AUTOMATIC CLOSURE SEAL

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References Cited
UNITED STATES PATENTS
1,086,962 2/1914 Weiss ................................. 49/308
1,313,799 8/1919 Dillard et al. ...................... 49/308
1,914,158 6/1933 Perkins .............................. 49/308

FOREIGN PATENTS OR APPLICATIONS
75,554 9/1949 Norway .................................. 49/308

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ABSTRACT

The present closure seal is mounted completely along an edge of a closure such as a door, window or the like and with the closure in its open position, the seal is spaced from a sill, but upon the closure being in its closed position, the seal automatically engages the sill sealing off the space between the closure and the sill.

4 Claims, 7 Drawing Figures
AUTOMATIC CLOSURE SEAL

The present invention is concerned with a sealing mechanism for an opening closure.

The principal object of the present invention is to provide a sealing mechanism for closures which will automatically provide an effective seal at an edge of the closure only when the closure is in its closed position within an opening, but will retract towards the closure when the closure is moved from its closed position.

A further and important object of the invention is to provide an automatically operated sealing mechanism for doors which can be readily installed or removed from the door without requiring the removal of the door from its supporting hardware and which mechanism does not operate to open its sealing position until the leading edge of the door lock side is in juxtaposition to the approaching edge of the strike jamb of the door frame and does not complete the maximum sealing position thereof until the door is closed by the lockset hardware.

A still further important object of the invention is to provide an automatically operated door sealing mechanism having a minimum number of parts to reduce the weight and wear thereof and in which the sealing elements thereof extend out beyond the edges of the door panel to further provide an effective closure at the corner openings between the door panel bottom and the sill.

Another object of the invention is to provide means for forming an acoustical seal between a door bottom and a sill when the door is in its closed position to substantially reduce the transmission of sound energy therethrough and in which the acoustical seal moves in a downward direction towards the sill when moving to its sealing position to assure uniform compression of the seal and positive abutment of the seal with adjacent acoustical seals installed at the jamb of the door frame as well as ease in adjusting the outward projection and the amount of compression of the seal at such times.

Further objects of the invention will be in part described and in part obvious from the following detailed description of the accompanying drawings, in which:

FIG. 1 is a perspective view of the lower portion of a door opening and a door with the present sealing mechanism mounted thereon and in its retracted position.

FIG. 2 is an enlarged sectional view taken on line 2—2 of FIG. 1.

FIG. 3 is a sectional view taken on line 3—3 of FIG. 2.

FIG. 4 is a sectional view similar to FIG. 2, but with the sealing mechanism in its sealing position.

FIG. 5 is a further enlarged cross-sectional view taken on line 5—5 of FIG. 4.

FIG. 6 is an enlarged cross-sectional view taken on line 6—6 of FIG. 4.

FIG. 7 is an enlarged cross-sectional view taken on line 7—7 of FIG. 2.

Referring now more particularly to the accompanying drawings, wherein like and corresponding parts are designated by the same reference characters, A refers to a building wall such as a drywall for example, B is a hinge jamb, C a hinge pivotally connecting door panel D to said hinge jamb, E is a strike jamb for receiving the free leading or lock side of said door panel, F is the bottom edge of said door panel slightly spaced from sill G. The above are conventional parts of a door opening and door therefore.

The present sealing mechanism has an end plate 1 with a slot 2 in its exterior face, recess 3 of the same width as and in line with slot 2, in its bottom edge and screws 4 extending through said end plate.

A second end plate 5 has a slot 6 in its exterior face, recess 8 of the same width as and in line with slot 6, in its bottom edge, opening 7 through the upper portion of said plate.

Back plate 9 is of an inverted L-shaped configuration having top plate 10 integral therewith. Top plate 10 also has flange 11 at its free edge. The bottom portion of said back plate has a stepped edge provided by the inwardly extending ledge 12 and marginal portion 13 normal to said ledge. The interior face of said back plate has slots 14 which are threaded at their ends thereof. Further said back plate has ribs 15, 16, and 17 extending inwardly from and normal to the interior face of said back plate. Ribs 15 and 17 provide a guide slot, while ribs 16 and 17 have a pair of connecting ribs 18 spaced apart along the length thereof each with a threaded opening 18a.

