July 22, 1958 E. E. BRANDES 2,844,234

TOGGLE TYPE HOLDING DEVICE

Filed June 12, 1956

FIG. 1

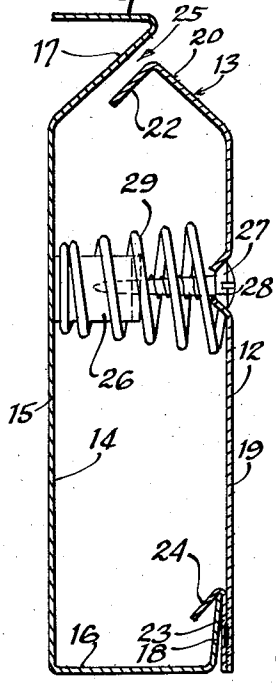


FIG. 2

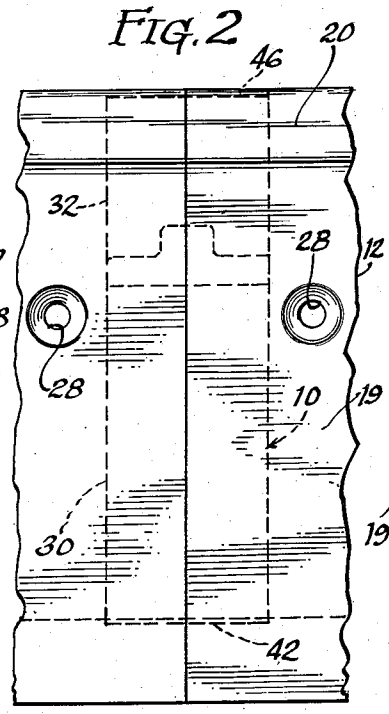


FIG. 3

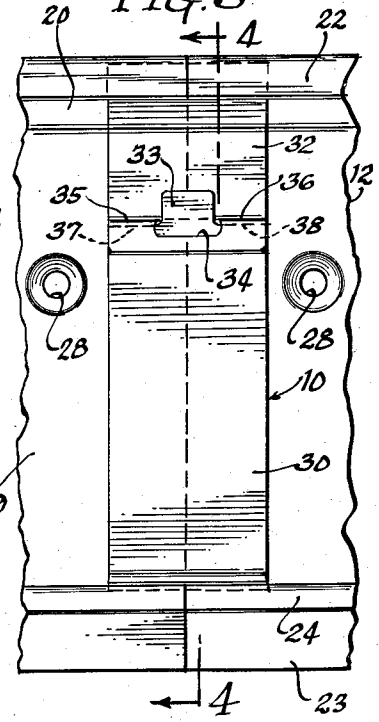


FIG. 4

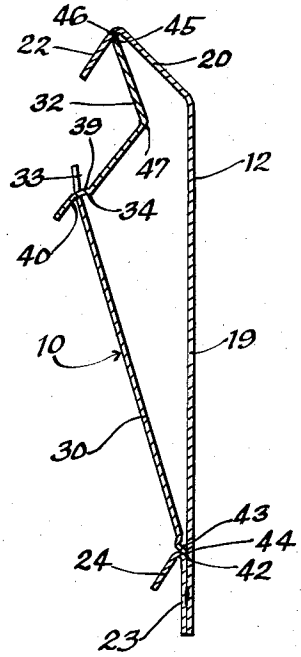
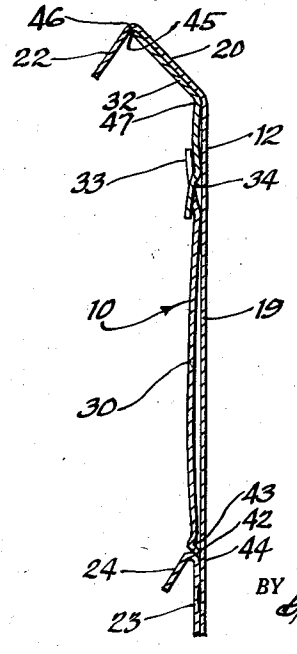


FIG. 5



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TOGGLE TYPE HOLDING DEVICE

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12 Claims. (Cl. 189—36)

This invention relates to toggle type holding devices, and more particularly such devices which are readily and quickly applied to adjacent parts for holding them in assembled relationship to one another.

One of the objects of my invention is to provide a toggle type holding device which can be quickly and easily snapped into place relative to metal parts of non-linear section for holding such parts in abutting relationship relative to one another.

