Sept. 29, 1959 W. H. SALE 2,906,566

SEALING DEVICE FOR RAILWAY CAR TRUCK JOURNAL BOXES

Filed Jan. 27, 1958

Fig. 1

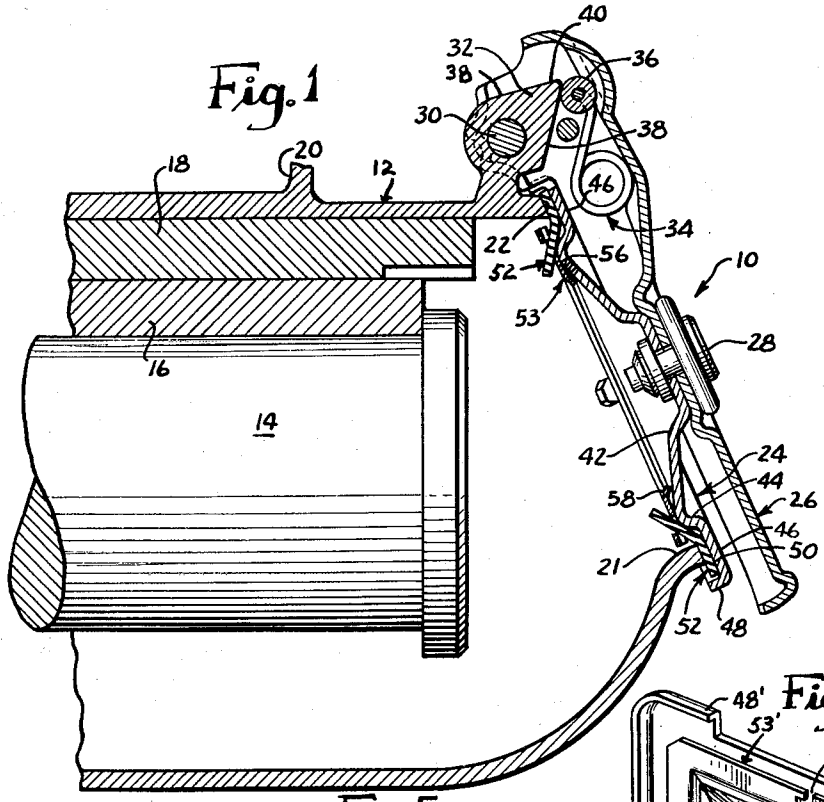


Fig. 3

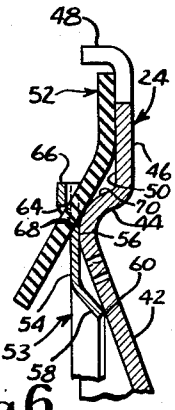


Fig. 6

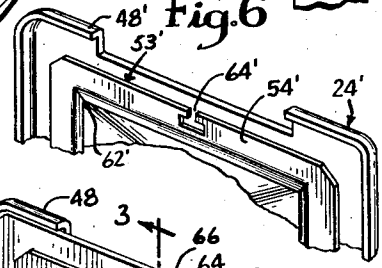


Fig. 7

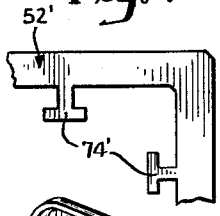
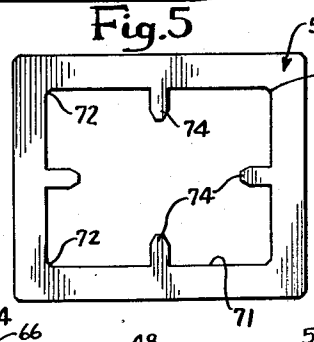