A front plate 19 has a top normal flange 20, ledge 21, marginal portion 22 normal to said ledge and slots 23 in the interior face of said front plate which are threaded at their ends.

Screws 4 of end plates 1 and 5 are in threaded engagement with the threaded ends of slots 14 and 23 of said back and front plates for retaining the same together.

A sealing strip 24 of a resilient material such as rubber, plastic or the like, has bottom ribs 25 and a top portion 26 of reduced cross-section.

A channel shaped retainers 27 has side walls 28 and 29 slideable between front and back plate marginal portions 22 and 13 with sealing strip top portion 26 inserted between said side walls. Also retainer 27 slideably extends through recesses 3 and 8 of said end plates.

A pair of L-shaped tongues 30 and 31 are each fixedly mounted as by welding or the like to opposite top end portions of retainer 27 with tongue 30 slideable in slot 2 and recess 3 of end plate 1 and tongue 31 slideable in slot 6 and recess 8 of end plate 5.

A closure plate 32 has an opening 33 in the top portion thereof, screws 34 therethrough into threaded openings in end plate 5 for superimposed attachment thereto, a cam 35 slideably positioned in openings 7 and 33, a pin 36 extending through said closure plate, opening 33 and cam 35 pivotally retaining said cam and a bottom recess 37 through which retainer 27 slideably extends.

A pressure bar 38 is slideably positioned between ribs 15 and 17 on said back plate. Block 39 is attached to the right end of said pressure bar as seen in FIGS. 2 to 4 by a bolt 40 in threaded engagement with the right end of said pressure bar. Said block is positioned in line with openings 7 and 33 of said end plate 5 and said closure plate 32 for being engaged at times by cam 35 therethrough.

A plate 41 is fixedly attached by welding or the like to and across the left end portion of ribs 15 and 17 housing coil spring 42 between end plate 1 and the left
end of said pressure bar normally holding block 39 against end plate 5 and cam 35 extending outwardly of closure plate 32 as shown in FIGS. 1, 2 and 3.

A pair of pins are fixedly attached to, spaced apart along and extending normal to said pressure bar. A pair of pressure cams 44 are pivotally attached to said back plate by bolts 46 each in threaded engagement with one of said threaded openings 18a. Each pressure cam is of an elongated length and has a slot 45 in one end in which slides one of said pins 43 while the opposite end of the pressure cam contacts the top of retainer 27.

A pair of coil springs 47 are each attached at one end by a screw 47a in threaded engagement with top plate 10 and at its opposite end by a screw 47b in threaded engagement with the top of retainer 27 tending to retain said retainer against said end plates within recesses 3 and 8 and sealing strip 24 in between marginal portions 13 and 22 as shown in FIG. 7.

Door panels D can be of wood, steel, steel clad, cement asbestos or other conventional door material and have a recess H in the lower portion thereof extending the width of the door panel, but having a narrow mouth I in the bottom of the door panel with said back and front plates housed in recess H and mouth I as shown in FIG. 5. Said door panel also has recesses J and K in the lower side portions thereof in which are seated closure plate 32 and end plate 1 respectively.

The present mechanism or elements thereof can be of aluminum, steel, nylon or the like or varying combinations thereof. Cams 35 and 44 of nylon, for example, are excellent for the present purpose.

In the use of the present sealing mechanism when mounted in a door panel D as shown in FIGS. 1 and 5, the elements of the sealing mechanism due to springs 42 and 47, are in the positions shown in FIGS. 1, 2, 3, and 7 of the drawings with the door panel D in its open position relative to the door opening as shown in FIG. 1.

