June 15, 1965 F. G. BELLEK 3,189,212

WEATHERPROOF OUTLET WITH RECIPROCABLY MOVABLE CLOSURE PIVOT PIN

Filed July 11, 1961 2 Sheets-Sheet 1

FIG. 1

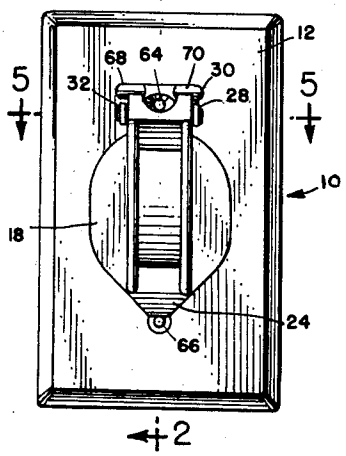


FIG. 2

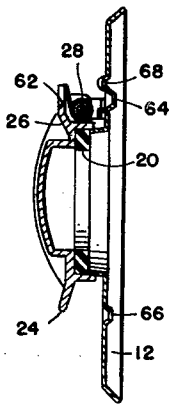


FIG. 4

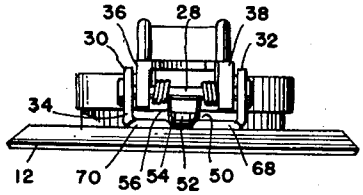


FIG. 5

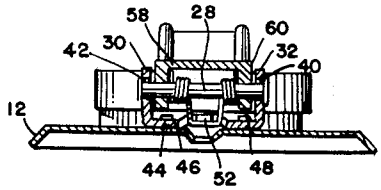


FIG. 3

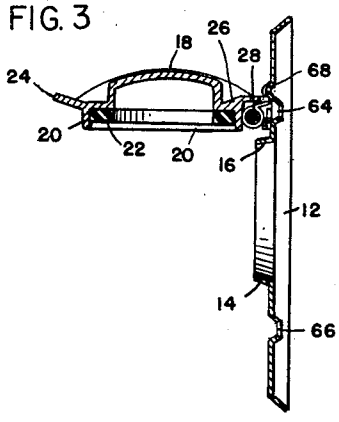


FIG. 6

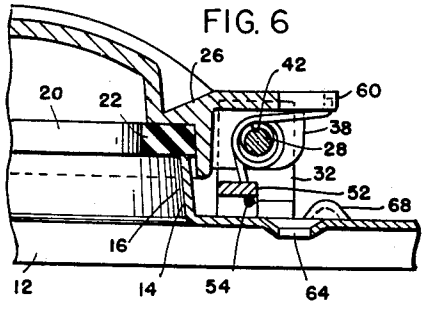
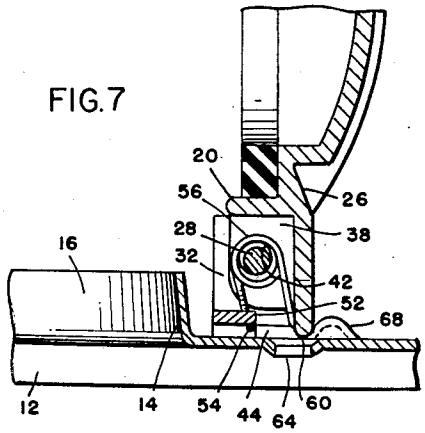


FIG. 7



INVENTOR:

