Dec. 19, 1967 R. A. MUNSE 3,358,729

C-TYPE FASTENER

Filed April 25, 1966

FIG. 4

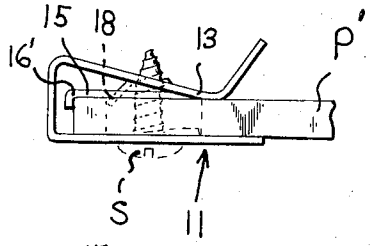
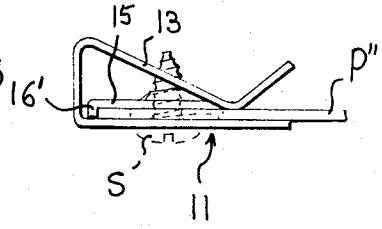


FIG. 5



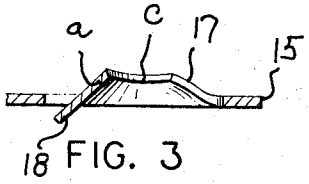
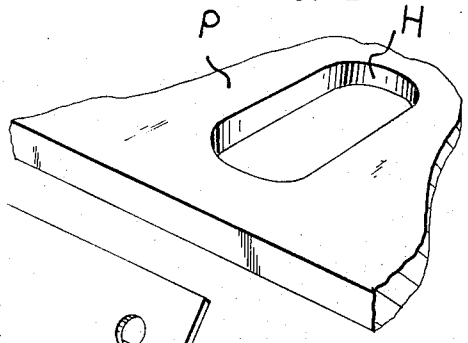


FIG. 3

FIG. 2



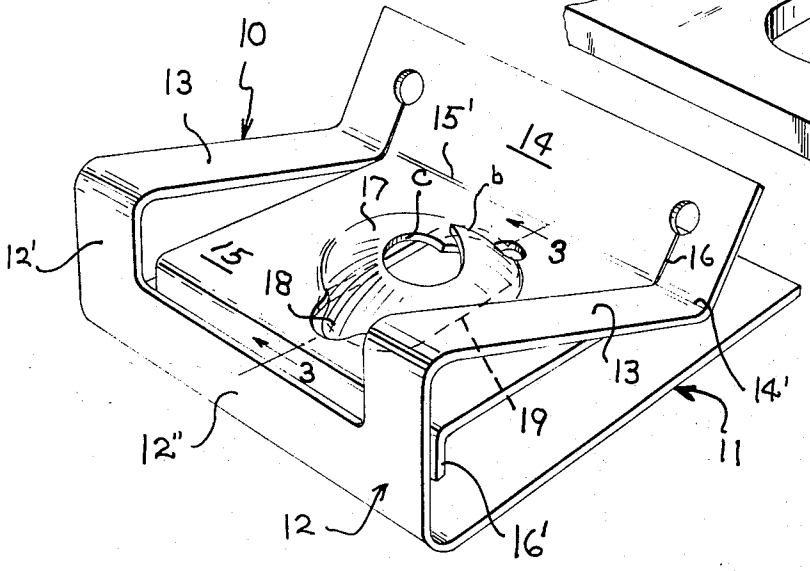


FIG. 1

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C-TYPE FASTENER

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ABSTRACT OF THE DISCLOSURE

A generally C-shape fastener is formed of a single piece of spring sheet metal bent to provide upper and lower arms joined along corresponding edges by a connecting portion which extends upwardly at about a right angle from the lower arm. The lower arm is a flat plate with a hole there through for accommodating a screw. The upper arm includes a pair of spaced strips which overlie the lower arm, which strips are each connected at one end to the connecting portion and extend therefrom towards the mouth of the C, and normally incline towards the lower arm. The ends of the spring strips remote from the connecting portion are bent upwardly along a bend line away from the lower arm to become part of an upwardly inclined panel. The panel extends across the remote ends of the strips. Integral with the panel is a main plate which has a free end portion extending back between the strips towards the connecting portion, and which overlies the lower arm. The plate bears a nut impression, and on the free edge of the plate is a downwardly extending lip which functions as a stop when the clip is engaged over a work piece. The main plate joins the panel along a bend line which coincides with the line of bend at the junctures of the spring strips and the panel, and with this arrangement the main plate always lies substantially parallel to the lower arm, regardless of the thickness of the work piece.

