Nov. 27, 1956 O. C. GESSLER 2,771,629

CLOSURE HINGE

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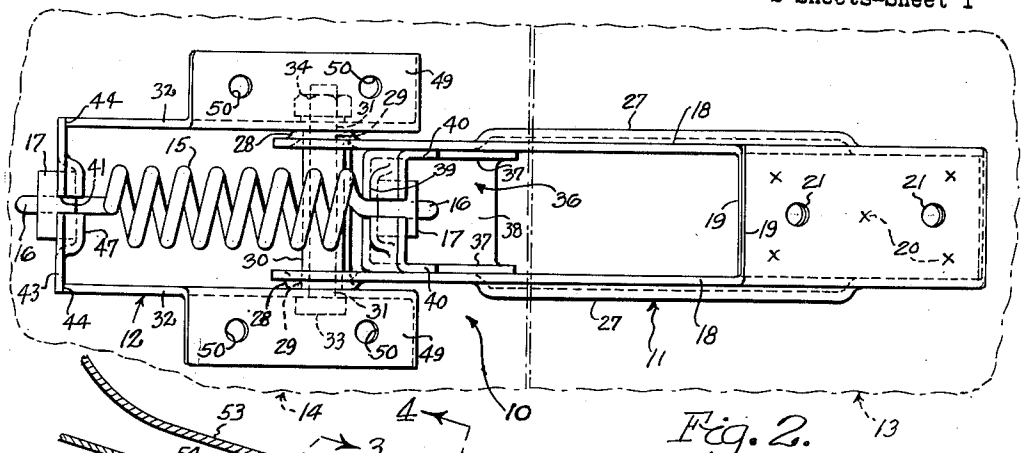


Fig. 2.

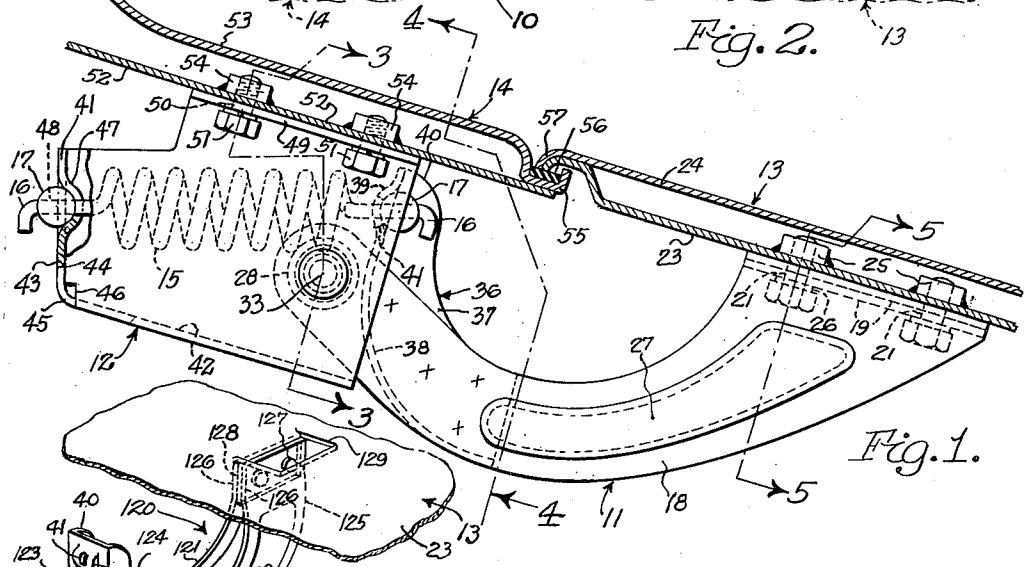


Fig. 1.

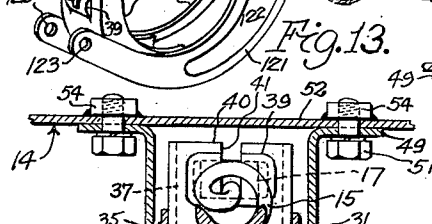


Fig. 13.

Fig. 3.

