May 20, 1958 F. J. BOLDT ET AL 2,835,359

DOOR AND HINGE STRUCTURE

Filed May 9, 1955 2 Sheets-Sheet 1

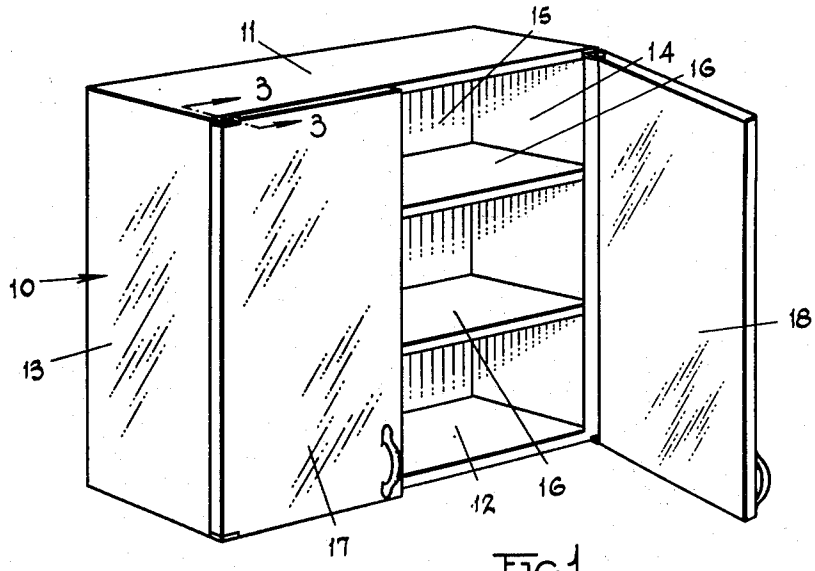


Fig 1

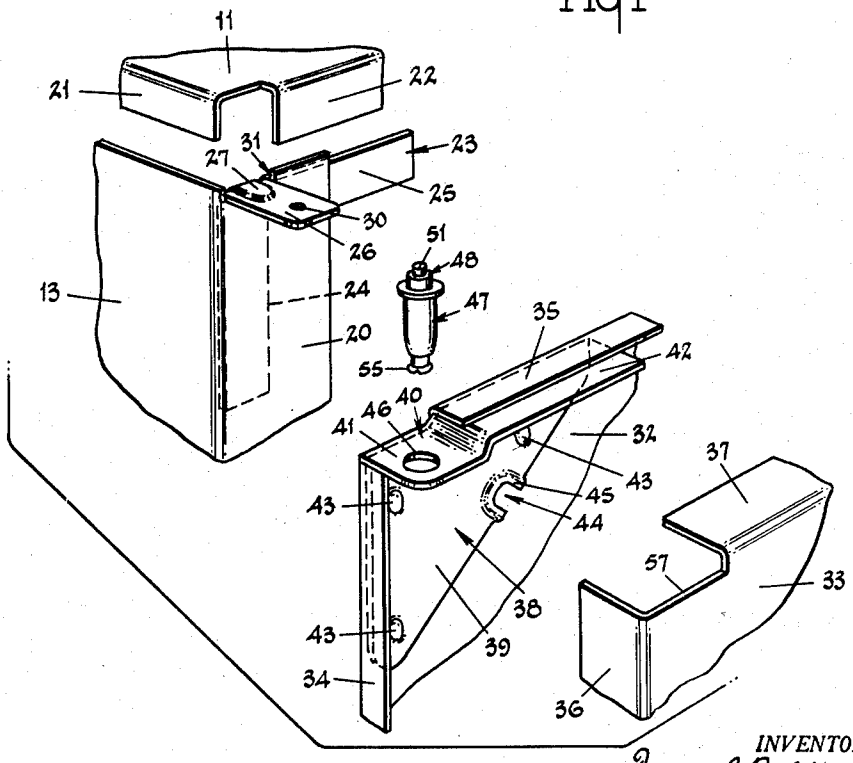


Fig 2

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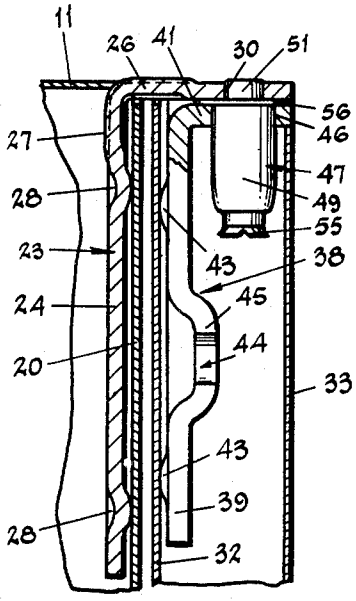