As another object, my invention has within its purview the provision of a holding device having two parts hingedly engaged with one another and shaped to provide end portions adapted to fit within and have stable, resiliently held engagement with portions of predetermined sectional contour, and wherein the said two parts pass through a position affording a maximum distance between opposite ends of the two parts while being moved relative to one another for reaching the position of stable, resiliently held engagement with the members.

My invention has for another object the provision of a holding device incorporating two, hingedly connected parts, one of which parts is bowed to afford resilient flexibility thereof in a direction longitudinal to the other, and said parts together being of a size and shape to have a position of stable engagement with separated portions of the interior of a member having a sectional contour such that portions are in different planes, in which position said bowed part is compressed and resiliently holds both parts in firm contact with said member.

It is another object of this invention to provide a holding device for securing internally concave sheet metal sections of like shape in abutting end-to-end relationship by overlapping engagement with internal end marginal portions of each of the sections, so that the external surfaces of the sections are held in flush relationship and present a smooth appearance.

Other objects and advantages of the invention will be apparent from the following description and the accompanying drawings in which similar characters of reference indicate similar parts throughout the several views.

Referring to the single sheet of drawings:

Fig. 1 is a cross sectional view of one type of sheet metal section with which the holding device of this invention is adapted to use;

Fig. 2 is a fragmentary front elevational view illustrating the adaptation of a preferred form of my holding device to abutted ends of sections of the type illustrated in Fig. 1;

Fig. 3 is a fragmentary rear elevational view of the structure shown in Fig. 2; and

Figs. 4 and 5 are respectively end sectional views taken substantially as indicated by a line 4—4 and accompanying arrows in Fig. 3, and wherein Fig. 4 depicts the position of parts of the holding device during the application thereof to the abutting metal sections, while Fig. 5 illustrates the holding device in its installed position.

Although not limited thereto, the holding device disclosed herein is well adapted to use in securing together

parts of heat dispersing apparatus of the type shown and described in my United States Letters patent No. 2,627,800, issued February 10, 1953, and entitled Heat Dispersing Apparatus, and is illustrated in such an adaptation in this application.

Having reference to the accompanying drawings, the exemplary embodiment of my toggle type holding device which is shown herein for illustrative purposes is shown in an adaptation to the securement of front panel portions 12 of heat dispersing apparatus 13 in abutted relationship. To provide a general understanding of the structure illustrated, the heat dispersing apparatus 13 includes a back channel portion 14 having a back wall 15, a base portion 16, a top flange portion 17 and a bottom flange 18, all of which are integrally formed from a strip of sheet metal and which, in use, is secured to the wall portion of a building adjacent the floor in the place of a baseboard. The panel portion 12 has a relatively flat front surface portion 19 and angularly disposed top portion 20 and a flange 22 which is disposed in angular relationship to the top portion 20, said flat front portion 19, the top portion 20 and the flange 22 being integrally formed from a strip of sheet metal, and the angles between the portions being such that the inner sectional shape is generally concave. Along the bottom of the front panel portion 12, a marginal portion of the metal is folded or an additional strip is secured to the internal surface to provide an inner marginal strip 23 extending upwardly on the interior of the front panel portion and a flange 24 extending downwardly and inwardly in acute angular relationship to the strip 23. In the assembly of the front panel portion with the back channel portion 14, the bottom flange 18 on the back channel portion extends upwardly and into the angle between the strip 23 and the flange 24 to provide a hinge connection between the front panel portion and the back channel portion of the heat dispersing apparatus.

The assembly of the back channel portion and the front panel portion of the heat dispersing apparatus, as herein disclosed, forms a conduit for the dispersal of warm air through a slot type opening 25 between the top flange portion 17 of the back channel portion and the flange 22 of the front panel portion. For holding the front panel portion in place relative to the rear channel portion and for adjusting the opening of the heat dispersing slot 25 along a length of the heat dispersing apparatus, brackets such as 26 are secured to the inner surface of the back wall 15 at positions above the base portion 16 and screws 27 extend through openings 28 in the front panel portion and are threaded into the brackets 26. As herein disclosed, coil type compression springs 29 are mounted on the brackets 26 and extend therefrom into contact with the interior of the front panel portion, normally to urge the front panel portion away from the back wall of the back channel portion, whereupon adjustment of the screws 27 moves the front panel portion relative to the rear channel portion to determine the width of the slots 25.

