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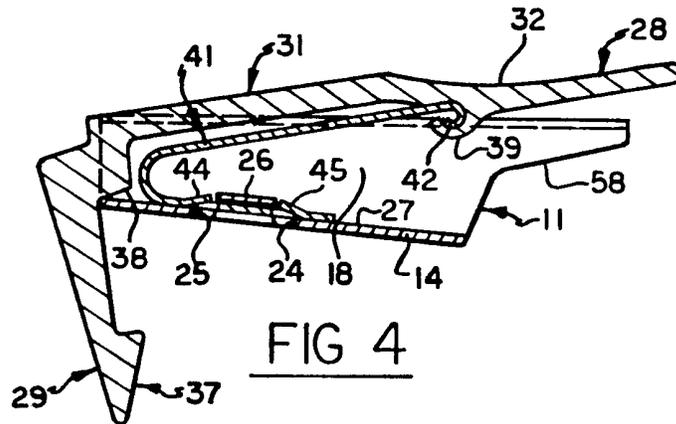
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(54) **Latch assembly**

(57) A pre-assembled latch assembly is provided with a spring mechanism 41 securing the housing 11 and pivotal member 31 together in a manner affording a unitary structure which may be shipped as assembled and handled as required before and during installation without fear that the assembly will fall apart into separate components.



