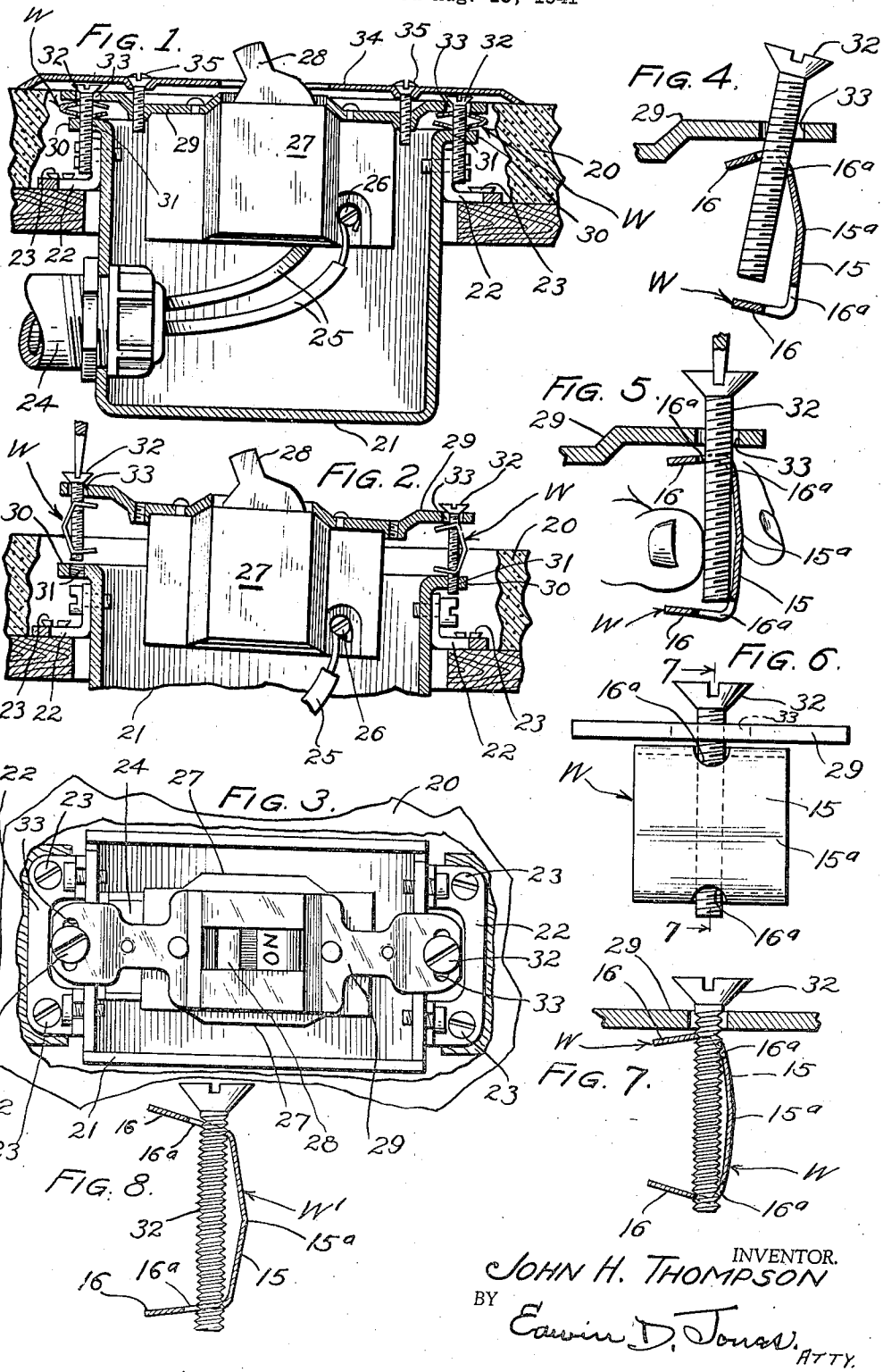
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WASHER

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INVENTOR.
JOHN H. THOMPSON
BY
Edwin D. Jones ATTY.

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WASHER

John H. Thompson, Glendale, Calif., assignor to Ruel R. Thompson, Glendale, Calif.

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My invention relates to electric switches as used in walls and the like, and it has particular reference to those washers employed on the screws for securing the retaining strap of the switch to the outlet box and in such adjusted position thereon that it is flush with the wall surface to permit securing of the cover plate contiguous to the wall.