FRANK G. BELLEK

BY

Joseph D. Harbaugh

ATT'Y

June 15, 1965 F. G. BELLEK 3,189,212

WEATHERPROOF OUTLET WITH RECIPROCABLY MOVABLE CLOSURE PIVOT PIN

Filed July 11, 1961 2 Sheets-Sheet 2

FIG. 8

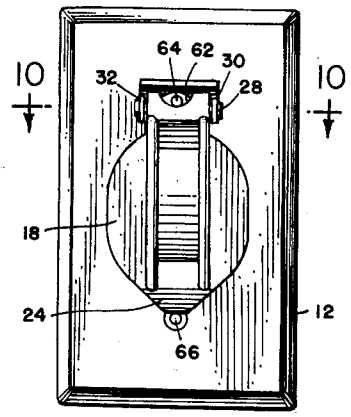


FIG. 9

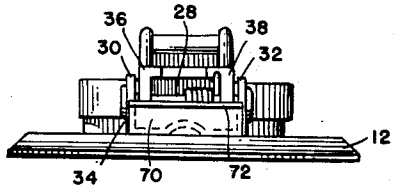


FIG. 10

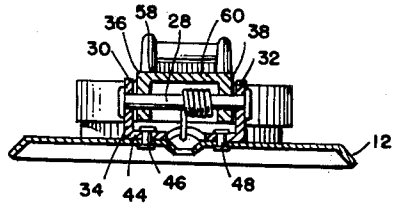


FIG. 11

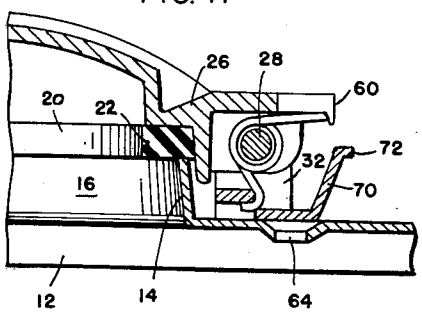
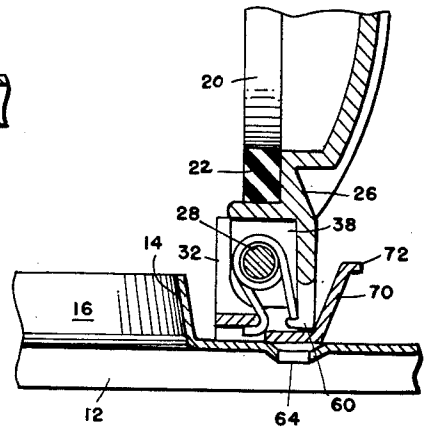


FIG. 12



INVENTOR:
FRANK G. BELLEK
BY
Watson D. Haubaugh
ATT'Y

United States Patent Office

3,189,212

Patented June 15, 1965

3,189,212

WEATHERPROOF OUTLET WITH RECIPROCABLY MOVABLE CLOSURE PIVOT PIN

Frank G. Bellek, Chicago, Ill., assignor to Bell Electric Company, Chicago, Ill., a corporation of Illinois

Filed July 11, 1961, Ser. No. 123,134
5 Claims. (Cl. 220—24.3)

This invention relates in general to weatherproof electrical outlets and more particularly to a weatherproof electrical outlet having a snap-action hinge construction for the outlet closure member.

Various electrical outlets have been constructed utilizing a hinged cover or closure member requiring a plurality of mating parts which corrode and require continual part replacement and maintenance. In addition, many of the prior devices of this nature require an excessive amount of force to position the closure member into the open position and must be either manually held in the open position or else require an additional force and intricate locking mechanism to maintain the closure member in the open position.

Accordingly, it is the primary object of this invention to provide an improved weatherproof electrical outlet which provides a closure member hingedly secured to a base plate which eliminates the necessity of a plurality of mating parts and may be readily positioned and secured into the open position with a minimum of effort.

It is a further object of this invention to provide an improved weatherproof electrical outlet having a closure member which is biased towards the closed position with a positive sealing action which protects the outlet against all weather conditions and which can be easily opened and be retained in the open position.

Another object of the invention is to provide a bracket affixed to the base plate of the outlet to which a closure member is pivotally secured so as to effect stresses in a spring for securing the closure member into the closed or open position.

Another object of this invention is to provide an improved weatherproof electrical outlet wherein a spring is effective to bias a closure member into a closed position but which is mounted in such a manner as to resiliently hold the closure member into engagement with a portion of the base plate when the closure member is in the open position.