Fig 3

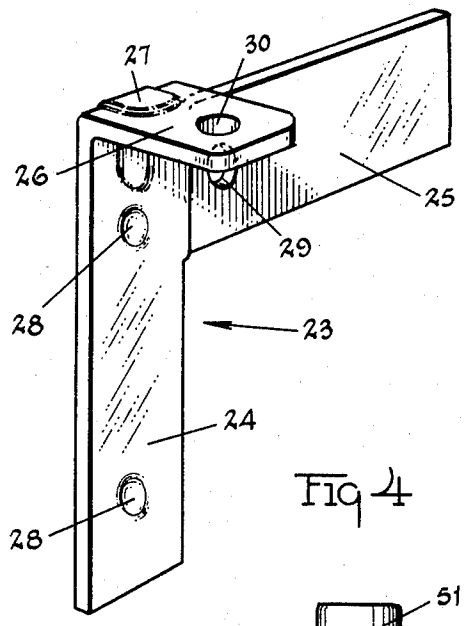


Fig 4

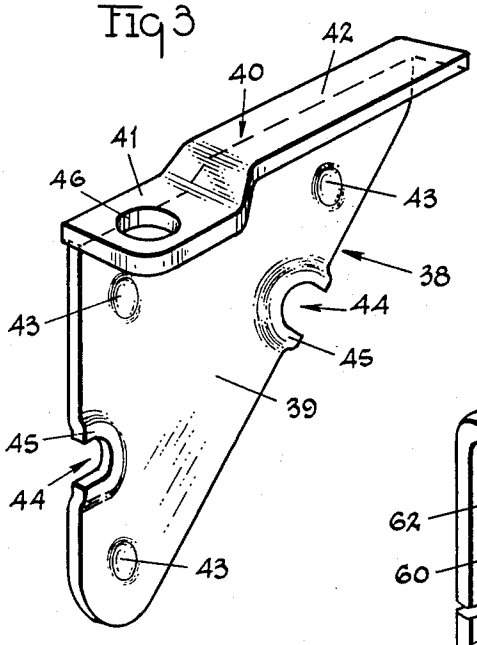


Fig 5

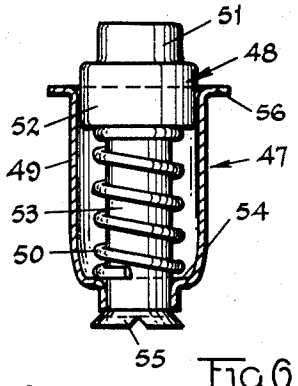


Fig 6

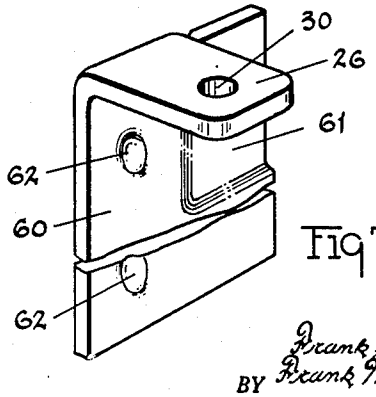


Fig 7

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DOOR AND HINGE STRUCTURE

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Application May 9, 1955, Serial No. 506,794

6 Claims. (Cl. 189—46)

This invention relates to sheet metal cabinets, and particularly to a cabinet hinge construction utilizing a removable hinge-pin assembly.