Upon door panel D being pivoted towards its closed position with the leading edge of said door panel initially engaging strike jamb E, the straight side of cam 35 strikes the front face of strike jamb E and said cam begins to pivot inwardly pushing pressure bar 38 to the left of FIGS. 2 to 4 against spring 42. This action continues until the straight side of cam 35 slides on the face of strike jamb E at which time cam 35 is within closure plate 32. During this movement of pressure bar 38, pins 43 pivot cams 44 counter-clockwise from the position of FIG. 2 to their position in FIG. 4 whereby cams 44 push said retainer from its position in FIGS. 2, 3, and 7 to its position in FIGS. 4, 5, and 6 whereupon sealing strip 24 is compressed against the sill G providing a seal between the door panel and the sill.

When door panel D is pivoted from the strike jamb E as in opening the door, spring 42 pushes pressure bar 38 to the right of FIGS. 2 to 4 returning the sealing mechanism to the positions of the elements as shown in FIGS. 2 and 3. At the same time cams 44 are pivoted to their position in FIG. 2 by the movement of pins 43 to the right of FIG 2 thereupon releasing the pressure of said cams on the retainer 27 permitting springs 47 to raise said retainer and sealing strip 24 to their positions in FIGS. 2, 3, and 7. Thus the door panel can be pivoted towards its open or closed positions without sealing strip 24 rubbing sill G.

To adjust the outward projection and amount of compression of sealing strip 24, an allen wrench is inserted through opening 7 to turn screw 40 and move block 39 to or from said pressure bar. Closure plate 32 and screws 34 are removed for this purpose while the mechanism is on door D.

When desired, the sealing mechanism can be removed or installed on the door panel D by removing closure plate 32 and screws 34 or returning the same with door panel D still mounted on hinges C.

While the present closure mechanism is shown in the drawings mounted on the bottom of a door, it is to be appreciated that it can equally as well be mounted on the top or sides of the door panel or other pivoted or slideable closure member.

I claim:

1. A sealing closure comprising a wall having a door opening, a door panel for closing said opening and pivotally connected at one side to said wall, a housing mounted in said door panel having an end opening located in an opposite side of said door panel and a side opening located in a further side of said door panel, a cam pivotally mounted in said housing and extending outwardly of said housing end opening, a retainer slideably mounted in said housing side opening, a sealing strip carried by said retainer and facing outwardly of said housing, a pressure bar slideably mounted in said housing and positioned for being moved in one longitudinal direction by said cam, means operable by said pressure bar for sliding said retainer and said sealing strip in a direction towards the outside of said door panel upon movement of said cam and thus said pressure bar in said one direction, said housing having slots in the ends thereof at said further side of said housing and said retainer having tongues slideable in said housing end slots.

2. A sealing closure comprising a wall having a door opening, a door panel for closing said opening and pivotally connected at one side to said wall, a housing mounted in said door panel having an end opening located in an opposite side of said door panel and a side opening located in a further side of said door panel, a cam pivotally mounted in said housing and extending outwardly of said housing end opening, a retainer slideably mounted in said housing side opening, a sealing strip carried by said retainer and facing outwardly of said housing, a pressure bar slideably mounted in said housing and positioned for being moved in one longitudinal direction by said cam, means operable by said pressure bar for sliding said retainer and said sealing strip in a direction towards the outside of said door panel upon movement of said cam and thus said pressure bar in said one direction, said housing having a back plate, top plate, a front plate and end plates connected to the ends of said back, top and front plate, said back and front plates having marginal portions spaced apart defining said housing side opening, said end plates having slots on the exterior of said housing and bottom recesses, said retainer slideably extending through said end plate bottom recesses and tongues being carried by said retainer and sliding in said end plate slots,

3. A sealing closure as claimed in claim 2 wherein one of said end plates has an opening therethrough, a closure plate is detachably attached to said one of said
end plates and has an opening therein in line with said end plate opening, and said cam is pivotally mounted in said closure plate opening.

4. A sealing closure as claimed in claim 3 wherein said closure plate has an end recess with said sealing strip slidably extending therein.

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end plates and has an opening therein in line with said end plate opening, and said cam is pivotally mounted in said closure plate opening.

4. A sealing closure as claimed in claim 3 wherein said closure plate has an end recess with said sealing strip slidably extending therein.