Fig. 5



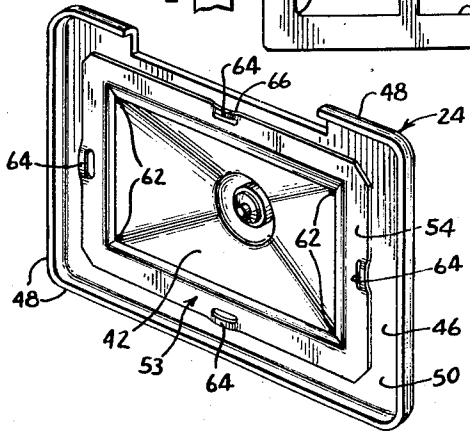


Fig. 4

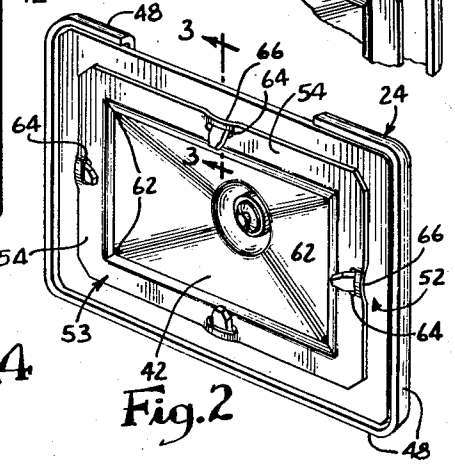


Fig. 2

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SEALING DEVICE FOR RAILWAY CAR TRUCK JOURNAL BOXES

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Application January 27, 1958, Serial No. 711,378

7 Claims. (Cl. 308—47)

The present invention relates to a journal box for the axle of a railway car truck and has particular reference to a novel means for sealing the hinged cover against the rim of the access opening of the box.

The conventional hinged journal box cover is usually in the form of a rectangular metal plate carried on a hinge pin at one side of the rectangular journal box opening and capable of being swung from an open position wherein the opening is uncovered to a closed position wherein the plate bears directly against the rim of the opening and is spring-pressed against the latter. The closure plate proper, as well as the supporting arm by means of which it is connected to the hinge pin, are usually in the form of metal castings and as a consequence the assembly is fairly massive and heavy so that at times, when the train is in motion on the roadbed, the closure member is subject to rattling due to the direct metal-to-metal contact between the inner face of the closure plate proper and the rim of the opening. Furthermore, when the train is stationary, there is a tendency for the inspector or other trainman to slam the cover shut against the journal box opening, thus annoying the passengers. This situation is particularly prevalent in connection with journal boxes associated with the car trucks of pullman cars in night service. Additionally, since the cover plates are invariably hinged on an offset pin so as to be capable of swinging movement bodily toward and away from the journal box opening, the presence of dirt or a foreign object on the rim of the opening, particularly on that side of the rim which is next adjacent to the hinge pin, will prevent seating of the cover plate on the rim of the opening, so that the opening is in fact not sealed with the cover plate remaining completely out of contact with the rim of the opening. Under such conditions not only is the journal box subject to the ingress of dirt, dust or other foreign material but the same is subject to rattling as outlined above.

The present invention is designed to overcome the above noted limitations that are attendant upon the construction and use of conventional journal box covers and, toward this end, it contemplates the provision of a novel and improved form of sealing means whereby, when the cover is swung to its closed position, it will at all times sealingly engage the entire rim of the journal box opening in such a manner that not only is the interior of the journal box sealed against ingress of dirt and the like, but also in such a manner that rattling of the journal box cover is effectively prevented.

The provision of a journal box cover having associated therewith sealing means of the character briefly outlined above being among the principal objects of the invention, a further object is to provide a journal box cover of this sort in which the sealing means is capable of being readily replaced when the same has become worn or otherwise has lost its effectiveness. In carrying out this last mentioned object the invention contemplates the provision of a novel form of sealing gasket, together with

cooperating retaining means therefor on the cover plate proper whereby the gasket may be received on the cover plate and maintained in its proper sealing position relative to the rim of the journal box opening, the cooperating retaining means on the gasket and cover plate being such that replacement of the gasket may be manually effected by the simple expedient of pulling the gasket away from the cover plate and applying a new gasket to the cover plate by a reversal of the procedure.

A further object of the invention, in a journal box cover of this character, is to provide a sealing means for the cover which is capable of manufacture as original equipment on the cover or which is capable of being applied to existing journal box covers without requiring modification or alteration of the cover plate proper or of the means whereby it is hingedly connected to the journal box.

Yet another object of the invention, in a journal box cover of this character, is to provide a novel form of sealing gasket and a cooperating retention means therefor on the cover plate wherein the retention means is of a fixed nature and is possessed of no moving parts, thereby resulting in a structure which cannot get out of order and which requires no manipulation for gasket removal or installation purposes.