Such washers as now in use are in the form of flat metal rings, and, in consequence, to properly adjust a switch in an outlet box by the use of such washers it is necesary to place as many washers on the screws as are required to limit inward movement of the screws to those positions in which the retaining strap at its ends is flush with the surface of the wall. Such a method of securing the required adjustment is not only tedious, but time-consuming, and furthermore, because in applying the screws to the threaded holes of the outlet box the washers frequently fall from the screws and into inaccessible points in the box, many washers are wasted.

It is a purpose of my invention to provide a washer which is wholly devoid of the aforestated disadvantages by virtue of its being so characterized structurally and functionally as to require the use of only a single washer for each screw; automatically securing itself to the screw when once applied, and thus facilitating application of the screw to the outlet box; and frictionally retaining the screw in any position of adjustment necessary to maintain the switch retaining strap flush with the surface of a wall.

I will describe only two forms of washers each embodying my invention, with one washer in association with a conventional type of switch, outlet box and cover plate, and will then point out the novel features thereof in claims.

In the accompanying drawing:

Fig. 1 is a fragmentary vertical sectional view of the wall, with an outlet box therein, and an electric switch secured in final position to the outlet box by screws to each of which is applied one form of washer embodying my invention.

Fig. 2 is a view similar to Fig. 1 with a part of the outlet box broken away and the switch in the process of being secured in place to the outlet box.

Fig. 3 is a view showing the outlet box and switch retaining plate in plan.

Fig. 4 is an enlarged longitudinal sectional view of the washer embodying my invention, showing a screw extended through the retaining strap of the switch and through one opening of the washer.

Fig. 5 is a view similar to Fig. 4 showing the screw about to be extended through the other opening of the washer.

Fig. 6 is a view showing the screw in its final position on the washer ready for application to the outlet box.

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 6.

Fig. 8 is view showing in longitudinal section another form of washer embodying my invention with a screw in place therein.

Similar reference characters refer to similar parts in each of the several views.

The washer embodying my invention is designated generally at W, and is constructed from a sheet of bendable metal, or any other material possessing the requisite flexibility. The washer, in its present form, comprises a connecting portion 15 at the extremities of which are a pair of angularly disposed end portions 16, 16, which are relatively short as compared to the length of the connecting portion.

The washer, in its original form, may have the end portions 16 disposed substantially in parallelism and at obtuse angles to the ends of the connecting portion 15, for the latter is bowed from end to end, as shown in Figs. 4, 5 and 7 The bow of the connecting portion 15 is outwardly from the end portion 16, while medially of its ends the connecting portion is bent transversely outward as at 15*a*. A pair of openings 16*a*, 16*a* are formed in the washer W preferably at the junction of each portion 16 and the connecting portion 15. As best shown in Fig. 4, these openings 16*a* are disalined one with respect to the other so as to require flexing of the washer in order to extend the shank of a screw through the two.

It will be noted that the openings 16*a* are larger than the diameter of the shank of the screw which is employed in conjunction with the washer. This is for the purpose of permitting lateral shifting of the screw in the openings, as will be more fully described hereinafter.

In Figs. 1, 2 and 3 is illustrated a wall 20 having an opening therein in which an outlet box 21 is secured by brackets 22 and screws 23. A conduit 24 projects into one side of the outlet box, and conducting wires 25 extend from the conduit for connection to the binding posts 26 of a conventional light switch 27 of the snap type, and having an operating arm 28.

The switch 27 includes the usual metal retaining strap 29 secured at its ends to the outlet box 21 by ears 30 formed on the latter and having threaded openings 31 therein into which screws 32 extending through slots 33 of the strap 29, are adapted to be threaded. A conventional cover plate 34 is secured in covering relation to the switch and wall opening by screws 35 threaded in the strap 29.

It is to each of these two screws 32 that my previously described washer W is adapted to be applied. The manner of applying the washer to

the screw will be best understood from a consideration of Figs. 4 to 7. As shown in Fig. 4, the screw **32** is first extended through the slot **33** at the respective end of the strap **29**, and then through one of the openings **16***a* of the washer. This opening **16***a* is so located in the washer that its axis is at an acute angle to the inner side of the upper end portion **16**. Thus, to extend the screw **32** therethrough it is necessary that the latter occupy the axial position shown in Fig. 4.

