April 17, 1962 A. ROBBINS 3,029,972

SPRING LOADED COVER MEANS

Filed Aug. 24, 1959

FIG. 1

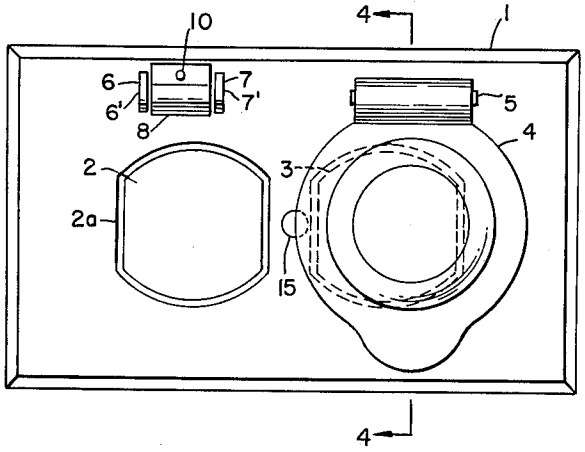


FIG. 2

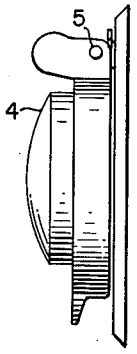


FIG. 3

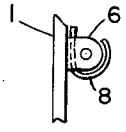


FIG. 5

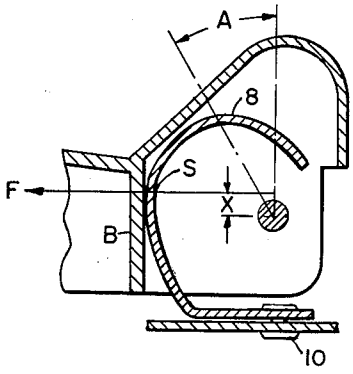
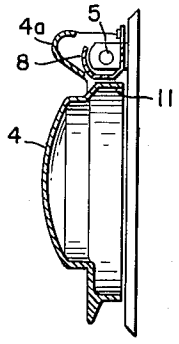


FIG. 4



INVENTOR

ALFRED ROBBINS

BY

ATTORNEY

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SPRING LOADED COVER MEANS

Alfred Robbins, Elmhurst, N.Y., assignor to Perfect-Line Manufacturing Corp., Hicksville, N.Y.

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This invention relates to spring loaded cover means for outside electrical cover plates, and more particularly to such means which have an open position.

Prior cover plates of this type generally used coil type springs so that the cover could not be left open unless additional latch or detent means were provided. This made these prior plate assemblies difficult to install and to use.

The prior coil spring covers were also difficult to assemble and were subject to corrosion, especially in outside locations.

The present invention provides a cover plate having a pivotally mounted cover which cooperates with a curved leaf spring, so that when the cover is opened a predetermined small amount, the spring will cause the cover to snap shut. But when the cover is opened more than the predetermined amount, the spring pressure on the cover will hold the cover in a desired open position. This is accomplished by applying the spring force through one side of the pivot point for small openings and moving it on the other side of the pivot point for larger openings, as will be discussed.

Accordingly, the principal object of the invention is to provide new and improved snap cover means.

Another object of the invention is to provide new and improved snap cover means having an open position, without any additional latching means.

Another object of the invention is to provide new and improved snap cover means without the use of coil springs.

Another object of the invention is to provide new and improved snap cover means having a curved leaf spring, bearing against the cover in such a manner that when the cover is raised a small amount the spring will tend to close the cover; but when the cover is raised more than a predetermined amount, then the spring will hold the cover in the opened position.

These and other objects of the invention will be apparent in the following specifications and drawings, of which

FIGURE 1 is the plan view of the embodiment of the invention.

FIGURE 2 is a side view of the embodiment of FIGURE 1.

FIGURE 3 is a detailed view of the curved spring mounting.

FIGURE 4 is a sectional view taken through the lines 4—4 of FIGURE 1.

FIGURE 5 is a diagram illustrating the operation of the invention.

