

July 27, 1954

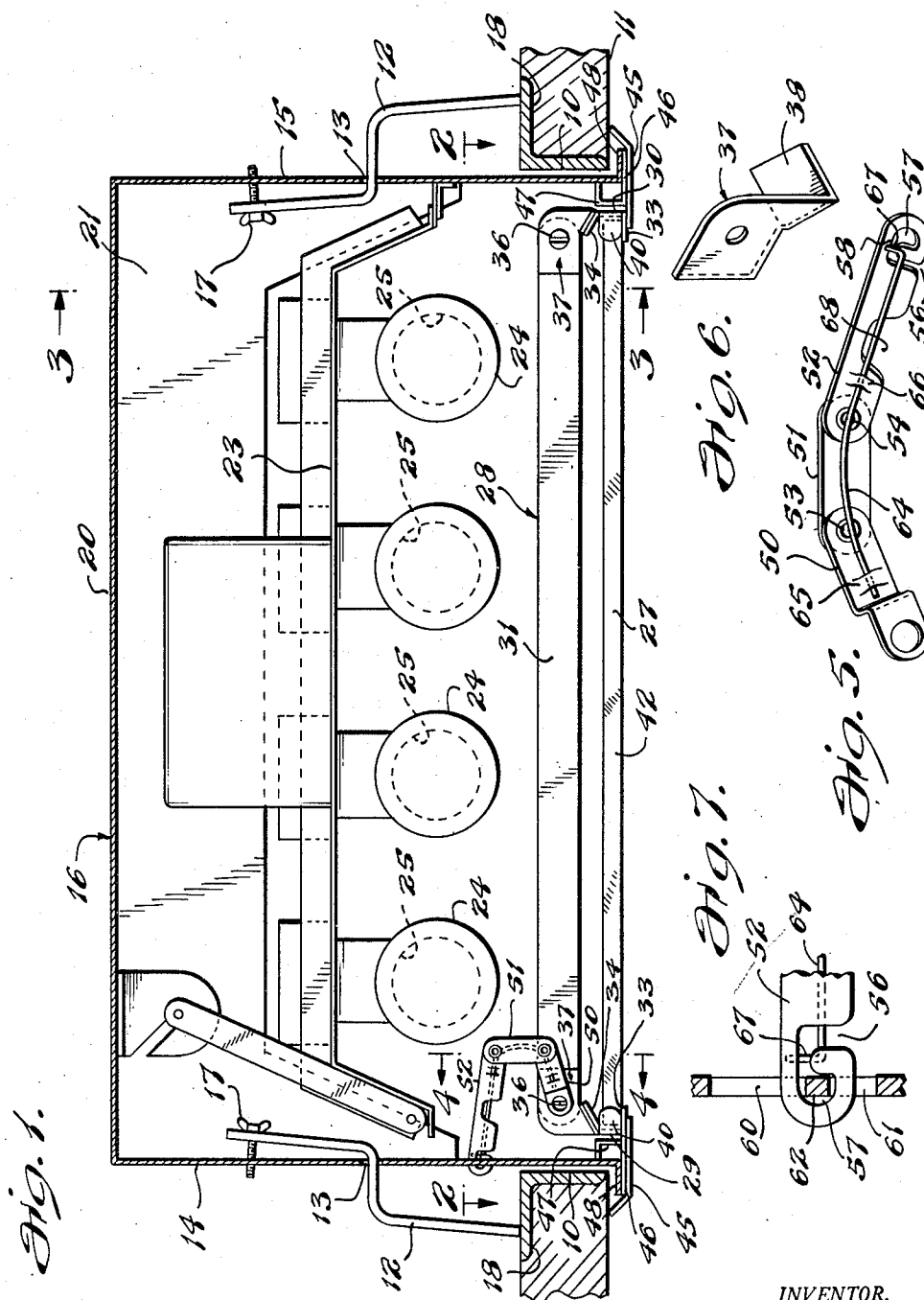
A. E. ZINGONE

2,684,498

HINGE STRUCTURE

Filed June 11, 1952

3 Sheets-Sheet 1



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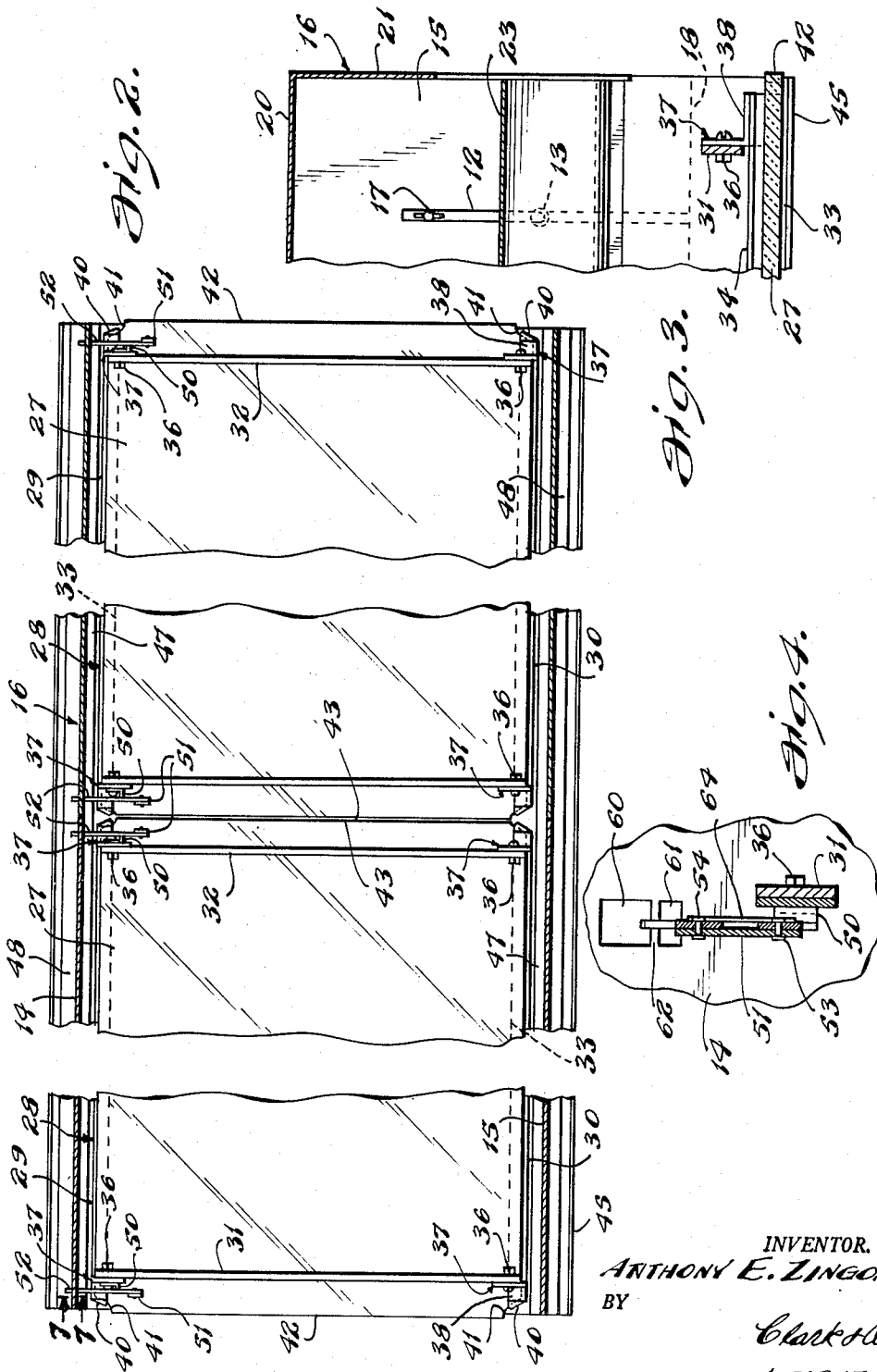