This invention relates to sheet metal fasteners but particularly to nut means equipped C-type fasteners for application to apertured supporting panels.

Fasteners of the C-type have heretofore been developed which are adapted to engage panels of different thicknesses and dispose the nut means in position for screw application, thereby eliminating the necessity of having individual fasteners for each panel thickness. Reference is made to the U.S. patent to Hartman et al. 2,581,481, dated Jan. 8, 1952, which shows a fastener of this character. However, prior fasteners of this type do not satisfactorily align the nut means with the panel aperture, are difficult to apply, or are complicated in design and costly to produce.

An object of this invention is to produce a new and improved C-clip of the above character which is simple and inexpensive to produce on a large quantity basis, can be simply applied to apertured panels of different thicknesses so as to embrace same with the nut means properly disposed relative to the panel aperture for screw reception, and is designed to impart substantial spring pressure against the supporting panel without militating against relatively easy application thereto.

Other objects and advantages of the invention will hereinafter appear and, for purposes of illustration but not of limitation, an embodiment of the invention is shown on the accompanying drawings, in which:

FIGURE 1 is a top perspective view of a C-clip fastener embodying the invention;

FIGURE 2 is a fragmentary perspective view of an apertured panel to which the fastener shown in FIGURE 1 is adapted to be applied;

FIGURE 3 is a fragmentary sectional elevation on the line 3—3 of FIGURE 1;

FIGURE 4 is a side elevation of the fastener applied to a relatively thick panel and showing a screw applied thereto; and

FIGURE 5 is a side elevation of the fastener applied to a relatively thin panel.

The illustrated embodiment of the invention comprises a unitary sheet metal C-type clip having an upper arm portion **10** and a lower arm portion **11**, the two arm portions being connected by an upright connecting portion **12**. The upper arm portion has a pair of laterally spaced narrow spring arms or strips **13**, which incline downwardly and forwardly from the connecting portion **12**. The forward ends of the strips **13** terminate in an upwardly and outwardly inclined transverse panel **14**, the bend lines **14'** providing the jointure between the panel **14** and the respective strips **13**.

Between the side arms or strips **13** is a main plate **15**, there being slits or slots **16** at opposite ends of the plate **15** extending into the transverse panel **14** to enhance the flexibility of the plate **15** relative to the panel **14**. The slits **16** extend transversely to suit the design, balance and strength of the panel **14** and plate **15**. The plate **15** along a bend line **15'**, which is approximately in alignment with the bend lines **14'**, is disposed in a plane substantially parallel with the lower arm portion **11**, the latter constituting a flat plate disposed at about right angles to the connecting portion **12**. The free or rearward end of the main plate **15** has a downturned lip **16'**, which is coextensive therewith and is in parallel relation to the connecting portion **12**.

Manifestly, the main plate **15** and lip **16'** are severed from the fastener body by slitting the metal along laterally spaced lines and a transverse connecting line at one end so that the connecting portion **12** has laterally spaced short vertical arms **12'** connecting respectively at their upper ends to the inclined arms or strips **13** and at their lower ends to a lower transverse panel portion **12''**.

The main plate **15** has a central nut impression **17**, which in this instance is in the form of the well-known "Prestole." As shown it has a frusto-conical protuberance *a* formed with the radial slit *b*, and a central hole *c*, the edge of which is in the form of a helix adapted threadedly to engage a screw. Struck from the base of the protuberance *a* at the front portion thereof is a downwardly extending finger **18** which serves as a locator to enter the hole in the supporting panel, as will hereinafter appear. It will be observed from an examination of FIGURE 3 that the finger **18** is inclined rearwardly to enable it to ride readily over the surface of the supporting panel.

As above pointed out, the lower arm portion **11** of the clip is in the form of a flate plate which is of approximately the same length and width as the upper arm portion **10**. Formed in the plate beneath the nut impression **17** is an elongated hole **19** so that a screw passing through the hole **19** is adapted to enter and threadedly engage the nut impression **17**.