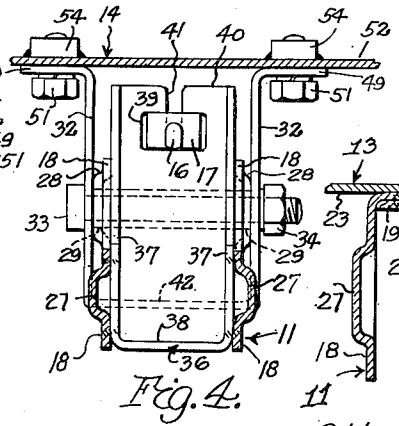


Fig. 4.

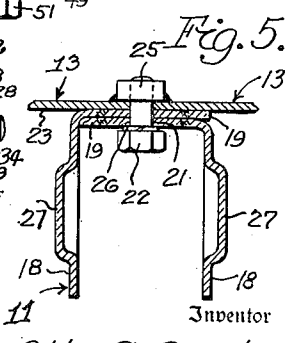


Fig. 5.

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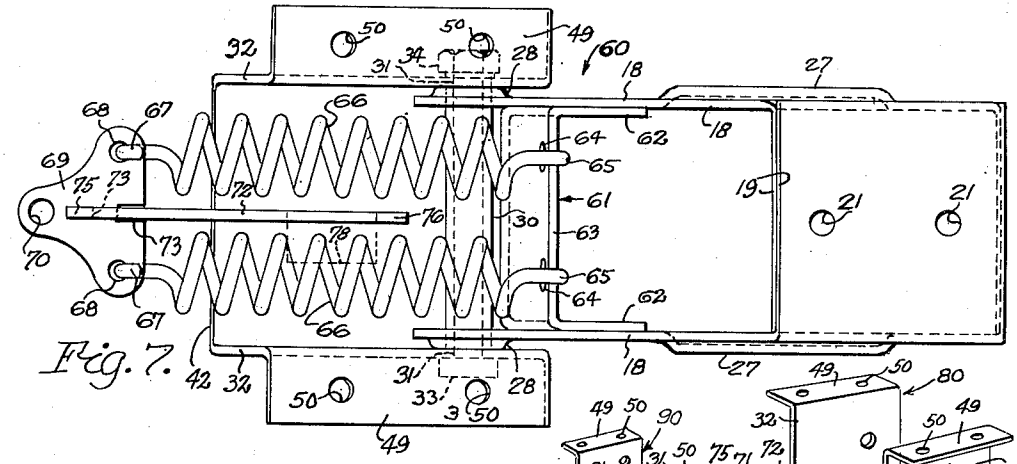


Fig. 7.

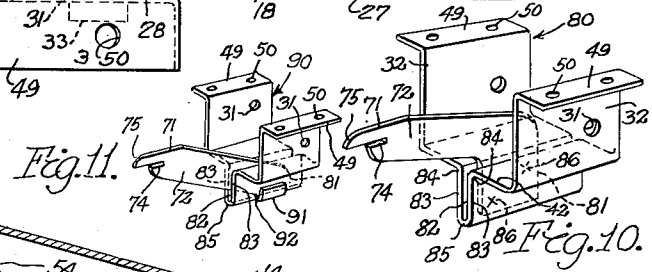


Fig. 11.

Fig. 10.

Fig. 6.

Fig. 12.

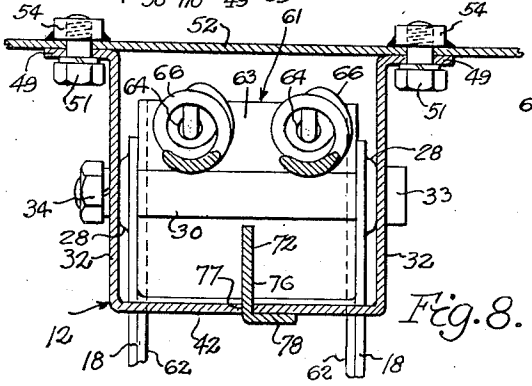


Fig. 8.

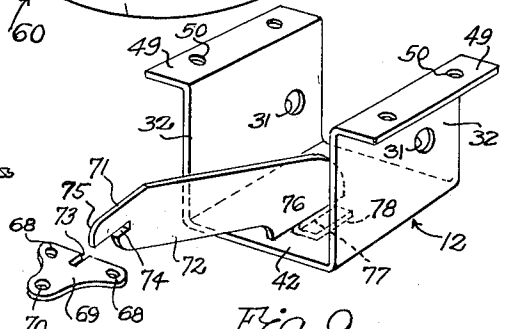


Fig. 9.