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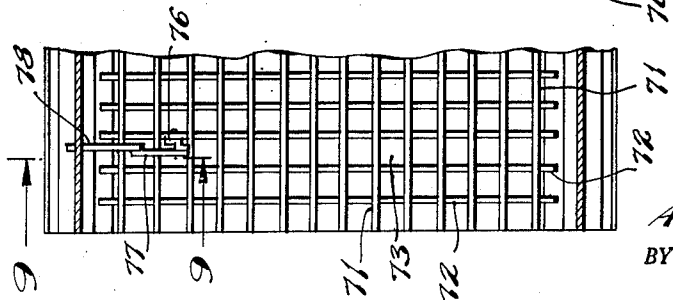
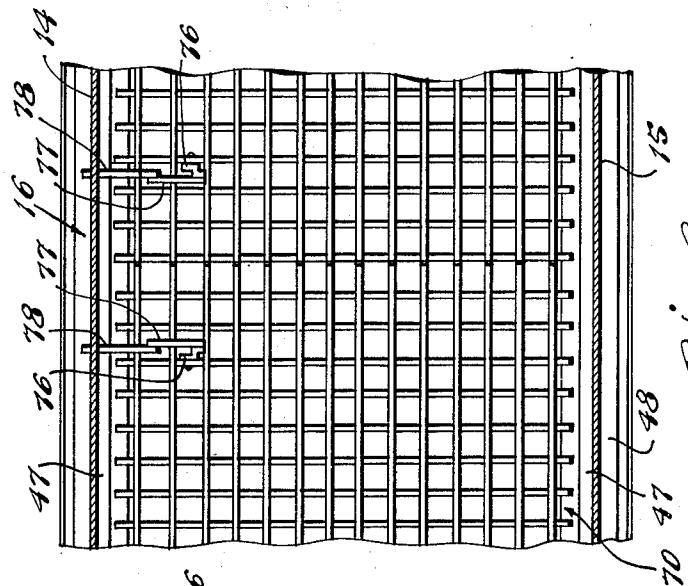
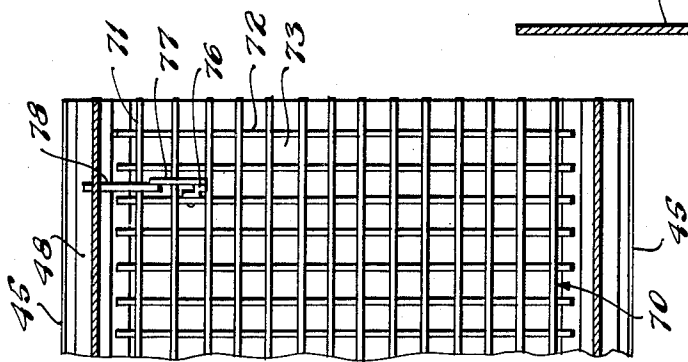