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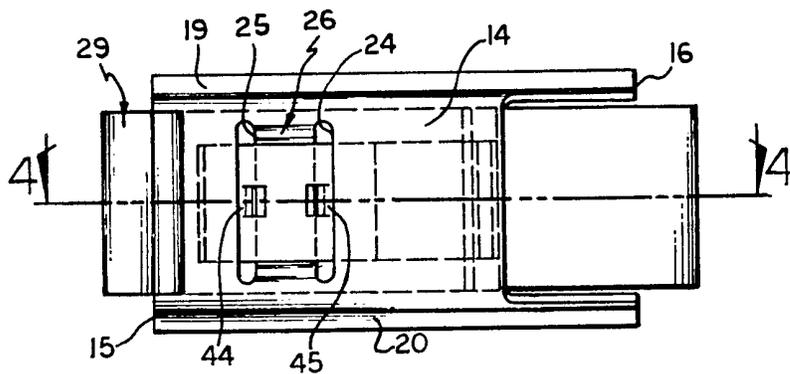
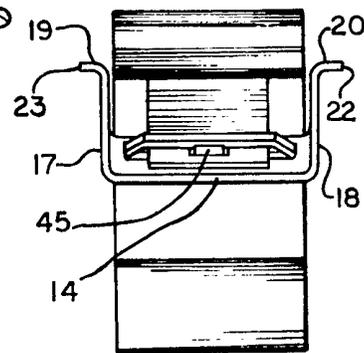
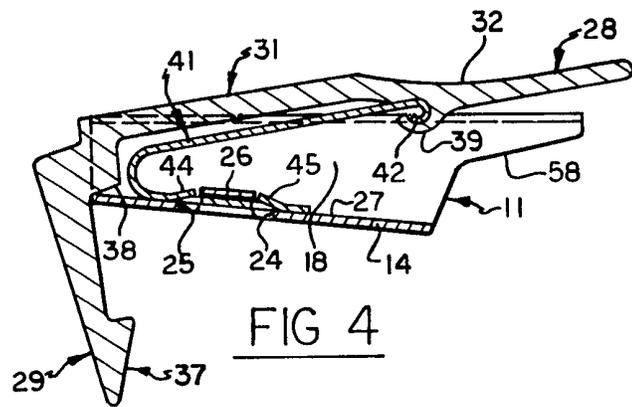
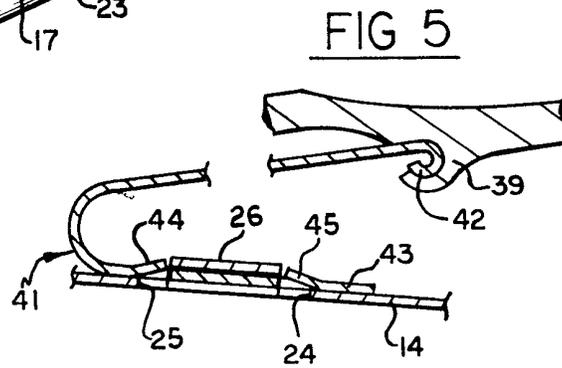