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CLOSURE HINGE

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Application March 7, 1952, Serial No. 275,263

1 Claim. (Cl. 16—190)

This invention relates to closure hinges and, in particular, to closure hinges made of stampings such as are employed in motor vehicle bodies.

One object of this invention is to provide a closure hinge which is assembled from simple sheet metal stampings which may be inexpensively manufactured individually and united by simple spot welding operations.

Another object is to provide a closure hinge of the foregoing character wherein the stampings may be produced without the need for elaborate dies or expensive equipment so that they may be made in any small stamping shop on stamping presses of moderate size.

Another object is to provide a closure hinge of the foregoing character, the parts of which are easily assembled by comparatively unskilled labor, united by simple spot-welding operations, and attached to the vehicle body by simple and inexpensive operations on the assembly line.

Other objects and advantages of the invention will become apparent during the course of the following description of the accompanying drawings, wherein:

Figure 1 is a side elevation, partly in vertical section, of a hinge, according to one form of the invention, in use with a closure lid;

Figure 2 is a bottom plan view of the hinge shown in Figure 1;

Figure 3 is an approximately vertical cross-section taken along the line 3—3 in Figure 1;

Figure 4 is an approximately vertical cross-section taken along the line 4—4 in Figure 1;

Figure 5 is an approximately vertical cross-section taken along the line 5—5 in Figure 1;

Figure 6 is a side elevation, partly in vertical section, of a hinge, according to another form of the invention, in use with a closure lid;

Figure 7 is a top plan view of the hinge shown in Figure 6;

Figure 8 is an approximately vertical section taken along the line 8—8 in Figure 6;

Figure 9 is a perspective view of the hinge bracket assembly shown in Figures 6 to 8 inclusive;

Figure 10 is a perspective view of a hinge bracket assembly according to a still further form of the invention;

Figure 11 is a perspective view of a hinge bracket assembly, slightly modified from that of Figure 10;

Figure 12 is a bottom plan view of a still further modification of the hinge shown in Figure 7; and

Figure 13 is a perspective view of a further modification of the hinge arm of the hinge shown in Figure 1.

Referring to the drawings in detail, Figure 1 shows a closure hinge, generally designated 10, according to one form of the invention and consisting generally of a hinge arm assembly 11, and a hinge bracket 12. The hinge arm assembly 11 is secured, as described hereafter, to a closure 13, such as an automobile trunk lid of convention construction, and the hinge bracket 12 is secured to the frame 14 adjoining the closure 13. Movably connecting the hinge arm assemblby 11 and the hinge bracket 12 is a

spring 15, the ends 16 of which are mounted in generally similar cylindrical rocking bearings 17.

Included in the hinge arm assembly 11 are two substantially parallel elongated arm members 18, each of which is provided at one end with a mounting flange 19 bent perpendicular to the said arm member and inwardly toward the corresponding arm member 18. When the hinge arm assembly 11 is assembled, the two mounting flanges 19 overlap each other (Figure 5) and are secured to each other as at 20 by spot welding or any suitable means. Holes 21 are bored through the mounting flanges 19 and fasteners 22 are inserted therethrough for securing the hinge arm assembly 11 to the reinforcement panel 23 located inside or beneath the outer covering 24 of the closure lid 13, holes being bored in the said reinforcement panel to receive the fasteners 22. Weld nuts 25 may be secured to the inner side of the reinforcement panel 23 to receive the fasteners 22, and lock washers 26 are also provided.

Each of the arm members 18 is dished as at 27 (Figure 2) for strengthening purposes. At the other end of each of the said arm members is a circular outwardly-dished portion 28, through which is bored a hole 29 to receive either end of a tube or bearing sleeve 30 extending between the ends of the arm members 18. Passing through the bearing sleeve 30 and through holes 31 (Figure 3) bored in the side portions 32 of the hinge bracket 12 is a fastener 33 provided with a nut 34 and a lock washer 35. By means of this fastener 33, the hinge arm assembly 11 is pivotally mounted within the hinge bracket 12.

Secured between the arm members 18 by spot welding or any suitable means is a curving spacer or spring support arm 36, U-shaped in cross-section having sides 37 and back 38 (Figure 4). This spring support arm 36 separates the arm members 18 and provides them with additional rigidity, and supports one end 16 of the spring 15 by cradling or rockingly receiving one of the rocking bearings 17 in a dished portion 39 (Figure 1) of approximately semi-cylindrical configuration, located in the back 38 near the end 40 of said spring support arm. Extending down through the back 38 and the dished portion 39 from the end 40 is a slot 41 through which the end 16 of the spring 15 passes.