Fig. 8.

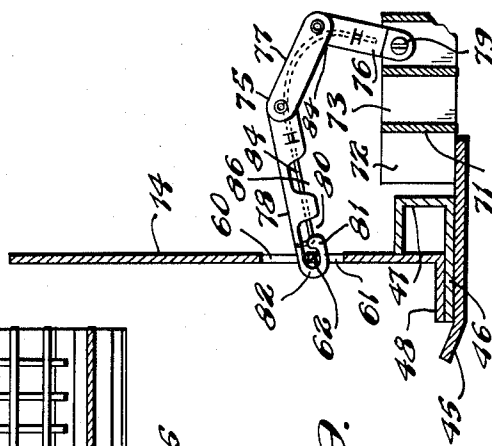


Fig. 9.

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HINGE STRUCTURE

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This invention relates to lighting fixtures and has particular reference to a lighting fixture having a light emitting panel which is hingedly mounted so as to permit of the convenient displacement thereof for cleaning the fixture and replacing the light bulbs.

The invention primarily comprehends a lighting fixture of the ceiling or pendant type adapted to receive fluorescent light bulbs and which may be used as a single fixture or two or more of the fixtures may be arranged in end to end abutting relation. The fixture is provided with a bottom opening which is closed or covered by a light emitting panel and the present invention is directed to means hingedly connecting the panel with the fixture to permit of the canting thereof for effecting the displacement of the panel from closed or covering relation with the bottom opening of the fixture to a dependent relation so as to gain access to the fixture for replacing the light bulbs and for repairing and cleaning the fixture when required.

Another object of the invention is to provide a lighting fixture of said character having a pivoted linkage structure for hingedly connecting the panel with the fixture housing and which is provided with spring means for tensioning the links to maintain the same taut and for releasably retaining the linkage structure in hinged connection with the fixture housing.

Another object of the invention is to provide a panel frame for receiving the glass panel which permits of the arrangement of the panels in abutting end to end relation to prevent the emission of light between the ends thereof.

With the foregoing and other objects in view, reference is now made to the following specification and accompanying drawings in which the preferred embodiments of the invention are illustrated.

In the drawings:

Fig. 1 is a transverse sectional view through a ceiling fixture constructed in accordance with the invention.

Fig. 2 is a fragmentary longitudinal sectional view taken approximately on line 2—2 of Fig. 1.

Fig. 3 is a vertical sectional view of one end of the fixture taken approximately on line 3—3 of Fig. 1.

Fig. 4 is a fragmentary sectional view taken approximately on line 4—4 of Fig. 1.

Fig. 5 is a face view of the linkage construction connecting the glass frame with the housing of the fixture.

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Fig. 6 is a perspective view of one of the end brackets.