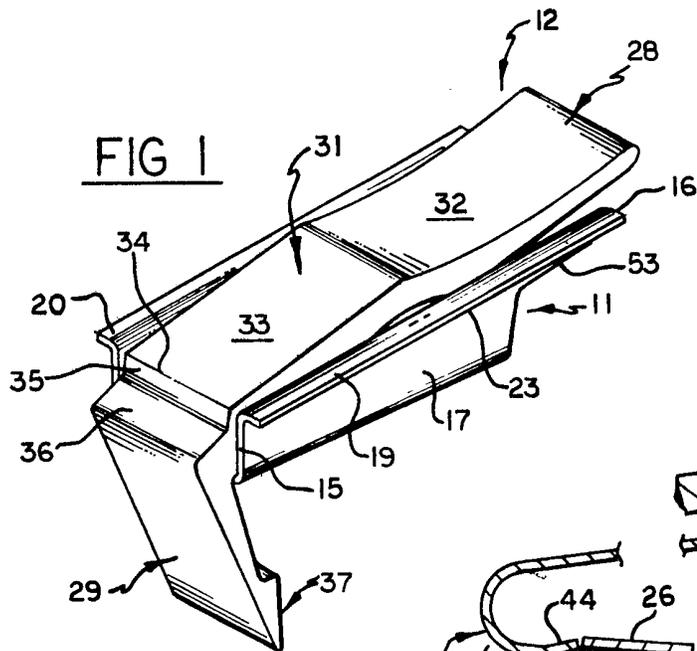
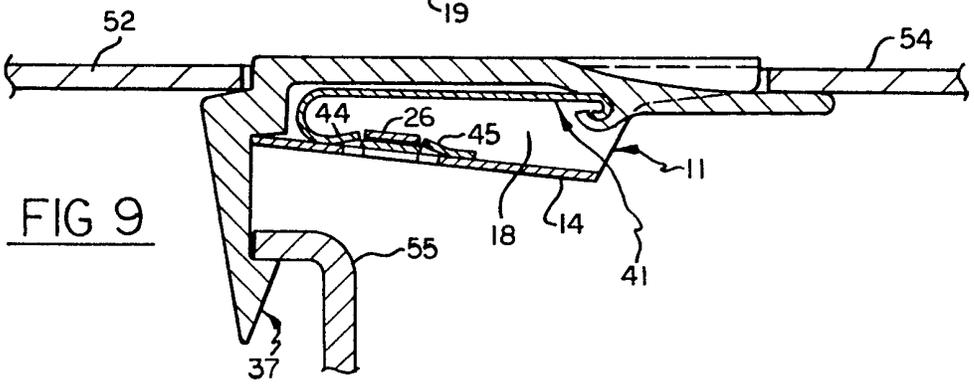
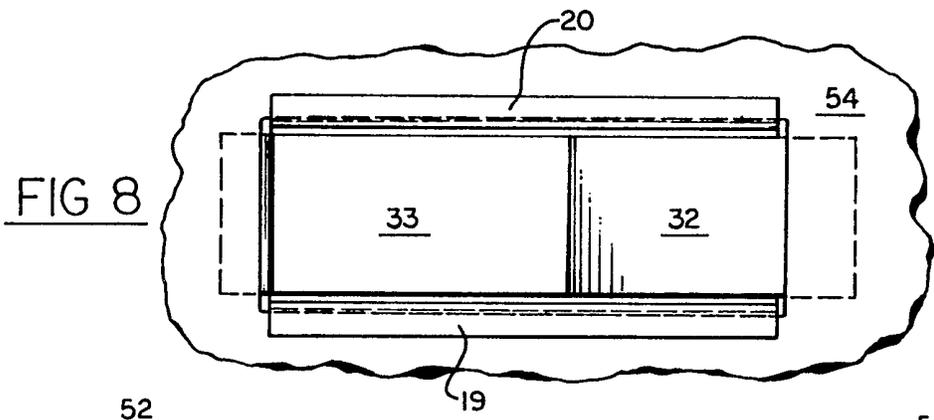
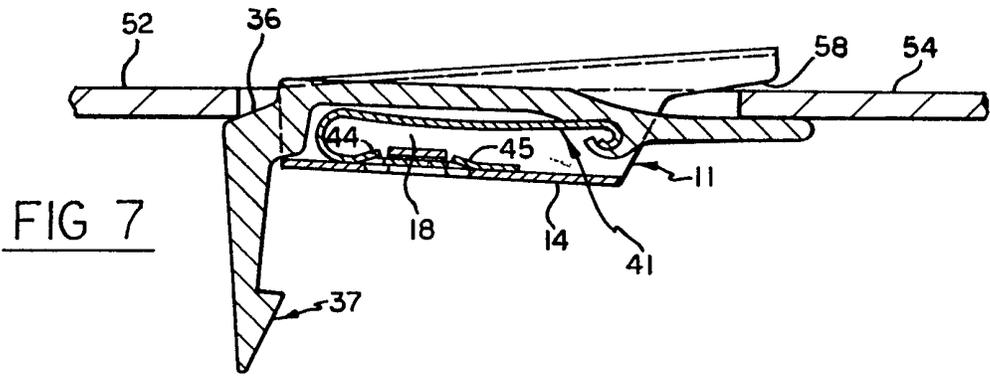
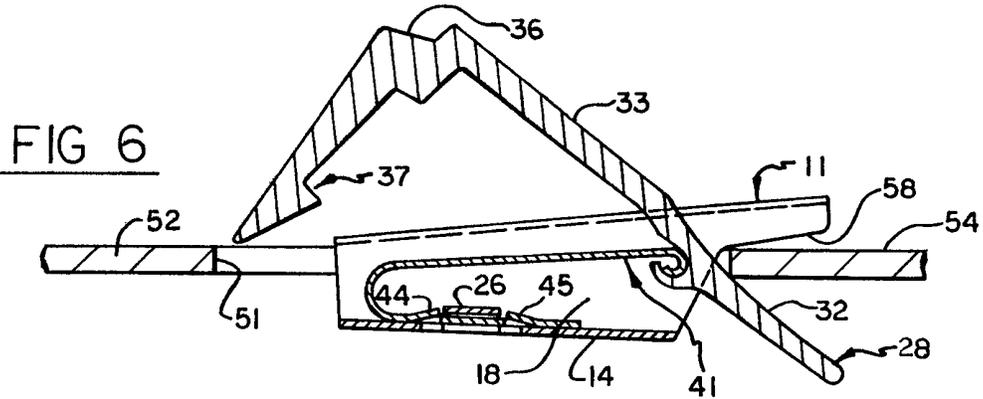