Another object of the invention is to provide a journal box cover and sealing gasket therefor wherein the sealing gasket is provided with a series of positioning tongues and the cover plate is provided with a series of tongue-receiving slots therein, the cooperating tongues and slots serving to effectively retain the gasket in its operative position on the cover while the tongues themselves afford a convenient means whereby the gasket may initially be urged into proper position on the cover for subsequent alignment with the rim of the journal box opening when the cover is moved to its closed position.

A still further object of the invention is to provide a sealing means for journal box covers including a sealing gasket and retaining structure therefor wherein the gasket is capable of being applied to and removed from the journal box cover while the latter is in position on the journal box and without necessitating removal of the cover from its installed position.

The provision of a sealing means for journal box covers which is extremely simple in its construction; one which is rugged and durable and which, therefore, may be subjected to hard usage; one which is silent in its operation and which prevents rattling of the cover due to looseness; one which is comprised of but two essential parts, namely a sealing gasket and a retaining plate therefor, and which, therefore, may be manufactured at a low cost; one on which the retaining means for the gasket may be constructed in the form of a light sheet metal stamping, thereby materially contributing toward low cost of production; and one which otherwise is well adapted to perform the services require of it, are further desirable features which have been borne in mind in the production and development of the present invention.

In the accompanying single sheet of drawing forming a part of this specification, a preferred embodiment of the invention has been shown, together with a modification thereof.

In the drawing:

Fig. 1 is a sectional view taken substantially centrally and longitudinally through a railway car journal box having associated therewith the improved sealing means of the present invention;

Fig. 2 is a perspective view of the journal box cover plate proper showing the improved sealing means applied thereto;

Fig. 3 is an enlarged sectional view taken substantially

along the line 3—3 of Fig. 2 in the direction indicated by the arrows;

Fig. 4 is a perspective view similar to Fig. 2 showing the journal box cover plate proper with the sealing gasket of the present invention removed therefrom;

Fig. 5 is a plan view of the sealing gasket proper;

Fig. 6 is a fragmentary perspective view similar to Fig. 4 showing a modified form of journal box cover plate; and

Fig. 7 is a fragmentary plan view of a modified form of sealing gasket adapted to be used in connection with the cover plate of Fig. 6.

Referring now to the drawings in detail, and in particular to Fig. 1, the improved sealing means of the present invention is shown as being applied to the hinged cover assembly **10** of a journal box **12** associated with the wheel axle **14** of a railway car truck. A journal bearing or "brass" **16** overlies the axle journal **14** and a wedge member **18** is interposed between the bearing member **16** and the top of the journal box **12**, the bearing member **16** and wedge member **18** being of conventional design. The journal box **12** is of standard construction and is shown herein as being integrally cast with an end portion **20** of a truck side frame. The outer end of the journal box **12** is provided with a rectangular opening **21** which is gounded by an inclined rectangular opening against which a portion of the closure assembly **10** is adapted to seat when the latter is in its closed position on the journal box.

The closure assembly **10** is comprised of two principal parts or castings including a closure plate proper **24** and a hinge arm **26**. The closure plate **24** is generally of rectangular configuration to conform to the configuration of the rim **22** and it is riveted or otherewise secured as at **28** at its central regions to a medial point on the hinge arm **26**. The hinge arm **26** is pivotally mounted on a hinge pin **30** supported between a pair of lugs **32** integral with the journal box **12**. Spring means **34** carried by the hinge arm **26** includes a roller **36** designed for selective cooperation with a pair of angular faces **38** and **40**, respectively, for maintaining the closure assembly **10** in either its fully open or its fully closed position. The arrangement of parts thus far described are more or less conventional in its construction and no claim is made herein to any novelty associated with the same, the novelty of the present invention residing rather in the specific nature of the closure plate **24** and certain sealing means associated therewith whereby this closure plate may be caused to sealingly fit over the rim **22** of the rectangular opening **21** when the assembly is in its closed position as will be now more fully described.