The hinge bracket 12 is of approximately box-shaped configuration having the top and one end open. Besides its side portions 32, it includes a bottom 42 and a broader back or rear portion 43, the edges of which rest against the rear edges of the side portions 32 as at 44 (Figure 2) and may be welded or otherwise secured thereto, if so desired. The said rear portion is an extension of the bottom 42, which is bent as at 45 (Figure 1). The side portions 32 are notched as at 46 to permit this bending and broadening. The rear portion 43 is furnished with an inwardly-extending dished portion 47 of approximately semi-cylindrical configuration, similar to the dished portion 39 of the spring support arm 36. Cradled or rockingly received in the dished portion 47 is one of the two rocking bearings 17, the other of said rocking bearings being similarly positioned in the dished portion 39, as previously described. Either end 16 of the spring 15 is mounted in each of the rocking bearings 17 by being passed through a hole 48 in each of said rocking bearings and bent to prevent the tension of the spring 15 from withdrawing the said ends therefrom.

Each of the two side portions 32 of the hinge bracket 12 is provided with a mounting flange 49 bent perpendicularly thereto. These mounting flanges 49 are provided with holes 50 to receive the fasteners 51, by means of which the hinge bracket 12 is secured to the reinforcement panel 52 of the frame 14, located inside or beneath the outer covering 53 (Figure 1) of the said frame. Holes

are bored in the reinforcement panel 52 to receive the fasteners 51 and weld nuts 54 are secured to the inner side of the reinforcement panel 52 to receive the fasteners 51.

As previously stated, the closure 13 and the frame 14 are of conventional construction, and the frame 14 is provided with a trough 55, the bottom of which is lined with a rubber gasket 56. When the closure 13 is in a closed position, its bent edge 57 rests against the gasket 56.

In the operation of the hinge 10, let it be assumed that the parts are in their closed positions shown in Figures 1 and 2. To open the trunk, baggage compartment or other enclosure, the operator raises the lid 13 which swings upward around the pivot bolt 33 of the arm 11 as an axis. Meanwhile, the spring 15, which is under tension in the closed position of the lid 13, acts as a counterbalance for a portion of the weight of the lid 13 and therefore reduces the amount of effort which the operator is required to apply in lifting the lid 13. The curvature of the arm 17 enables it to clear the edge of the lid opening and to be swung into a raised position, permitting access to the compartment to which the lid 13 is attached.

The modified hinge construction, generally designated 60, shown in Figures 6 to 9 inclusive is shown as attached to a frame 14 and lid 13 respectively of substantially the same construction as that shown in Figure 1, and secured in a similar manner. Accordingly, similar reference numerals are employed for corresponding parts. In Figures 6 to 8 inclusive, however, a pair of counterbalancing springs are employed as described below, in place of the single spring 15 of Figures 1 to 5 inclusive. The construction of the hinge arm 11 is likewise substantially the same as in Figure 1. In Figure 6, however, the spring anchorage member 61 is of slightly different construction although still being U-shaped with sides 62 and a connecting or bridge portion 63. The latter is provided with a pair of holes 64 through which the bent rearward ends 65 of the two tension springs 66 are attached. The bent forward ends 67 of the same springs 66 are hooked through holes 68 in an approximately triangular plate 69, a third hole 70 being provided for the attachment of a spring stretching apparatus for use in assembling the device. The plate 69 is mounted on the upper and forward end 71 of an arm 72, and for this purpose the plate 69 is provided with a notch 73 (Figure 7) which engages a corresponding notch 74 in the arm end 71, the nose 75 of which projects beyond the notch 74 to restrain the triangular plate 69 against moving upward. The lower end 76 of the arm 72 is passed through a hole or slot 77 in the bottom or connecting portion 42 interconnecting the side portions 32 of the hinge bracket 12, a bent-over tab 78 engaging the bottom of the connecting portion 42 underneath the slot 77 (Figure 8).