Another object of this invention is to provide an improved weatherproof electrical outlet having a closure member, biased towards the closed position, pivotally secured to a flange member in such a manner as to permit minute movement in a vertical plane of the closure member relative to the flange to permit the closure member to move past abutments on the base plate to attain the open position.

Another object of this invention is to provide an improved weatherproof electrical outlet having a biased closure member pivotally secured to a flange member secured to the base plate with one end of the closure member engaging a flexure member of the flange when the closure member is moved towards the open position and is retained by the flexure member when the closure member is in the open position.

A further object of this invention is to provide a weatherproof outlet which is simple in design, economical to manufacture, yet rugged in construction to withstand violent impact and all weather conditions.

Other objects and advantages of the invention will become apparent as the description proceeds in accordance with the drawings, in which:

FIG. 1 is a front elevational view of the weatherproof electrical outlet of a preferred embodiment of this invention;

FIG. 2 is a cross-sectional view in side elevation taken along the line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view similar to that shown in FIG. 2 with the closure member in the open position;

FIG. 4 is an end elevational view illustrating the pivotal hinge connection of the closure to the flange member;

FIG. 5 is a cross-sectional end view taken along the line 5—5 of FIG. 1;

FIG. 6 is a fragmentary enlarged cross-sectional view in side elevation of the pivotal hinge connection of this invention illustrating the relationship of the mating parts with the closure member in the closed position;

FIG. 7 is a fragmentary enlarged sectional view in side elevation of the pivotal hinge connection illustrating the relationship of the mating parts with the closure member in the open position;

FIG. 8 is a front elevational view of a weatherproof electrical outlet of another embodiment of this invention;

FIG. 9 is an end elevation view illustrating the hinge portion of the outlet;

FIG. 10 is an end elevation partially sectioned taken along the line 10—10 of FIG. 8;

FIG. 11 is a fragmentary enlarged cross-sectional view in side elevation, similar to FIG. 6, illustrating the relationship of the mating parts of the hinge with the closure member in the closed position;

FIG. 12 is a fragmentary enlarged cross-sectional view in side elevation, similar to FIG. 7, illustrating the relationship of the mating parts of the hinge with the closure member in the open position.

Referring now to FIGS. 1 through 7, the preferred embodiment of the weatherproof outlet 10 of this invention comprises a base plate 12 having an annular flange 14 which defines a circular opening 16 adapted to be disposed in register with a conventional electrical wall socket (not shown). A cover 18, having a depending annular flange 20, is adapted to seat in sealing relationship to the flange 14 by means of a gasket 22 disposed within the annular flange 20. The cover 18 has an arcuately shaped handle 24 formed integrally at one end thereof and at the other end a hinge extension 26 is provided which is mounted on a pivot bar 28 reciprocally held in spaced-apart arms 30 and 32 of a bracket 34 which defines openings 40 and 42 of a size appreciably larger than the bar 28 to permit minute movement of the bar in a direction normal to the plane of the flange 14. The hinge extension 26 provides parallel depending flanges 36 and 38 for receiving the pivot bar 28. A cross plate 44 of the bracket 34 is fastened to the base plate 12 by rivets 46 and 48.

Referring now more specifically to FIGS. 4, 5, 6 and 7, the cross plate 44 of bracket 34 has a center portion 50 elevated to provide a short extension 52 to which a lower central loop 54 of a spring member 56 may be readily hooked thereunder. The spring member 56 has each leg thereof extending up from the loop 54 coiled around the pivot bar 28 with the ends thereof extending upwardly and engaging the under surface of ends 58 and 60 of the hinge extension 26. It is readily apparent that by having the center of the spring anchored to the bracket 34 with ends of the spring acting against the undersurface of the ends 58 and 60 after being coiled about the pivot bar 28, the closure is continually biased towards the closed position as best seen in FIG. 6. The hinge extension 26 of the closure has a centrally recessed portion 62 which forms the two spaced ends 58 and 60. The recessed portion 62 is provided to permit ready access to a hold down screw (not shown) which passes through an opening 64 in the base plate 12 to secure the complete outlet to any surface as desired. A similar opening 66 is formed in the base plate 12 beneath the handle 24, when the closure is in the closed position, as best seen in FIGS. 2 and 3.