FIG 2

FIG 3



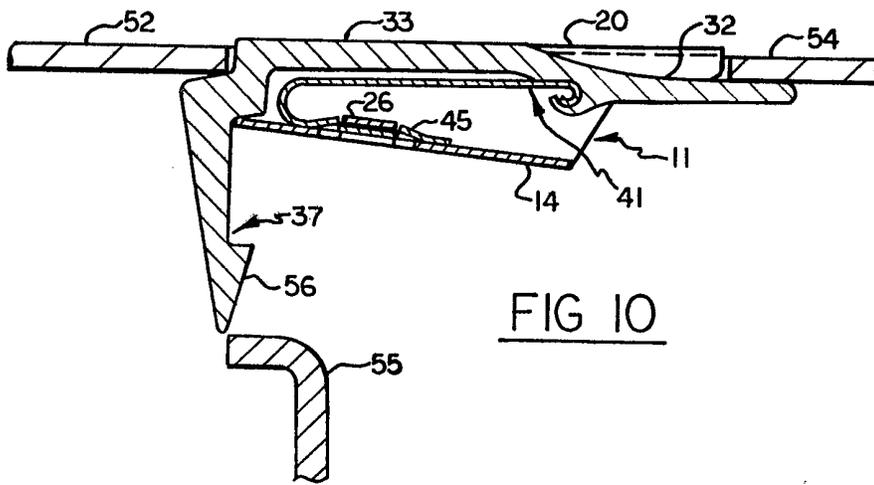


FIG 10

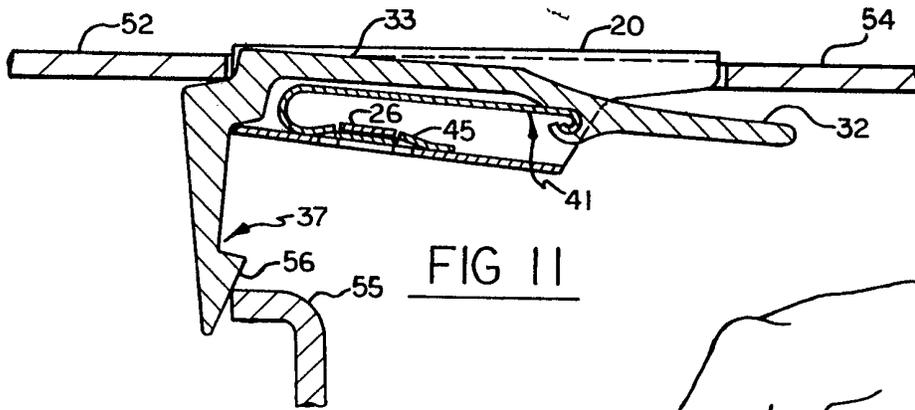


FIG 11

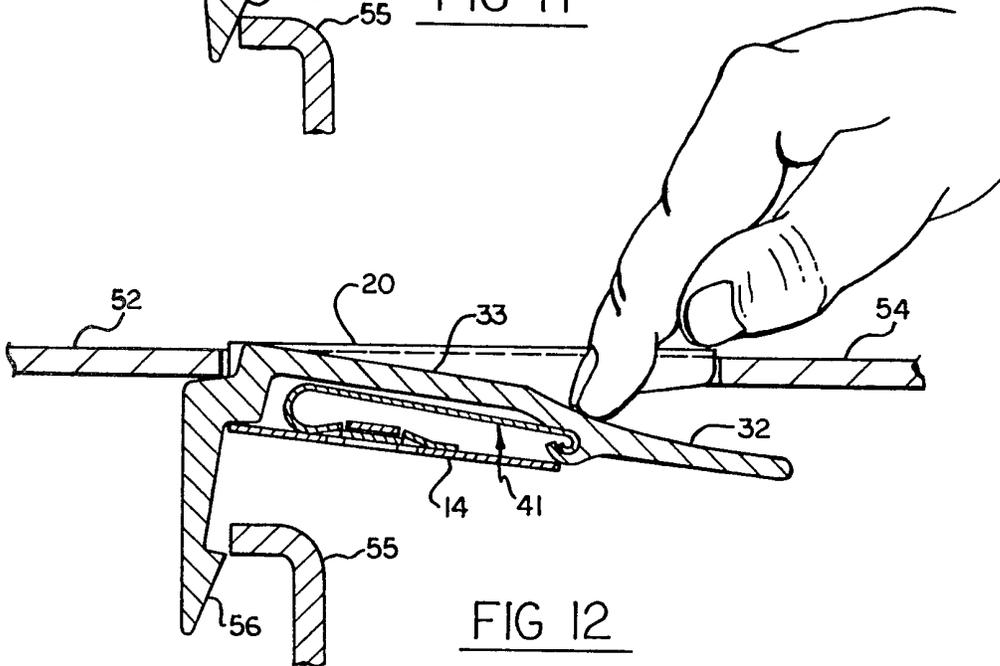


FIG 12

## SPECIFICATION

## Latch Assembly

5 The present invention relates to latches and in particular to latch assemblies which are securely pre-assembled prior to installation.

10 Despite the fact that the latch art is an old art field, advances in the state of the art continue as new applications for traditional mechanisms, i.e., latches, are created as a result of advances in other technologies, e.g., electronics, aerospace, etc. Thus, while the art field for a particular type of latch may at first  
15 glance appear to be extensively or highly developed, an apparently "small" modification in a known latch can provide a fundamentally new latch having advantages impossible with the known device. It is in such an area of  
20 development that the present invention arises.

Pin-less pivot latches having relatively simple designs and constructions are known in the art and, at one time, represented an advance in the art which was, and continues to be,  
25 well received by the purchasing public. However, such prior art devices arrive unassembled and the individual components of the latch must be skillfully manipulated in order to install the latch as desired. It is not uncommon for the installation procedure to become  
30 a rather time consuming and frustrating effort as a result of the components not being pre-assembled in any secure manner. The user lives with the fear, which is not unfounded,  
35 that the installed latch with its separate components will disassemble itself during normal use. As a result, the advantages afforded by a simplified, lower cost design are often overshadowed by the failure of the latch to remain  
40 assembled during, as well as, after installation.

