June 2, 1964 E. J. SOLTYSIK 3,135,309

SELF-RETAINED SHEET METAL FASTENER

Filed March 1, 1961

Fig.1

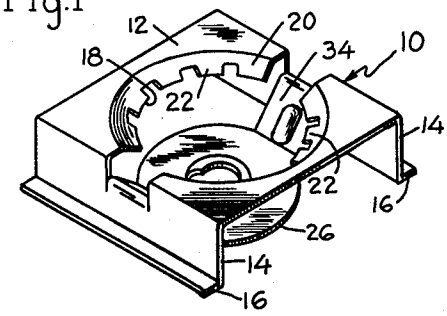


Fig.2

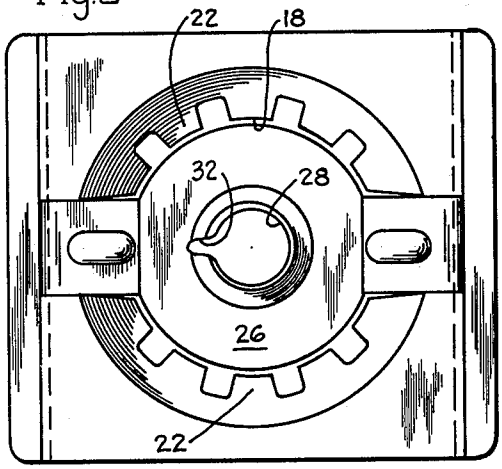


Fig.5

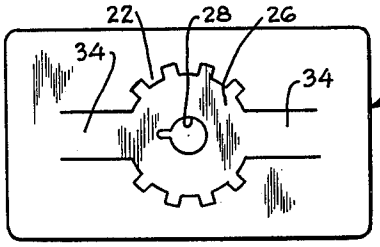


Fig.3

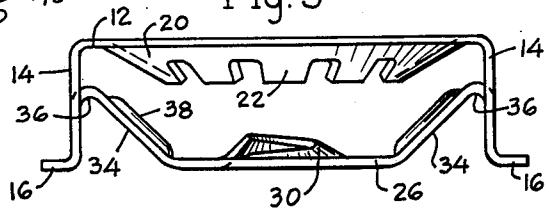
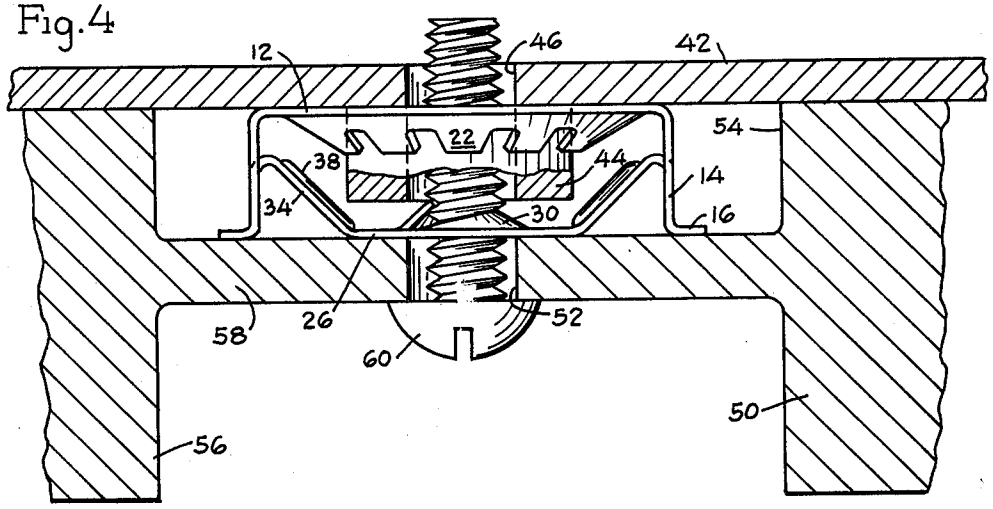


Fig.4



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ATT'Y.

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SELF-RETAINED SHEET METAL FASTENER

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This invention relates to a fastening device. More specificially, it relates to a one piece sheet metal fastener adapted to be self-retained adjacent to one workpiece and capable of accepting a second fastener for retaining a second workpiece adjacent the first workpiece.

In the art of fastening, it is a continuing problem to create fasteners for securing two workpieces in adjacent relation which can be economically fabricated and readily and rapidly installed.

It is an object of this invention to provide a device which represents a solution to the problem stated above.

Another object is to provide a one piece sheet metal fastener including self-retaining means for securing it relative to a first workpiece and which presents second means adapted to accept threaded elements for adjustable retention of a second workpiece relative to said first workpiece.

Still another object of this invention is to provide a one piece fastener which can be produced with a minimum of scrap and yet is economically fabricated by well known methods.

A further object is to provide a novel fastener installation.

Other objects and advantages of the invention will become apparent to those skilled in the art when the accompanying specification is read in conjunction with the drawings wherein:

FIG. 1 is a perspective view of a fastener constructed in accordance with the teachings of this invention;

FIG. 2 is a plan view of the embodiment of this invention;

FIG. 3 is a front elevation of the same embodiment of this invention;

FIG. 4 is an elevational view in partial section of the embodiment of this invention in installed position in a cabinet installation; and

FIG. 5 is a plan view of the flat blank of the fastener contemplated by this invention prior to forming.