In the manufacture of heat dispersing apparatus of the type herein disclosed, as well as other types of sheet metal parts, certain standard lengths of the parts are made, which lengths are combined and assembled at the time of installation and in the most expeditious manner to fit their place of use. In the disclosed apparatus, joints may be readily made between adjacent lengths of the back channel portions, since they are secured to the building and remain permanently in place. However, parts such as the front panel portions must be separately secured together, and for purposes such as that for which the disclosed apparatus is intended, the joints between the parts of the front panel portions which are exposed internally of the room in which they are installed should

desirably be neat and inconspicuous, as well as being firm and tight. Furthermore, the cost of labor of the class utilized for installing apparatus such as that herein illustrated promotes the desirability of providing fastening or holding devices which are readily and quickly installed without the necessity of fitting operations or tools.

The disclosed toggle type holding device **10** is adapted to ready and quick installation and mounts internally of the parts which are secured together, while those parts are in closely abutted relationship, so that a very inconspicuous joint is provided between the exposed surfaces of the parts.

As herein disclosed, my toggle type holding device **10** embodies two parts **30** and **32**, both of which are fabricated from strips of sheet metal and hingedly connected together at adjacent ends by suitable means which, in the present instance, comprises a tongue **33** projecting from the mid-portion of one end of the part **30** and narrower than the part **30**, which tongue extends loosely through a slot **34** at one end of the part **32**. With this structure and relationship of parts, side portions **35** and **36** of the part **32** on opposite sides of the slot **34** rest against side edges **37** and **38** of the part **30** on opposite sides of the tongue **33**. As depicted in Fig. 4, bends **39** and **40** in the part **32** at opposite ends of the slot **34**, as well as the looseness of the fit of the tongue **33** in the slot **34** predetermined the range of relative movement which can be attained between the parts **30** and **32**.

The part **30**, in the disclosed holding device, is longitudinally straight and has substantial longitudinal rigidity. Also, this part **30** has an end edge **42** at the end opposite the hinge connection between the parts, which edge is substantially parallel to the axis of the hinge connection. Also, as shown herein, the end marginal portion **43** of the part **30** adjacent and extending along the edge **42** is curved to fit into a groove **44** between the front surface portion **19** of the front panel portion **12** and the top bent portion of the strip **23**, which groove provides one of two opposed surfaces in spaced relationship laterally of the generally concave interior of the front panel portion **12**; the other of the spaced opposed surfaces **45** being provided at the juncture of the flange **22** with the top portion **20**.

The part **32** has an end edge **46** opposite and parallel to the axis of the hinge connection between the parts and, in order to provide flexibility and resilience of the part in a direction longitudinal thereof and normal to the hinge axis and edge **46**, the part is bowed by a bend **47** at the longitudinal mid-portion of the part.

In the disclosed adaptation, the parts **30** and **32** have a maximum combined length when the end edges **42** and **46** are aligned with the axis of the hinge connection between the parts or when those end edges and the hinge axis are disposed in a common plane. For the illustrated purpose, the maximum combined length of the parts **30** and **32** is normally greater than the distance between the opposed and spaced surfaces **44** and **45** with which the end edges **42** and **46** of the parts are engaged in use. Thus, angular disposition of the parts, as shown in Fig. 4, is required for effecting installation of the parts of the holding device between the opposed surfaces, and flexure of the part **32** is required for movement of the parts through their position of maximum combined length to the position depicted in Fig. 5, in which latter position the part **32** remains flexed sufficiently to afford a gripping and holding action against the engaged abutted ends of sections which are held thereby.

It may be observed by reference to Figs. 4 and 5 that the bowed part **32** of the holding device has an angle of curvature between its longitudinal end edges which is substantially equal to or somewhat smaller than the angle of curvature which exists between the front panel portion **12** and the top portion **20** of the structure secured thereby. Thus, after passing through the position of maximum combined length of the holding device parts **30** and **32**, at which the hinge axis is aligned with the opposite end edges, during the installation of the holding device, that device reaches a stable position of rest within the parts being held thereby and in which one portion of the part **32** engages the angularly disposed portion **20** and the other portion may engage the front panel portion **12**. In this stable and installed position, a component of the biasing force of the flexed resilient part **32** urges the upper portion of that part into contact with the angularly disposed portion **20** and other components of that biasing force are exerted toward the opposed end edges of the parts. In the disclosed structure, the lower end portion of the part **32**, adjacent the hinge axis, normally rests against or in closely spaced relationship to the panel portion **12** which is being held thereby, and the part **30** extends along and in contact with the inner surface of the front panel portion of the structure being held by the holding device.