The present invention is an improvement in certain known latch designs which have a minimum number of component parts and relatively low manufacturing cost associated with  
45 the design.

According to the present invention there is provided a latch assembly comprising:

50 a pivotal member having a first free end, a second free end, a generally elongated portion extending between said free ends, said second free end having a hook adapted to catch a strike, said elongated portion being constructed and arranged for pivotal movement when an external source of pressure is applied  
55 thereto;

a housing constructed and arranged to contain said pivotal member elongated portion and being adapted for interfitting engagement in an opening in a panel; and

60 means for securely assembling said pivotal member and said housing together prior to installation thereof in a prepared panel, said means including a spring positioned in said housing beneath said pivotal member.

65 Preferably, the spring is a formed leaf spring

70 which provides the mechanism for securing the pivotal member with the housing to provide the resulting assembly which can be shipped ready for installation. As such the invention is quickly installed and remains assembled during use.

A more thorough understanding of the present invention will be gained by reading the following description of a preferred embodiment with reference to the accompanying drawings in which:

*Figure 1* is a perspective view of a preferred embodiment of the present invention.

75 *Figure 2* is an end elevational view of the preferred embodiment.

80 *Figure 3* is a bottom plan view of the preferred embodiment.

*Figure 4* is a view in cross-section of the preferred embodiment as seen generally along lines 4-4 in Fig. 3.

85 *Figure 5* is an enlarged view of a portion of the preferred embodiment shown in Fig. 4.

*Figure 6* is a side elevational view in cross-section of the preferred embodiment illustrating a first step in the installation procedure for the invention.

*Figure 7* illustrates a step in the installation procedure which is subsequent to that shown in Fig. 6.

95 *Figure 8* is a top plan view of the preferred embodiment installed in a representative panel.

*Figure 9* is a side elevational view in cross-section of the preferred embodiment installed and latched in a representative panel and strike arrangement.

*Figure 10* illustrates the relative position of a portion of the preferred embodiment during the latching procedure.

100 *Figure 11* illustrates a position subsequent to that shown in Fig. 10 of the preferred embodiment just prior to the conclusion of the latching procedure.

*Figure 12* illustrates the preferred embodiment as it would appear during the unlatching procedure for the present invention.

The construction of the preferred embodiment of the latch assembly will be described with reference to Figs. 1-5. The invention is a latch assembly which is pre-assembled prior  
115 to installation. Even though it has three basic components, the preferred embodiment is a unitary assembly affording manufacture, shipping, installation and operating advantages not satisfied nor achieved by known prior art devices.

120 Each assembly includes a housing or cage 11, a pivotal member or lever 12, and a spring mechanism. The housing 11 has a bottom wall 14, an open first or forward end 15, an open second or rearward end 16, a pair of upstanding, opposing side walls 17, 18 formed integral with the bottom wall 14, and a flange 19, 20 at the uppermost portion of each side wall 17, 18 respectively. Each  
125 flange 19, 20 terminates in a free end edge

22, 23 respectively which are directed in opposite directions from each other. See Fig. 2. The side walls 17, 18 are substantially parallel to each other, and the flanges 19, 20 preferably lie in the same plane which is substantially normal to the side walls. The bottom wall 14, however, in the preferred embodiment is constructed so as to slope downwardly from the forward end 15 to the rearward end 16 of the housing. Accordingly the height of each side wall 17, 18 increases from the housing forward end 15 to the rearward end 16. As can be seen in Fig. 4, a portion of each of the side walls 17, 18 nearest the rearward end 16 is removed so as to form a notched area. In the bottom wall 14 a pair of like, elongated slots 24, 25 is deformed upwardly so as to lie above the inside surface 27 of the remaining portions of the bottom wall 14.

The pivotal member 12 of the preferred embodiment has a first free end 28, a second free end portion 29, and an elongated body 31 extending between the ends 28, 29. Proximate the first free end 28, a portion 32 of the body 31 is formed so as to be concave or arcuate in form relative to the remaining substantially flat portion 33 of the body. The concave portion 32 provides a depressed area for placement of the operator's thumb or fingers during the unlatching process. The flat portion 33 proximate the second end 29 terminates in a free edge 34 from which a generally vertical surface 35 extends to a lower, generally horizontal surface 36, forming an indented or shoulder area for the pivotal member 12. Extending downwardly from the shoulder area is a catch or hook 37 of conventional design and purpose to be explained hereinafter. The free end portion of the surface 36 may be curved in order to enhance pivot movement along the surface 36.