Typical composite cabinet units generally employ some form of hinging arrangement to secure the door portion or portions to the basic cabinet structure; often this hinging arrangement takes the form of a multiplicity of hinges, each hinge having a door leaf and a cabinet leaf which are pivotally interconnected by a rivet or other fastener means. In fabricating a cabinet unit of this type it is the general practice to first secure the hinges to the basic cabinet structure and then secure the door portion or portions to the hinge members. To accomplish this, the hinge cabinet leaf is fastened to the basic cabinet structure by means of screws or other holding devices and the door is then assembled to the hinge door leaf by a like method. Because of the number of separate fastening devices required to produce a rigid cabinet unit, this method of assembly requires considerable human effort, resulting in high assembly costs. In addition, considerable time and effort must be expended when it is desired to remove the doors for replacement or repair.

It is therefore an object of this invention to provide a hinge construction for mounting a door to a cabinet body whereby the door may be quickly, easily and removably assembled to the cabinet.

Basically, our novel hinge construction comprises a bracket fastened to the cabinet body and a second bracket fastened to the door. A pin is yieldingly mounted in one of said brackets and an opening is provided in the other of said brackets to receive said pin. The door is mounted by depressing the pin and bringing the pin into engagement with the opening in the door bracket.

In the drawings:

Fig. 1 is a perspective view of a cabinet utilizing the novel hinge construction.

Fig. 2 is an exploded perspective view of the hinge construction showing its relationship to the structural components of the cabinet.

Fig. 3 is a fragmentary sectional view taken along the line 3—3 on Fig. 1.

Fig. 4 is a perspective view of the bracket which is mounted on the cabinet body.

Fig. 5 is a perspective view of the bracket which is mounted on the door.

Fig. 6 is a sectional view of the pin assembly.

Fig. 7 is a perspective view of a modified form of the bracket which is mounted on the cabinet body.

Referring to Fig. 1, a typical cabinet **10** made of sheet metal comprises a top panel **11**, bottom panel **12**, side panels **13**, **14**, back panel **15** and shelves **16**. Doors **17**, **18** are hinged to the cabinet body at the corners. The cabinet body and the doors are formed of sheet metal by welding or riveting, as is well known in the art.

The novel hinge construction may be utilized at each of the front corners of the cabinet shown in Fig. 1, and for purposes of clarity only one of the hinges will be described.

As shown in Fig. 2, side panel **13** includes an inwardly projecting flange **20**, and top panel **11** includes downwardly projecting flanges **21**, **22**. A bracket **23** is mounted on the side panel. As shown in Fig. 4, the bracket **23** is generally L-shaped and includes a vertical leg **24** and a horizontal leg **25**, the latter being offset out of the plane of the vertical leg **24**. In addition, the bracket **23** includes a leaf **26** projecting from one side of the vertical leg **24** at substantially right angles thereto. The bracket **23** also includes an offset reinforcing rib **27** in the area connecting the leaf **26** to the vertical leg **24**. The upper surface of the leaf **26** (Figs. 2, 4) lies in a plane above the upper edge of the horizontal leg **25**. Integral weld projections **28** are provided in the vertical leg **24** of the bracket and a hole **29** is provided in the horizontal leg **25** to assist in locating the bracket for assembly to the cabinet body. A circular opening **30** is provided in the leaf **26** and is adapted to engage a pin for forming the pivotal connections between the cabinet body and the door, as presently described.

As shown in Fig. 2, a portion of the flange **20** on the side panel **13** is cut away as at **31** in order that, when the bracket is placed in position with the horizontal leg **25** and vertical leg **24** on the inner surface of the flange **20**, the leaf will be set into the cut-away portion **31**. The top panel **11**, including the flanges **21** and **22**, has portions thereof cut away in order that the top panel may be brought into position without interference from the bracket **23**, and with the flanges **21**, **22** in contact with the inner surfaces of the side panel **13** and flange **20**, respectively. The bracket **23** is fastened to the body by welding at the weld projections **28**, and the top panel **11** is fastened to the side panel **13** by welding.

