tab 64 fastened to it, the mounting tab being secured to the post 20 by bolts 65 threaded into the serrated slots 32. The junction box 57 may be provided with a threaded stud 66 adapted to pass through a hole 69 in a mounting plate 70 in the light fixture, a nut 71 being employed to secure the plate and the light fixture to the stud 68. It should be observed that the posts 20 are very easily erected, the erection requiring the use of only a single bolt and spacer at each floor and landing level. Across to these bolts is laid through the cap end of the posts 20 when the cap is removed. Hand rails 23 are easily secured to the posts and require no additional support. The post serves as a conduit for the electrical cable 58 which is easily mounted in the posts 20. With the cap 31 removed from the post 20, the cable can virtually be laid in its proper position and be secured along its length by cable hangers or fasteners 61. Thus, there is no problem of snaking the cable through vertical and horizontal conduit systems as has been the practice prior to the present invention. The mounting posts admit of the disposition of the light fasteners at those positions best suited for lighting the stairway; namely, the top and bottom steps. From those positions they do not shine the greatest amount of light on the two critical steps but also will light the entire stairway.

I claim:
1. A building structure for a stairway having plural flights of steps around a stair well, said structure comprising, a continuous hollow mounting post secured in said stair well and extending substantially the entire height of the stair well,
light fixtures mounted on said posts at vertically spaced intervals, cable disposed vertically inside said hollow post and connected to said light fixtures, and
hand rails extending generally parallel to each flight of stairs and secured to said post.
2. A building structure for a stairway having plural flights of steps around a stair well, said structure comprising a continuous hollow rectangular mounting post secured in said stair well and extending substantially the entire height of the stair well,
light fixtures mounted on said posts at vertically spaced intervals, cable disposed vertically inside said hollow post and connected to said light fixtures, and
hand rails extending generally parallel to each flight of stairs and secured to said post.
3. A building structure for a stairway having plural flights of steps around a stair well, said structure comprising a continuous hollow rectangular mounting post secured in said stair well and extending substantially the entire height of the stair well,
light fixtures mounted on said posts at vertically spaced intervals, cable disposed vertically inside said hollow post and connected to said light fixtures, and
hand rails extending generally parallel to each flight of stairs and secured to said post.
4. A building structure for a stairway having plural flights of stairs zigzagging upwardly and forming a stair well therebetween, said structure comprising two spaced parallel continuous hollow mounting posts secured at opposite ends of said stair well and ex-
5. Building structure for a stairway having plural flights of steps zigzagging upwardly and forming a stair well therebetween, said structure comprising,

a continuous hollow mounting post secured in said stair well and extending substantially the entire height of the stair well,

light fixtures mounted on said posts adjacent the upper and lower steps of each flight,

cable disposed vertically inside said hollow post and connected to said light fixtures, and

hand rails extending generally parallel to each flight of stairs and secured to said posts.

6. Structure according to claim 5 in which said mounting post comprises,

a plurality of U-shaped housings in end to end abutment,

splicing blocks bridging the joints between abutting housings and secured to both housings,

a plurality of end caps closing said housings and disposed in end to end abutment,

the joints between abutting end caps being vertically spaced from said housing joints, and

means on said end caps and housings blocking transverse sliding movement of said caps with respect to said housings.

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