Referring to the figures, the invention generally comprises a cover plate 1 having a pair of apertures 2 and 3 for the electric plugs to be inserted. A cover 4 is pivotally mounted on a pair of mounting ears connected to the plate 1 by means of the pin 5. The left-hand side of FIGURE 1 shows the construction with the cover plate removed, illustrating the mounting ears 6 and 7, and the curved leaf spring 8 which is riveted to the plate 1 by means of the rivet 10.

Referring to FIGURE 3, the curved spring 8 extends slightly beyond the ear 6. The spring has a generally U or hook shape, and preferably has a bend at one point.

Referring to FIGURE 4, the spring 8 bears against the side 11 of the cover 4 at the point where the rounded side of the cover is tangent to the spring 8. The portion 4a

of the cover 4 encloses a hollow space, and the end pieces connected to the portion 4a have suitable mounting holes for receiving the mounting pin 5. The spring 8 is preferably of spring steel and is formed and mounted to exert pressure on the cover 4 at all times.

FIGURE 5 shows the operation of the invention. In the closed position of the cover 4 a force F is exerted through the bent point S on the spring at a distance X from the pivot point. As the cover is rotated open gradually, the spring will be deformed but will not move relative to the cover so that the force F will continue to operate through the point S on the spring and tend to snap the cover shut. However, as the cover is opened still more the limit of motion of the spring will be reached and the cover will then move relative the spring and the moment arm X will be gradually decreased until the moment FX is equalled by the friction between the spring and the cover at which balance point the cover will remain open. The cover will also remain open at all greater openings than this balance point. This balance point may be adjusted by changing the shape and/or the strength of the spring.

At large openings of the cover the force F will operate through the other side of the pivot point. When the point B on the cover enters the arc of angle A the cover will be fully open substantially perpendicular to the mounting plate 1.

The apparatus is assembled by riveting the springs to the plate 1 as shown by the rivet 10. The cover is then mounted on the ears 6 and 7 by passing the pin 5 through the mounting holes 6' and 7' in the ears and corresponding mounting holes in the portion 4a of the cover 4. The size of the spring is chosen and it is positioned to extend out beyond the curved ends of the mounting ears so that there is spring pressure on the cover at all times.

The apertures 2 and 3 in the plate have a raised lip as at 2a, and the cover preferably has a rubber gasket on its inside which is adapted to make a good seal against the raised lip of the apertures. The covers are off-centered with respect to the apertures. The plate 1 is generally mounted with a single screw through the mounting hole 15.

Therefore, the present invention provides new and improved cover means for electrical receptacle plates in which the covers are adapted to be spring loaded shut for small openings of the cover, but which are adapted to be held open at any of a number of different positions by the same spring. This arrangement permits easy mounting of the plate by inserting a screw through the mounting hole 15, since it may be done with the covers open. In the prior devices where the covers had a coil spring it was quite awkward to install the plate while holding the covers open.

Many modifications will occur to those desiring to practice the information without departing from the scope thereof which is set forth in the attached claim.

I claim:

Spring loaded cover means having adjustable open positions comprising a plate member having an aperture, a generally U shaped curved leaf spring connected at one end thereof to said plate, a shaft mounted on said plate on the interior side of said U shaped spring, a cover having a relatively flat plate-contacting area pivotally mounted on said shaft and adapted to cover said aperture, said cover having a plane surface substantially perpendicular to the flat area of said cover adapted to bear tangentially against said U shaped spring, said spring being shaped to apply a force to said cover plane surface on one side of said shaft when said cover is in closed position, said spring having a first arcuate surface located relative said shaft so that as said cover is opened from closed position said spring bends but does not substantially move its contact point with and on said cover and tends to close said cover

until said cover is raised a predetermined amount, said spring having a second arcuate surface curved relative said plane surface so that upon further opening of said cover said contact point on said cover surface moves on said spring to change the direction of force of said spring toward the other side of said shaft, said arcuate surfaces being joined by and at a radially raised bend in said spring providing a dead-center point from each side of which the cover closing and cover opening forces of said spring progressively increase whereby said cover may be held open in a plurality of stable adjustable positions.

References Cited in the file of this patent

UNITED STATES PATENTS

1,985,587	Storris	Dec. 25, 1934
2,324,738	Stieglitz	July 20, 1943
2,542,987	Breck	Feb. 27, 1951