As further shown in Fig. 2, the door **17** comprises an inner panel **32** and an outer panel **33**. The inner panel **32** includes flanges **34**, **35** and the outer panel includes flanges **36**, **37**. A bracket **38** is mounted on the inner panel **32** as presently described. As shown in Fig. 5, the bracket **38** comprises a triangular plate **39** and a flange **40** projecting from one side of the plate **39** at substantially right angles thereto. As further shown in Fig. 5, the flange **40** includes portions **41** and **42**, the portion **42** lying in a different plane than the portion **41**. The plate **38** is also provided with integral weld projections **43** for mounting the plate to the inner panel of the door. In addition, locating openings **44**, which have the peripheral edges **45** thereof offset, are provided.

An opening **46** is provided in the portion **41** of flange **40** and is adapted to receive pin assembly **47** (Fig. 3). Referring to Fig. 6, the pin assembly **47** includes a plunger **48**, a shell **49** and a helical coil spring **50**. The plunger **48** includes an upper end portion or pin **51** having a diameter substantially the same as the opening **30** in the leaf **26** of the cabinet body bracket **23**. The plunger **48** also includes an intermediate portion **52** of

greater diameter and a lower portion 53 of less diameter. The shell 49 is of substantially the same diameter as the intermediate portion 52 of the plunger 48 except at the lower end where it is restricted to the diameter of the lower portion 53 of the pin. The spring 50 acts between the intermediate portion 52 and the lower end 54 of the shell 49. The end of the plunger 48 protrudes beyond the shell and is staked as at 55, thereby limiting the movement of the plunger 48 under the action of the spring 50. As shown in Fig. 6, the shell 49 includes a shoulder 56 at the upper end thereof which is adapted to engage the area surrounding the opening 46 in the flange 40 of the door bracket 38, when the pin assembly 47 is placed in position by inserting the shell 49 in the opening 46.

As shown in Fig. 2, the portion 41 of the flange 40 projects beyond the edge of the plate 39 in order to overlie the flange 34 of the inner door panel 32, the flanges 34, 35 being cut away to accommodate the flange 40 of the bracket. The outer door panel 33 has a portion thereof and of the peripheral flanges 36, 37 cut away. The portion 41 of the flange 40 extends outwardly from the plate 39 a greater distance than the portion 42 and overlies the upper edge 57 of the notched or cut-out portion on the outer panel 33 (Fig. 2).

The bracket 38 is welded to the interior of the inner panel 32, the plate 39 contacting the panel 32 and abutting against flange 34 while the portion 42 of flange 40 abuts against flange 35. The outer panel 33 is then brought into position and welded with the flange 37 overlying and contacting flange 35 and flange 36 overlying and contacting flange 34. With the pin assembly 47 inserted in position, the door is assembled to the cabinet body by depressing the plunger 48 and sliding door and pin assembly 47 into alignment with the opening 30 of the leaf 26 on the cabinet body bracket 23. When the cabinet body and door are in proper alignment, the end or pin 51 of plunger 48 will snap into opening 30 (Fig. 3). In order to disassemble and remove the door from the cabinet body, the plunger 48 is depressed and the door is removed from its alignment with the cabinet body.

A modified form of the cabinet body bracket is shown in Fig. 7 and includes a base plate 60 having an offset portion 61 and integral weld projections 62. The bracket includes a leaf 26 projecting from the plate 60, in the same manner as in the previous form of the bracket. The leaf 26 is provided with opening 30 adapted to receive the pin 51 of the plunger 48.

It can thus be seen that there has been provided a novel hinge construction whereby the door may be readily mounted on and removed from the cabinet body with a minimum of effort and time. The hinge construction comprises a pair of brackets which are easily made from metal stampings and a pin assembly. The components of the hinge are mounted on the cabinet body and door during the manufacture thereof by the same methods as are used in the manufacture of the body and the door.

We claim:

1. In a cabinet assembly including a cabinet body and a door, the combination comprising a first bracket secured to the cabinet body, a second bracket secured to the door, said brackets being provided with overlapping flanges, each said flange being provided with an opening, said openings being in alignment, a removable pin assembly mounted in the opening in said flange on said second bracket, said pin assembly comprising a generally tubular body including a peripheral flange for mounting said tubular body in said opening in the flange of said second bracket with the axis thereof in alignment with the axis of said opening, said peripheral flange on said tubular body contacting the flange of the second bracket at the periphery of the opening in the flange and thereby preventing said tubular body from moving axially in said second flange in a direction away from said first flange, a plunger slidably mounted within said body, one end of said plunger being in the form of a pin engaging the opening in the flange on said first bracket, means for yieldingly urging said plunger in one direction toward the opening in said flange of the first bracket, and means for limiting the movement of said plunger in said one direction.