Referring now to FIGS. 1, 6 and 7, spaced abutments 68 and 70 are formed in the outer surface of the base plate 12 adjacent the rearward edge of the bracket 34. The abutments provide sloping side walls with a rounded upper portion and are dimensionally formed and positioned for interference contact of the inner sloping side walls with the ends 58 and 60 when the closure is moved towards the open position. As force is applied to the handle 24 to position the closure in the open position, the ends 58 and 60 contact the inner sloping surfaces of the abutments 68 and 70. As the ends bear against the abutments, the entire closure will minutely move in a vertical plane carrying with it the pivot bar 28. The amount of movement in the vertical plane, being limited by the size of the openings 40 and 42 in flange members 30 and 32 in which the pivot bar 28 is journalled, is sufficient to permit the ends 58 and 60 to complete their arcuate swing past the inner sloping surfaces of the abutments to attain the open position as illustrated in FIG. 7. The spring member 56, being anchored to both the bracket 34 and hinge extension 26 and coiled around the pivot bar 28, resiliently urges bar 28 and the closure downwardly and outwardly towards the butments 68 and 70 when the closure reaches the open position which forces the ends 58 and 60 against the lower portion of the inner surfaces of the abutments locking the closure in the open position. The force required to move the closure to the open position is very slight since the mechanical advantage, approximately 9 to 1 ratio, due to the distance from the handle to the pivot bar and from the pivot bar to the ends 58 and 60, with only the force of spring member 56 and a force to pass the interference contact of the ends 58 and 60 with the side walls of the abutments 68 and 70 to be overcome. In like manner, only a minute force is required to place the closure in the closed position since the force of the spring is directed to close the closure, and as soon as the ends 58 and 60 ride up and pass the interference contact with the sloping side walls of the abutments the spring 56 takes over and snaps the closure shut in sealing relationship with the annular ring 14. Thus it is readily understood that the torsional stress of spring 56 is utilized to urge the closure member towards the closed position and the tensile stress of spring 56 is utilized to force the closure member into positive contact with the abutments to maintain the open position.

Referring now to FIGS. 8, 9, 10, 11 and 12, an alternate embodiment of the weatherproof outlet 10 of this invention is illustrated. In view of the similarity of many of the portions of this embodiment with the preferred embodiment just described, like numerals are used to designate the similar parts.

The weatherproof outlet 10 of this embodiment comprises a base plate 12 having an annular flange 14 which defines a circular opening 16 adapted to be disposed in register with a conventional electrical wall socket (not shown). A cover 18, having a depending annular flange 20, is adapted to seat in sealing relationship to the flange 14 by means of a gasket 22 disposed within the annular flange 20. The cover 18 has an arcuately shaped handle 24 formed integrally at one end thereof and at the other end a hinged extension 26 is provided which is pivotally mounted on a pivot bar 28 reciprocally held in spaced-apart arms 30 and 32 of a bracket 34, a flange extension 26 having parallel depending flanges 36 and 38 defining openings 40 and 42 for receiving the pivot bar 28. The bracket 34 has a lower cross plate 44 secured to the base plate 12 by rivets 46 and 48. The center portion, indicated as 50, of the lower cross plate 44 is elevated to provide a recess to which one end of a spring member 56 may be readily secured as will be explained. A rear wall 70, formed as an integral portion of the bottom plate member 44, extends upwardly and outwardly from the base plate 44 with the upper edge of the rear wall angularly contoured as at 72. The rear wall 70 extends across the entire width of the bracket 34 but has the end edges thereof severed from the flange members 30 and 32.