The pivotal member 12 is constructed so that the body 31 fits within the housing 11 between the side walls 17, 18 without binding.

The underside of the pivotal member 12 includes a ledge 38 which rests upon the bottom wall 14 at the forward end 15 of the housing 11. Beneath the concave portion 32, the pivotal member of the preferred embodiment is provided with a hook-like extension 39 for receiving a portion of the spring mechanism therein.

Securing the housing 11 and the pivotal member 12 together and thus forming the unique assembly of the present invention is a spring mechanism 41. In the preferred embodiment a rectangular, length of spring metal is formed into a leaf spring. One free end 42 is formed so as to fit within the hook-like extension 39 of the pivotal member and thus be secured therein. The other free end 43 of the spring 41 is passed beneath the raised portion 26 and positioned so as to lie flat along the inside surface of the housing bottom

wall 14. Preferably a portion of the spring 41 near the second end 43 is punched so as to form an opposing pair of lip-like flaps 44, 45. These flaps 44, 45 may be deformed upwardly so as to catch the raised portion 26 therebetween and thus secure the leaf spring in position along the bottom wall 14.

The resulting assembly provides a unitary structure which may be shipped as assembled and handled as required before installation without fear that the assembly will fall apart into separate components.

Turning now to Figs. 6-8, the installation of the preferred embodiment in a conventional panel or door may now be described. Into a prepared opening 51 in a panel 52 the housing 11 is partially inserted with the first free end 28 and concave portion 32 of the pivotal member 12 extending below the panel 52. A surface 53 of the notched area of the side walls 17 and a like surface 58 of the side wall 18, rests upon the panel's opening edge as shown in Fig. 6. With the assembly so positioned the hook portion 37 of the pivotal member may be inserted into and through the opening 51. When the assembly is almost installed as illustrated in Fig. 7, the spring 41 will be momentarily compressed. The installer merely guides the housing 11 forward until the flanges 19, 20 rest flush against the panel top surface 54 along the edge surfaces of the opening 51. Simultaneously the surface 36 of the pivotal member shoulder area rides along the forward edge of the panel opening 51. The latch assembly comes to rest securely within the panel opening 51 and when latched appears in cross-section as shown in Fig. 9. The installation procedure is quick and without aggravation as there are no loose components in the latch assembly of the present invention. Thus, the pre-assembled latch assembly provides a reliable latch which is readily installed without problems.

When it is desired to secure the installed latch to a provided strike 55, i.e., to close the panel opening, the panel need only be slam closed as shown in Figs. 10-11. A surface 56 of the hook 37 rides along the strike 55 as a result of the pushing force. The spring 41 is compressed as a result of the pivotal member pivoting in a clockwise direction about the shoulder area. As the strike passes the upper edge of the hook surface 56, the hook snaps into position beneath the strike 55, thus securely latching the panel 52 closed.

To unlatch the invention, the user merely places a downward force upon the depressed or concave portion 32 of the pivotal member. This in turn causes the pivotal member to pivot and rotate the hook away from the strike 55. See Fig. 12. With the hook 37 free of the strike 55, the panel 52 may be opened.

From the foregoing description of the preferred embodiment it can be appreciated that

the described latch assembly provides an advance in the state of the art which solves the problem of the known devices claiming simplicity and low cost manufacture. The latch assembly is of simple design and provides the critical new feature of a reliable pre-assembled latch assembly which will not accidentally disassemble during installation and use.

#### 10 CLAIMS

1. A latch assembly comprising:
  - a pivotal member having a first free end, a second free end, a generally elongated portion extending between said free ends, said second free end having a hook adapted to catch a stroke, said elongated portion being constructed and arranged for pivotal movement when an external source of pressure is applied thereto;
  - a housing constructed and arranged to contain said pivotal member elongated portion and being adapted for interfitting engagement in an opening in a panel; and
  - means for securely assembling said pivotal member and said housing together prior to installation thereof in a prepared panel, said means including a spring positioned in said housing beneath said pivotal member.
2. A latch assembly substantially as herein described with reference to the accompanying drawings.