The assembly of the hinge 60 and its attachment to the frame 14 and lid 13 of the vehicle body are similar to that of the hinge 10 of Figures 1 to 5 inclusive, except for the attachment of the springs 66 which has already been described above. The operation of the bracket 60 is also similar to that of the bracket 10 in that the two tension springs 66, being assembled in a tensioned condition, absorb a part of the effort which would otherwise have to be exerted by the operator in raising the lid 13, by counterbalancing a portion of the weight thereof.

The modified hinge bracket, generally designated 80, shown in Figure 10, is generally similar to the hinge bracket 12 shown in Figures 1 and 9, except that the spring-holding arm 72, instead of being inserted through a slot in the hinge bracket and anchored with a tab, is now provided with a straight lower portion 81 which is seated in a groove 82 formed by bending portions 83 downward parallel to one another at the bends 84 and 85 respectively. In assembly, the straight lower portion 81 is pushed downward into the groove 82 and anchored therein by spot welding, as at 86. The operation of the hinge as a whole is the same as that described in connection with Figures 6 to 9 inclusive and hence requires no repetition.

The further modified hinge bracket 90 shown in Figure 11 is identical in construction with the hinge bracket 80 Figure 10, except that the straight portion 81 of the arm 72 is additionally provided with a tab 91 at its lower end, the tab 91 being passed through a slot 92 at the bent portion or ridge 85 beneath the groove 82 and turned back upon itself to anchor the arm 72 securely in position with or without the additional aid of spot welding. The assembly and operation of the hinge bracket 90 and the operation of the hinge as a whole is the same as that described in connection with the hinge 60 of Figures 6 to 9 inclusive, hence requires no repetition.

The still further modified hinge bracket assembly, generally designated 100, shown in Figure 12 is almost identical with that of Figures 6 to 9 inclusive except that it employs only a single tension spring 101 in place of the double springs 66 and a pair of arms 102 in place of the single arm 72. The arms 102 are similarly notched at their upper ends 103 to receive notched portions 104 in the spring anchorage plate 105, which is provided with a hole 106 for receiving the hooked forward end 107 of the spring 101, the hooked rearward end 108 of which is inserted through a single hole (not shown) in the center of the U-shaped spring anchorage member 63. The arms 102, like their counterpart 72, have tabs 109 at their lower ends 110, the tabs 109 being passed through similar slots (not shown) in the bottom portion 49 of the bracket 12. The assembly, use and operation of the hinge bracket assembly 100, except for the use of a single tension spring 101, is substantially the same as that described in connection with Figures 6 to 9 inclusive and hence requires no repetition.

The modified hinge arm assembly, generally designated 120, shown in Figure 13, is for the same purpose as the hinge arm assembly 11, and is of generally similar construction except at its upper rearward end where it is attached to the lid 13. It has parallel arcuate side members 121 dished intermediately at 122 for reinforcement purposes and provided with coaxial holes 123 at their forward ends for receiving the pivot bolt 33. The spring anchorage member 124 is substantially identical in construction with the member 36 of Figures 1 to 5 inclusive and its details are therefore similarly designated with similar reference numerals and require no duplication of discussion. The rearward portions 125, however, of the arm assembly 120 are bent toward one another with substantially parallel end portions 126 which are secured as at 127 to the opposite sides of a tab 128 which is struck downward out of an opening 129 in the reinforcement panel 23 of the lid 13. The operation of a hinge equipped with the modified hinge arm 120 of Figure 13 is similar to that of the hinge 10 described in connection with Figures 1 to 5 inclusive, hence requires no repetition.

What I claim is:

A motor vehicle body hinge comprising a hinge bracket of bent sheet metal of approximately U-shaped cross-section having a pair of laterally-spaced parallel side walls with a connecting wall integral therewith and extending therebetween and with laterally-extending attachment flanges integral therewith and extending laterally from said side walls parallel to a section of said connecting wall, and a first spring anchorage on said connecting wall; a pivot element mounted on and extending between the side walls of said hinge bracket; a hinge arm structure of bent sheet metal having laterally-spaced parallel hinge arms pivotally mounted at their outer ends on said pivot element adjacent and parallel to the side walls of said hinge bracket, and having a spring anchorage member of bent sheet metal of approximately U-shaped cross-section with substantially parallel side walls connected to said hinge arms and with an integral bridge wall extending between said side walls, said spring anchorage member having a

second spring anchorage thereon aligned with said first spring anchorage; and a tension spring secured at its opposite ends to said spring anchorages and extending therebetween.

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