Similarly, the other opening **16***a* is so located in the washer that its axis is at an acute angle to the inner side of the lower end portion **16**, and thus disalined with respect to the upper opening **16***a*. Therefore, to extend the screw **32** through the lower opening **16***a* it is necessary to first move the screw laterally from the position shown in Fig. 4 to that shown in Fig. 5, and then by pressing the screw head so that the screw is forced inwardly of the washer, its shank can be extended through the lower opening **16***a*. During such application of the screw the connecting portion **15** of the washer is placed under such slight tension that those portions of the walls of the openings **16***a* in the end portions **16**, are caused to engage the threads of the screw (Fig. 7), and thereby so secure the washer on the screw that it cannot fall therefrom.

With both washers applied to both screws **32** as above described, it will be clear that by applying the switch **27** to the outlet box **21** the retaining strap **29** can be handled without fear of the washers dropping from the screws or the screws falling from the strap. But what is more important, is that the premounting of the washers on the screws renders extremely simple the application of the screws to the threaded openings **31** of the ears **30**, for the washers function to hold the screws substantially at right angles to the retaining strap and thus the leading ends of the screws may be readily threaded into the ears.

By reference to Fig. 2, it will be seen that first one screw **32**, and then the other, is screwed into the respective ear **30**, and that during and under inward movement of each screw the end portions **16** of the washer are forced toward each other. As a consequence, the connecting portion **15** is placed under compression to retain the walls of the opening **16***a* in engagement with the threads of the screw. With each complete turn of the screw the connecting portion yields and the screw shifts laterally in the openings **16***a* to allow the walls of the openings to pass over one pair of threads and immediately into engagement with another pair of threads. Thus, at all times the walls of the openings **16***a* are in engagement with the threads of the screw. As the compression of the connecting portion **15** acts to urge the end portions **16** apart, it will be clear that the walls of the openings **16***a* engage the screw threads with such pressure as to operate to lock or at least frictionally retain the screw in any position of adjustment. Manifestly, therefore, irrespective of to what position the screw is adjusted necessary to bring the retaining strap to a position flush with the outer surface of the wall, the washer so grips the threads of the screw to maintain the latter in that position.

When inward adjustment of the screw **32** reaches a point in which the normal bow of the connecting portion **15** is exceeded, such portion begins to bend outwardly at the transverse bent portion **15***a*. As this portion is medially of the ends of the connecting portion, bending of the latter at this point is at all times insured to attain the advantage of causing the bow to urge the two end portions **16** outwardly wtih equal force, and thus both end portions will continue to engage the threads of the screw and thereby effectively secure the screw in any position of adjustment.

Referring now to Fig. 8, I have here shown a washer W' identical in construction to the washer W except that the screw receiving openings indicated at **16***b* although adjacent the ends of the connecting portion, **15**, are wholly within the end portions **16** and alined one with the other so that a screw **32** can be initially extended through both of the openings without flexing of the washer or causing the threads of the screw to engage the walls of the openings. As a consequence, the washer W' is not retained on the screw to facilitate application of the latter to the ear **30** as with the washer W.

However, once the screw is threaded into the ear **30** with the washer W' thereon and the screw adjusted inwardly to secure the required adjustment of the retaining strap, the connecting portion **15**, although bent at the point **15***a*, is under such stress as to set up a pressure axially outward on the screw which acts to frictionally retain the screw in any position of adjustment. Manifestly, the openings **16***b* are sufficiently large to allow the end portions **16** to shift and converge under the pressure exerted by the screw as it is adjusted inwardly, so that the connecting portion can continue to properly function in its screw retaining action.

I claim:

1. A washer of the character described, comprising; a body of resilient material having a connecting portion, and end portions at an angle to the connecting portion, said end portions having openings therein for the reception of a screw and disalined to place the body under compression when the screw is extended through both of the openings to retain the screw in the end portions, said connecting portion being bowed outwardly from the end portions, and having a transverse outwardly extending bend medially of its ends.

2. A washer of the character described, comprising; a strip of bendable material having a bowed connecting portion, and end portions at an angle to said connecting portion, said strip having openings therein at the junction of the end portions with said connecting portion, and the axes of said openings converging between the end portions.

3. A washer of the character described, comprising; a strip of bendable material having a bowed connecting portion, and end portions at an angle to said connecting portion, said strip having openings therein at the junction of the end portions with said connecting portion, and the axes of said openings converging between the end portions, and said connecting portion having a transversely outwardly extending bend medially of its ends.

JOHN H. THOMPSON.