The fastener above described is adapted to be slipped over an edge portion of a supporting panel P, which has an elongate hole H adapted to register with the hole **19** in the plate **11**. It will be understood that the ear **18** snaps into the hole H and serves as a locator to insure that the fastener will be retained on the supporting panel in the proper position for screw reception.

An important feature of the above described clip is that it is designed to grip opposite sides of a supporting panel in flatwise relation throughout a relatively wide range of panel thicknesses. The relatively narrow arms or strips **13** impose a spring tension for gripping the panel.

This is illustrated on FIGURES 4 and 5 where it will be noted that regardless of the width of the supporting panel (within reasonable limits), the panel is resiliently gripped by parallel plate members. Despite the thickness of the supporting panel the nut carrying main plate **15** engages the upper surface thereof in a flatwise manner. This insures not only the desired gripping engagement with respect to the panel but also disposes the nut impression in proper position for reception of the screw S. The clip is forced over the edge of the supporting panel until the lip **16'** abuts against the outer edge thereof at which position the locator ear snaps into the hole H and retains the fastener in such position. Thus the hole H has its inner edge spaced from the adjacent side edge of the panel a distance slightly greater than the distance between the lip **16'** and the ear **18**. When applied to the supporting panel with the main plate **15** flatly engaging the upper surface of the panel and the lower arm **11** flatly engaging the under face of the panel the nut impression **17** is in the correct position so that when the screw S is applied it will threadedly engage the nut impression **17** in a straight line.

Numerous changes in details of construction, arrangement and choice of materials may be effected without departing from the spirit of the invention, especially as defined in the appended claims.

What is claimed is:

1. In a one-piece C-type spring sheet metal fastener,

a lower arm portion in the form of a flat plate,

an upper arm portion spaced above the lower arm portion,

means integral with said upper and lower arm portions disposed at about right angles to said lower arm portion and connecting corresponding edges of said upper and lower arm portions,

said upper arm portion comprising a pair of laterally spaced spring strips inclining from said connecting portion toward and into juxtaposed relation with said lower arm portion,

a panel integral with the ends of said spring strips, said panel being inclined away from the lower arm portion and connecting with the ends of the spring strips along a line of bend,

and a main plate between the spring strips having one end integral with said inclined panel,

and a free end toward said connecting means, said main plate being normally disposed at angles with respect to both said spring strips and inclined plate and joining the latter along a line of bend constituting a substantial continuation of the first-mentioned line of bend and a nut impression, said main plate being separate from said spring strips from the free end thereof at least to approximately the line of bend along which said spring strips connect with the panel,

said main plate, in the unstressed condition of said fastener, being disposed in a plane parallel to said lower arm and with the free end spaced normally below the jointure between said spring strips and said connecting means,

whereby said main plate and said lower arm maintain substantial parallelism when gripping panels of different thickness.

2. A one-piece C-type sheet metal fastener comprising an upper arm portion, a lower arm portion in the form of a flat apertured plate, and a connecting portion disposed at about a right angle to said lower arm portion, said upper arm portion having a pair of laterally spaced spring strips inclining from said connecting portion toward and into juxtaposed relation with said lower arm portion, an upwardly and outwardly inclined panel extending from the ends of said spring strips, a main plate between said spring strips free at the inner end and joined to said inclined panel at the opposite end, said panel having slits on opposite sides of and spaced the width of said main plate respectively to enable spring flexing of the latter, said main plate being disposed in a plane parallel to said lower arm, nut means on said main plate, whereby said main plate is disposed in parellel relationship to said lower arm to grip therebetween panels of different thicknesses, and a downturned lip on the free edge of said main plate for stop engagement with the edge of the supporting panel to which the fastener is applied.

3. A fastener as claimed in claim **2** comprising a locator finger depending from said main plate adapted to enter the aperture in the supporting panel.

4. A fastener as claimed in claim **3** comprising a cutout portion in said connecting portion at the upper part thereof to provide depending extensions for said spring strips for enhancing the spring action thereof.

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