From the foregoing description and by reference to the accompanying drawings, it may be readily understood that I have provided a holding device adapted to use for holding together like metal sections of predetermined or generally concave contour in abutted relationship, which device may be readily, quickly and easily installed, and which device fits internally of the parts held thereby and thus effects its holding connection without detriment to the appearance of the smooth exterior surfaces of the structures which it holds together.

While I have illustrated a preferred embodiment of my invention, many modifications may be made without departing from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth, but desire to avail myself of all changes within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A holding device for securing together in abutting relationship the ends of like sheet metal sections having predetermined interior contours providing opposed surfaces spaced a predetermined distance apart laterally of the sections and comprising, in combination, a relatively straight part having substantial longitudinal rigidity, and a part bowed longitudinally and having resilient flexibility between its longitudinal ends, means for providing a hinge connection between adjacent longitudinal ends of the parts and having a hinge axis extending laterally of the parts, and said parts also having opposite end edges substantially parallel to the hinge axis and engageable with said opposed surfaces of the metal sections.

2. A holding device as defined in claim 1, and wherein said means comprises a tongue extending longitudinally from one of said adjacent longitudinal ends of one of said parts in a plane offset from said one of the adjacent longitudinal ends and loosely engaged in a slot at the adjacent end of the other of said parts.

3. A holding device as defined in claim 1, and wherein the curvature of said bowed part normally conforms approximately to the predetermined interior contours of the sheet metal sections.

4. A holding device as defined in claim 1, and wherein the normal distance between said opposite end edges when the hinge axis is aligned with the opposite end edges is greater than said predetermined distance between said opposed surfaces.

5. A holding device for securing together in abutting relationship the ends of like sheet metal sections having generally concave interior contours and provided with opposed surfaces spaced apart laterally of the concave interiors of the sections and comprising, in combination, a relatively straight part having substantial longitudinal rigidity and having an edge at one end for engagement with one of said opposed surfaces, a second part longitudinally bowed to provide longitudinal resilience, and

means providing a hinge connection for movably holding the parts in end-to-end relationship to one another.

6. A holding device for use with metal parts of generally concave interior section and having retaining surfaces in opposed and predetermined spaced relationship across the concave interior from one another, said holding device comprising two hingedly connected parts having end edges substantially parallel to the axis of the hinge connection between the parts and engageable with said retaining surfaces, said parts having a maximum combined length greater than the predetermined spacing of said retaining surfaces when the axis of the hinge connection and said end edges are disposed in a common plane, and one of said parts being bowed intermediate the end edge thereof and the axis of the hinge connection to provide resilient flexibility therein in a direction longitudinal thereof.

7. A holding device as defined in claim 6 and wherein the other of said parts has a curved marginal portion extending along and adjacent to the end edge thereof.

8. A holding device as defined in claim 6 and wherein the hinge connection between the parts is separable and provided by a tongue on one of the parts which extends longitudinally of the parts through a slot in the other of the parts.

9. In combination with abutting sheet metal sections of like size and shape and having generally concave interior contours provided by angularly disposed portions and having opposed surfaces spaced apart laterally of the concave interiors of the sections, a holding device comprising two parts having adjacent end portions hingedly connected together for relative angular movements through a position of maximum combined length in which opposite ends of the parts are aligned with the axis of the hinge connection between the parts, said parts normally having a maximum combined length greater than the distance between said opposed surfaces, one of said parts having resilience and flexibility in a longitudinal direction normal to the axis of the hinge connection and the other of said parts being relatively rigid in a longitudinal direction, and one of said parts having a surface thereon for engagement with one of said angularly disposed portions of the sheet metal sections while said opposite ends of the hingedly connected parts are engaged with said opposed surfaces and after the parts have passed through their relative positions affording maximum combined length and also while said one of the parts is flexed.

10. In a combination as defined in claim 9, said parts being fabricated from sheet metal and having the axis of the hinge connection of the parts substantially coincident with the planes of the sheet metal parts.

11. In a combination as defined in claim 9, said one of the parts being bowed to afford resilience and flexibility and the other of the parts being generally flat and straight with a curved marginal portion adjacent the end opposite the axis of the hinge connection between the parts.

12. In a combination as defined in claim 9, the hinge connection of the parts being separable and provided by a tongue on one of the parts extending through a slot in the other of the parts.

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