The spring member 56 has one end thereof angularly formed to be received beneath the elevated portion 50 of the lower plate 44 and extends upwardly therefrom and coiled about the pivot bar 28 with the other end extending upwardly and received in a recessed slot formed in the under surface of the hinge extension 26, as best seen in FIGS. 11 and 12. It is readily apparent by having one end of the spring secured to the bracket 34, then coiled about the pivot bar 28 with the other end bearing on the under surface of the hinge extension 26, that the force of the spring is directed to retain the closure member in the closed position at all times. The hinge extension 26 of the closure has a centrally recessed portion 62 which forms two spaced ends 58 and 60. The recessed portion 62 is provided to permit ready access to hold-down screws (not shown) which pass through an opening 64 in the base plate 12 to securely anchor the outlet to a surface as desired. A similar opening 66 is formed in front of the annular ring 14 beneath the handle 24 as described in the preferred embodiment.

Referring now more specifically to FIGS. 11 and 12, the closure member is retained in the closed position by the spring 56 until sufficient force is applied to the handle 24 to move it towards the open position. As the closure member is raised, the ends 58 and 60 of hinge extension 26 contact the inner surface of the rear wall 70 of bracket 34 with the rounded upper portion 72 aiding in guiding the ends 58 and 60 into proper contact. As the force is continued on the handle 24, the ends 58 and 60 will bear against the inner surface of rear wall 70. Due to the severance of the ends of the rear wall 70 with the flange members 30 and 32 of bracket 34, the rear wall 70 will be forced outwardly and downwardly to permit the closure member to attain the full open position as illustrated in FIG. 12. The rear wall 70, acting like a cantilever beam, will spring back to its normal position after the ends 58 and 60 have reached the lowermost edge thereof and will abut against the upper edge surface of ends 58 and 60 to retain the closure member in the open position. As previously described for the preferred embodiment, the amount of force required to be exerted on the handle 24 to raise the closure member to the open position is very minute with only the force of the spring 56 and the resiliency of the rear wall 70 of the bracket 34 to be overcome. In like manner, the force required to close the closure member is also quite minute since the force of spring 56 is directed to close the closure member with only an additional force required to permit the ends 58 and 60 to ride upwardly against the inner surface of back wall 70 forcing it outwardly and immediately upon the ends 58 and 60 passing from contact with the inner surface of back wall 70 the spring 56 snaps the cover into a positive sealing relationship with the annular ring 14.

Since there are relatively few parts and these are in a permanently assembled condition, the device as described of the two embodiments illustrated is not subject to wear or mechanical breakdown. Furthermore, the simplicity of the construction is such that variations in manufacturing tolerances will not affect its operation while the ease with which the cover can be moved from open to closed position or from closed into automatically locked open position insures that it can be used in ordinary household as well as commercial application without difficulty.

Although I have described my invention with respect to certain principles and details in specific embodiments thereof, it will be understood by those skilled in the art that these may be varied in accordance with the spirit and scope of the appended claims.

What is claimed:

1. A weatherproof outlet comprising a base plate; an upstanding annular ring integral with the surface of said base plate defining an opening therethrough for receipt of

an electrical outlet; a closure member having a flat internal seating surface; a sealing member received within said closure on said seating surface, said sealing member engaging said annular ring when the closure member is in the closed position; a bracket member secured to said base plate having upwardly extending parallel bracket flanges; a pivot bar journalled in said bracket flanges; a hinge extension on said closure member having depending flanges pivotally mounted on said pivot bar; a spring member having a leg secured to said bracket against lengthwise movement of the leg, coiled about the pivot bar and secured to the hinge extension, torsional stress of said spring member retaining the closure member in the closed position and abutments formed on the base plate adjacent the bracket in juxtaposition for frictional interference contact with the ends of said hinge extension when the closure member is moved towards the open position, tensile stress induced upon said leg of said spring member maintaining physical contact between the ends of said hinge extension and the abutments to retain the closure member in the open position.