Fig. 7 is an enlarged fragmentary sectional view taken approximately on line 7—7 of Fig. 2 showing one of the hinged connections of the linkage structure with the housing.

Fig. 8 is a bottom plan view of a ceiling structure constructed in accordance with the invention and illustrating a modified form of light emitting panels.

Fig. 9 is an enlarged fragmentary sectional view taken approximately on line 9—9 of Fig. 8.

The invention is illustrated in Figs. 1 to 7 inclusive of the drawings, in its application to a ceiling fixture which is secured in an opening 10 in a ceiling 11 by clamps 12 pivoted for swinging movement in openings 13 in the opposite side walls 14 and 15 of the fixture housing 16 and which clamps have thumb screws 17 threadably engaging in openings in the said side walls for tightening the lower ends of the clamps against angle bars 18 bordering the opening 10 at the opposite longitudinal side edges thereof.

The housing 16 is of elongated formation having a top wall 20 and opposite end walls 21 which are of a reduced depth and are connected with the top wall and the opposite side walls 14 and 15. The housing is provided with a support 23 having a plurality of spaced terminal sockets 24 for receiving the ends of fluorescent light bulbs 25. The housing is formed with an open bottom which is closed by one or more glass panels 27, two being shown in the present embodiment.

The panels 27 are mounted in rectangular frames 28 which are of like construction, each consisting of longitudinally extending side members 29 and 30 and end members 31 and 32. The side members 29 and 30 are of angulated formation in cross-section each including an inwardly directed bottom flange 33 and an inwardly and upwardly directed upper flange 34, both of which flanges extend throughout the length of said side members. The end members 31 and 32 are secured by screws 36 to angle brackets 37 having angulated bottom portions 38 which are welded or otherwise secured upon the upper faces of the flanges 34 to dispose the end members 31 and 32 in bridging relation above the side members 29 and 30 adjacent the opposite ends thereof. The panels 27 are mounted upon the flanges 33 of the frames 28 and in order to prevent endwise movement thereof the frames have angulated lugs 40 extending angularly inward from the side members 29 and 30 at the ends thereof to form abutments, the panels being notched at the corners

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to receive the same. Between the said notches the outermost ends 42 thereof project a small distance beyond the ends of the housing to permit of the arrangement of the housings in end to end relation so as to dispose the panels in abutting relation with the panels of adjacent housings to thereby prevent the emission of light therebetween. The innermost ends 43 of the panels are likewise disposed in abutting engagement so as to prevent the emission of light therebetween.

The side walls 14 and 15 of the housing project below the ceiling 11 and are provided with front strips 45 which extend outwardly in covering relation with the ceiling adjacent the opening 10 and which project inwardly to form ledges for receiving and supporting the panel frames 28. The strips 45 are welded or otherwise secured to inner strips 46 which extend longitudinally of the side walls 14 and 15 and have flanges 47 extending along their inner longitudinal edges between which flanges the panel frames 28 are arranged when in supported relation on the ledges formed by the front strips 45. The longitudinal projecting edges of the side walls 14 and 15 are formed with outwardly extending flanges 48 to which the inner strips 46 are welded or otherwise secured.

In order to remove the frames 28 together with the glass panels 27 for gaining access to the interior of the housing for cleaning or repairing the same or changing the light bulbs, the frames 28 are hingedly connected at each end thereof with the housing by means of a pivoted link structure consisting of a plurality of links pivotally connected together in end to end relation and pivotally connected with the glass panel and the housing. The link structure as illustrated, consists of three links 50, 51 and 52, the intermediate link 51 being pivotally connected with the end links 50 and 52 by pivot pins 53 and 54 respectively and the inner link 50 being pivotally connected with the frames 28 by the screws 38. The link 52 is formed with a slot 56 extending inwardly from one edge and which terminates in a downwardly directed enlarged portion 57 and with a narrow longitudinally extending restricted portion 58 therebetween. The links 52 are pivotally connected with the wall 14 of the housing and for this purpose the said wall is provided with longitudinally spaced upper and lower rectangular slots 60 and 61 so as to form a cross-bar 62 adjacent each end of the panels which engages through the enlarged inner ends 57 of the slots 58 of the links 52. Each of the link structures is tensioned to retain the same in taut bent condition as shown in Fig. 1 of the drawings by means of a spring consisting of a spring wire 54 secured at its inner end to the link 50 as at 65 and to the link 52 as at 66 with the outer end 67 of the spring bent into upwardly extending relation and crossing the narrow portion 58 of the slot for preventing accidental release of the hinged engagement of the link structure with the housing. The links 52 are each provided with a recess 68 adapted to receive a thumb or finger for flexing the free outer end of the spring upwardly when releasing the link structure from hinged engagement with the wall 14.