Referring now to the drawings, a fastener **10** of the type contemplated by this invention includes a base **12** having a pair of depending legs **14** extending downwardly from opposed edges of the base and form therewith a generally U-shaped configuration. Each of the legs **14** is provided with a laterally disposed flange **16** which in the present embodiment are at right angles to the legs **14**. The base **12** is provided with a central aperture **18**, the inner marginal edges **20** of base **12** present a plurality of peripherally spaced toothed elements **22** which extend downwardly and inwardly and are angularly disposed relative to base **12** and supported on conically disposed marginal areas **20**.

Axially spaced from base **12** is a plate or planar member **26** shown in the disclosed embodiment as being substantially parallel to base **12**. Planar member **26** is centrally apertured as at **28** and is provided with screw thread engaging means **30**. In the embodiment shown the marginal material of planar member **26** forming the screw thread engaging means **30** is radially slotted as at **32** and helically disposed to accommodate a complementary screw. It should be understood that other known sheet metal thread engaging means can be substituted without deviating from the spirit of the invention. Planar member **26** is retained in its axially spaced position relative to base **12** by a pair of angularly disposed arms **34**. Arms **34** extend upwardly and outwardly from opposite

edges of planar member **26** and are each reversely bent at its outer end, as at **36**, to blend with a point of juncture with the adjacent leg **14**. The arms **34** may be ribbed as at **38** for additional longitudinal strength.

A fastener of the type described can be economically fabricated from a flat heat-treatable sheet metal blank **40** of the type shown in FIG. 5. The planar member **26** and the arms **34** are struck from the parent material forming base **12** and legs **14**. Substantially the only scrap involved in the manufacture of such a fastener is present in the interdential space between teeth **22** and the aperture **28** for providing the thread engaging means. This relatively scrapless method of producing the instant fastener, of course, results in the conical portions **20** with its attached teeth **22** being divided into two segments of a circle in opposed arrangement to one another due to the removal of material for the opposed arms **34**.

An installation joining a cabinet base and a leg member, which utilizes the above described fastener, can be best seen in FIG. 4. A cabinet base **42** is provided with a depending hollow boss **44** having a bore **46** comunicating between the upper surface of base **42** and the free end of boss **44**. Fastener **10** is adapted to be associated with boss **44** by the axial telescoping of the boss **44** downwardly within aperture **18** until the upper surface of base **12** is in engagement with the undersurface of cabinet base **42**. Normally, boss **44** is slightly larger in diameter than the internal diameter between opposed teeth **22** so that the teeth **22** will flex downwardly slightly and thence, because of the sharp edge presented by their angular disposition, bite into the boss **44**. The leg **50** is provided with a central aperture **52** and is counter-bored at its upper and lower end as at **54** and **56**. Counter-bore **54** is designed so as to be substantially equal to or slightly greater than the axial extent of legs **14** and flanges **16**. As can be seen, the legs **14** and flanges **16**, the latter being coplanar with planar member **26**, serve to space the intermediate portion **58** of leg **50** and the cabinet base **42**. A screw **60** complementary to screw thread means **30** is introduced through counter-bore **56** and extends upwardly through aperture **52** and bore **56** of the leg **50** and boss **44**, respectively. The cabinet leg **50** can be readily removed for shipment, should this be desired, and is capable of lateral adjustment relative to cabinet base **42** by controlling the diametral size of aperture **52** relative to the shank and head size of screw **60**. The amount of adjustment available, is, of course, a matter of choice and dependent upon the available limits of shank diameter and head size in screws.

The conical disposition of teeth **22** and the adjacent material **20** provide a lead-in for the telescopic association with boss or stud **44**, and position the teeth **22** in their optimum holding position relative to the outer surface of boss **44**. The ribbing **38** of legs **34** assists in maintaining the triangular strut action necessary to keep planar member **26** spaced from and substantially parallel to the base **12**. It should be understood, of course, and will be apaprent to those skilled in the art that, while it is not shown in the exemplary embodiment, the legs **14** do not of necessity have to be equal in length but can be dissimilar in length to accommodate situations wherein it might be desirable to place boss **44** at an angle relative to the cabinet base **42** and thus create the situation where planar member **26** would have to be angularly disposed relative to base **12**. The arrangement of the apertures in this double function clip namely spring grip retention means combined with stud retaining means in register with one another, results in a compact, economical fastener suitable for a multiplicity of uses.

Only one exemplary embodiment has been disclosed above, but it is believed that other embodiments and

variations will be readily apparent to those skilled in the art. Therefore, it is my desire that I be limited only by the appended claims.

What I claim is:

1. A one piece sheet metal fastener including an apertured base integral legs extending from opposed sides of said base and substantially normal thereto presenting in cross section a substantially U-shaped form, a flange extending laterally outwardly from the terminal edges of said legs, a screw accommodating member struck from said base member so as to provide said base aperture, said member being apertured to provide threaded convolution receiving means in substantial coaxial alignment with said base aperture, integral means extending between said legs and struck out from said base and legs for securing said member and base in spaced relation, and peripheral work impinging means along the internal margin of the base including a plurality of peripherally spaced tooth elements projecting radially inwardly into the aperture of said base to permit insertion of a workpiece from one side of said fastener, the aperture in said struck out member being adapted to accommodate a screw member inserted from the opposite side of the fastener, the diameter of the base aperture being substantially larger than the screw accommodating aperture of the struck out aperture.

2. A device of the type claimed in claim 1 wherein the margin of the aperture in said base is formed into a conical configuration to serve as a guide to facilitate mounting of a workpiece in the aperture to be engaged by said spaced tooth elements projecting into the aforementioned aperture.

3. A device of the type claimed in claim 1 wherein the flanges which extend radially outwardly from the terminal ends of said legs and the screw accommodating member struck out from said base member are substantially coplanar.

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