2. A weatherproof outlet comprising a base plate, an annular ring defining an opening in the base plate to be disposed in register with an electrical outlet, a bifurcated bracket secured to the base plate having apertures through each side thereof, a pivot pin of a diameter appreciably less than the diameter of the apertures in a plane vertical to the base plate and disposed within the apertures parallel to said base plate for rotational and reciprocal movement in said vertical plane, an abutment on said base plate in said vertical plane, a closure member secured to said pivot pin movable in a path of interference with said abutment, and a coiled spring member about said pivot pin engaging said closure member and said bracket, torsional stress of the spring urging rotation of the closure member to its closed position, and tensile stress of the spring urging said pin to hold said closure member in said path of interference with said abutment.

3. A weatherproof outlet comprising a rectangular base plate element having an upstanding annular ring formed in the surface thereof defining an opening for receipt of an electrical device, a closure member carrying a sealing member therein seating in sealed relationship on said annular ring when the closure member is in the closed position, a bracket element having spaced apart upstanding legs having axially aligned apertures, a pivot bar reciprocably mounted in said apertures, a hinge extension on said closure member engaging the pivot bar permitting pivotal rotation of the closure member relative to the base plate, a spring member coiled about said pivot bar with a portion of said spring member hooked to said bracket element and another portion of the spring member engaging the hinge extension under deflection to urge the pivot bar towards said base plate element, an abutment member formed integrally with one of the said elements in juxtaposition for interference contact with the marginal edge of the hinge extension as the closure moves to the open position, said pivot bar and abutment member moving relative to each other to pass said hinge extension and hold said closure member in the open position against the force of the spring member.

4. A weatherproof outlet comprising a base plate member, an opening in the base plate member to be disposed in register with an electric outlet, an interference element

on the base plate member spaced from said opening, an upwardly extending set of parallel bracket flanges on the base plate member adjacent to said interference element, a closure member for sealing said opening having a set of parallel bracket flanges, said sets of bracket flanges being disposed in side by side relationship with respect to each other, one of said sets of bracket flanges having axially aligned apertures through the flanges thereof, a pivot bar of a diameter appreciably less than the diameter of said apertures carried by the other set of bracket flanges and disposed pivotally within the apertures for relative reciprocable movement between said sets in a radial direction with respect to said interference element, said closure member having an element movable in a path of interference contact with said interference element at one limit of said reciprocable movement during pivotal movement of the closure member, a spring coiled about said pivot bar having one end secured to one of the members under tensional stress and the other end secured to the other member under torsional stress, one of said stresses urging said movable element radially into interference contact with said interference element and the other stress urging said closure member rotationally to seal said opening.

5. A weatherproof outlet comprising a base plate member, an opening in the base plate member to be disposed in register with an electric outlet, an upwardly extending set of parallel bracket flanges on the base plate member spaced from said opening, a closure member movable between two positions in one of which the closure member seals said opening and having a set of parallel bracket flanges, said sets of bracket flanges being disposed in side by side overlapping relationship, one of said sets of bracket flanges having axially aligned apertures through the flanges thereof, an interference element on one of said members spaced from said opening, pivot pin means of a diameter appreciably less than the diameter of said apertures carried by the other set of bracket flanges and disposed within said apertures for relative reciprocable movement between said sets in a radial direction with respect to said interference element, one of said members having an element movable in a path of interference contact with said interference element upon pivotal movement of the closure member, a spring coiled about said pivot pin means having one end secured to one of the members under tensional stress and the other end secured to the other of the members under torsional stress, one of said stresses urging said movable element into interference with said interference element and the other stress urging said closure member to one of its said positions, an increased torsional stress upon one end of the coiled spring increasing the tensional stress exerted by the other end of the coiled spring.

References Cited by the Examiner

UNITED STATES PATENTS

2,867,345	1/59	Bellek	220—24.3
2,985,334	5/61	Slater	220—24.3
2,987,214	6/61	Radack	220—24.3
3,029,972	4/62	Robbins	220—35

JOHN F. BURNS, *Primary Examiner.*

E. JAMES SAX, JOHN P. WILDMAN, *Examiners.*