In place of the glass panels 27, the light emitting panels may consist of one or more louvered panels 70. As illustrated in Fig. 8 of the drawings, the louvered panels 70 are of rectangular formation in plan each consisting of vertically disposed longitudinally extending spaced parallel

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plates 71 and vertically disposed transversely extending spaced parallel plates 72 which intersect the longitudinally extending plates to form longitudinally and transversely extending rows of cells 73 opening through the top and bottom of the panels. The panels 70 are supported on the ledges formed by the plates 45 to cover the open bottom of the housing 16 in a like manner in which the glass panels 27 are supported on said ledges. The panels 70 are arranged with the inner ends thereof disposed in abutting engagement and the outer ends are adapted to abut against the panels of adjacent housings.

In order to mount the panels for swinging movement from covering relation with the bottom opening of the housing to a depending relation to permit of access to the housing for cleaning or repairing the same or changing the light bulbs, pivoted link structures 75 are pivotally connected to one side of the panels adjacent the ends thereof and to one of the side walls of the housing. The pivotal link structure 75 is similar to the link structure pivotally connecting the panels 27 to the housing 16 and consists of a plurality of links 76, 77 and 78 which are pivotally connected in end to end relation and with the endmost link 76 pivotally connected to one of the transversely extending plates 72 by a pivot pin 79 while the endmost link 78 is provided with a slot 80 to form a hooked end 81 and an enlarged downwardly directed inner slot portion 82 through which engages the cross-bar 62 of the housing 16. The link structure is similarly provided with a wire spring 84 which is secured to the endmost links 76 and 78 with the outer free end 85 of the spring extending across the slot 80 for retaining the link 78 in hinged engagement with the cross-bar 62. The link 78 is provided with a recess 83 adapted to receive a thumb or finger for flexing the free outer end 85 of the spring for releasing the link 78 from pivoted engagement with the cross-bar 62 of the housing.

Constructed in this manner, the glass panels 27 in the form of the invention illustrated in Figs. 1 to 7 of the drawings and the louvered panels 70 shown in Figs. 8 and 9 of the drawings may be raised at the hinged sides so as to dispose the panels in downwardly inclined relation towards the opposite sides of the housing whereby the same may be moved to clear the supporting ledge and swung into depending relation supported by the pivotal link structure.

What is claimed is:

1. In a hinge structure for swingably connecting two members together, one of which is provided with a cross bar, a link structure including a plurality of links pivotally connected together in end to end relation, one of the endmost links having an offset apertured end portion pivotally connected to one of said members, the other endmost link having a slotted outer end providing a hooked terminal and an enlarged opening at the inner end of the slot for engaging the cross bar of said member, said last mentioned endmost link having a recess intermediate said slot and the pivotal connection of said link with the adjacent link, and a spring wire secured at one end to said first mentioned endmost link and secured inwardly of the opposite end thereof to said last mentioned endmost link between said recess and the pivotal connection of said last mentioned link with the adjacent link, said spring being in tensioned condition to maintain said link structure in taut bent formation when said hooked terminal of said last men-

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tioned link engages said cross bar, and said wire having a free end extending longitudinally of said last mentioned link at one side thereof and across said recess and slot for preventing disengagement of said last mentioned link with said cross bar and which free end is adapted to be sprung to one side by pressure exerted thereagainst in said recess for disconnecting the last mentioned link from said cross bar.

2. In a hinge structure for swingably connecting two members together, a plurality of flat links pivotally connected together in overlapping end to end relation, one of the endmost links being apertured adjacent the end thereof pivotally connected to one of said members, the other endmost link having a slotted outer end providing a hooked terminal and an enlarged opening at the inner end of the slot for engaging the other member, said last mentioned endmost link having a recess extending inwardly from one edge thereof intermediate said slot and the pivotal connection of said link with the adjacent link, and a spring wire secured at one end to a side of said first mentioned endmost link and secured inwardly of the opposite end thereof to said last mentioned endmost link between said recess and the pivotal connection of said last

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mentioned link with the adjacent link, said spring being in tensioned condition to maintain said link structure in taut bent formation when said hooked terminal is in engagement with said other member, and said wire having a free end portion extending longitudinally of said last mentioned link at one side thereof and crossing said recess and slot for preventing disengagement of said last mentioned link when engaged with said member and which free end portion is adapted to be sprung to one side by pressure exerted thereagainst inserted in said recess to permit of disconnecting said last mentioned link from said member.

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