2. The combination set forth in claim 1 wherein said plunger includes an intermediate portion of substantially the same internal configuration as the internal configuration of the tubular body and an enlarged portion on the other end of said plunger opposite said pin, said means for limiting the movement of said plunger in said one direction comprising a restricted portion of said tubular body adjacent the enlarged portion of said plunger, said means for yieldingly urging said plunger in one direction toward the opening in the first said bracket comprising a coil spring surrounding said plunger and compressed between said intermediate portion of the plunger and said restricted portion of the tubular body.

3. In a cabinet assembly including a cabinet body and a door, the combination comprising a first bracket secured to the cabinet body, a second bracket secured to the door, each of said brackets being provided with an opening, said openings being in alignment, and a removable pin assembly mounted in the opening in one of said brackets and including a pin adapted to engage the opening in the other of said brackets, said pin assembly comprising a generally tubular body, a plunger slidably mounted within said body, one end of said plunger forming the pin, means for yieldingly urging said plunger in one direction toward the opening in the other said bracket, means for limiting the movement of said plunger in said one direction, and means for supporting said tubular body in one of said openings with the axis thereof in alignment with the axis of said aligned openings in said brackets, said means for limiting the movement of said plunger in said one direction comprising an enlarged portion of said plunger, said tubular body being constricted in an area adjacent said enlarged portion whereby said enlarged portion contacts said constricted portion and limits the movement of said plunger in said one direction in which the plunger is yieldingly urged.

4. In a cabinet assembly including a cabinet body and a door, the combination comprising a first bracket secured to the cabinet body, a second bracket secured to the door, each of said brackets being provided with an opening, said openings being in alignment, and a removable pin assembly mounted in the opening on the second bracket and including a pin adapted to engage the opening in the other of said brackets, said pin assembly comprising a generally tubular body, a plunger slidably mounted within said body, one end of said plunger forming the pin, means for yieldingly urging said plunger in one direction toward the opening in the other said bracket, means for limiting the movement of said plunger in said one direction, and means for supporting said tubular body in one of said openings with the axis thereof in alignment with the axis of said aligned openings in said brackets.

5. In a cabinet assembly, the combination comprising a cabinet body and a door, said body and said door each having an opening therein, said openings being in alignment, and a removable pin assembly mounted in one of said openings and including a pin adapted to engage the other of said openings, said pin assembly comprising a generally tubular body, a plunger slidably mounted within said body, one end of said plunger forming the pin, means for yieldably urging said plunger in one direction toward the other opening, means for limiting the movement of said plunger in said one direction, and means for supporting said tubular body with the axis thereof in alignment with the axis of said aligned openings, said means for limiting the movement of said plunger in said one direction comprising an enlarged portion of said plunger, said tubular body being constricted in an area adjacent said enlarged portion whereby said enlarged

portion contacts said constricted portion and limits the movement of said plunger in said one direction in which the plunger is yieldingly urged.

6. In a cabinet assembly, the combination comprising a cabinet body and a door, said body and said door each having an opening therein, said openings being in alignment, and a removable pin assembly mounted in the opening in said door and including a pin adapted to engage the other of said openings, said pin assembly comprising a generally tubular body, a plunger slidably mounted within said body, one end of said plunger forming the pin, means for yieldably urging said plunger in one direction toward the other opening, means for limiting the movement of said plunger in said one direction, and means for supporting said tubular body with the axis thereof in alignment with the axis of said aligned openings.

References Cited in the file of this patent

UNITED STATES PATENTS

1,425,995	McGivney	Aug. 15, 1922
1,564,668	Hageman	Dec. 8, 1925
2,254,755	Sand	Sept. 2, 1941
2,443,515	Rockwell	June 15, 1948