The rectangular closure plate **24** is provided with a depressed central region **42** which is of wide angle dome shape and the marginal regions of which rise sharply as at **44** and merge with an elevated land portion **46** which extends completely around the peripheral regions of the cover plate and the outer peripheral edge of which is flanged downwardly as at **48**. The three portions **44**, **46** and **48** provide, in effect, a continuous marginal trough having a flat bottom **50** which provides a seat for a resilient sealing gasket **52** (see also Fig. 5), the nature and function of which will become clear presently. A rectangular retaining frame **53** of lesser overall dimensions than the dimensions of the cover plate **24** is centered on the inside face of this latter plate and is provided with a flat marginal portion **54** which bears against the base of the medial dome portion **42** as indicated at **56** in Fig. 3 and which extends outwardly so as to overlie the flat bottom **50** of the previously described trough portion of the cover plate. The inside marginal regions of the rectangular frame **53** is flanged inwardly as at **58**, the extreme inner edge of this flanged portion **58** bearing as at **60** (Fig. 3) against the inside face of the dome portion **42**. The retaining frame **53** is fixedly secured to the inside face of the cover plate **24** by the application of welds at appropriate points, as, for example, at the inside corner regions of the frame structure **53** where a series of four such welds have been designated at **62**. Each side member of the rectangular retaining frame **53** is provided near the outer edge thereof with a slot **64**, and the metal of the frame in the vicinity of the slot on the outer side thereof is raised as at **66** or offset out of the plane of the flat portion **46** so that the axis of the slot **64** is inclined relative to this flat portion **46**. The inside edge of each slot is bevelled as at **68** so that this edge, in effect, is a continuation of the inner side **70** of the trough portion to facilitate assembly of the sealing gasket **52** in position on the cover plate **24** in a manner that will be set forth presently.

The sealing gasket **52** is formed of a resilient elastomeric material, such as rubber, either natural or synthetic, or of a rubber substitute. The gasket **52** is of open rectangular design as best seen in Fig. 5 and it is shaped conformably to the continuous angular flat trough bottom **50** on the inside surface of the cover plate **24**. The gasket **52** is preferably cut or stamped from a single sheet of elastomeric material and it is provided with a central opening **71** therein of rectangular design except for the provision of filled-in corner portions **72** which are provided with reinforcement purposes, as will be described presently. Each side of the rectangular resilient gasket **52** is provided with a centrally disposed inwardly extending tongue **74**, there being four such tongues, and each tongue being designed for cooperation with one of the slots **64** provided in the retainer member or frame **52** in maintaining the sealing gasket **52** in position within the marginal trough portion of the cover plate **24**.

As best seen in Figs. 1, 2 and 3, the rectangular resilient sealing gasket **52** is received on the side face of the cover plate **24** with the body portion of the gasket lying flat against the continuous flat surface **50** which constitutes the bottom of the marginal trough as previously described, and with the tongue **74** projecting upwardly and inwardly and extending through the respective slots **64** with which they normally fall in register when the gasket is positioned on the flat surface **50**. The flat portion **54** of the retainer frame **53** overlies the body portion of the gasket **52** and, in the event that there is any tendency for the gasket **52** to adhere to the rim **22** of the journal box opening, this overlying portion will serve to pull the body portion of the gasket **52** bodily away from the rim when the cover assembly **10** is swung from its closed position to its open position. With the assembly **10** in its closed position, the rim **22** of the journal box opening bears coextensively against the body portion of the gasket **52** so that the opening is completely sealed. The tongues **74**, as well as the overlying region **54** of the retaining plate **53**, fall entirely within the rectangular confines of the journal box opening and they are thus surrounded by the rim **22** when the closure assembly **10** is in its closed position.

It is to be noted that the overall dimensions of the rectangular openings **71** provided in the sealing gasket **52** are less than the overall dimensions of the rectangular retaining plate **53** so that in assembling the resilient sealing gasket on the cover plate **24** it is necessary merely to stretch the gasket in both transverse directions in order to position it behind the overlying portion **54** of the retaining plate **53**. The assembly may be effected by roughly centering the gasket on the underneath side of the cover plate **24** and hooking one end of the gasket into the space existing between the overlying portion **54** of the plate **53** and the flat bottom **50** of the plate **24**. The tongue **74** at this end of the gasket may be threaded through the corresponding slot **64** and, thereafter, the gasket may be worked progressively around its periphery by a combined stretching and tucking operation wherein the gasket is completely pulled over the retaining plate **53**. As each side of the

gasket falls into place, the corresponding tongue **74** may be manually fed through the slot **64** with which it is in register and this threading operation is facilitated by the fact that the inner edges of the slot **64** are bevelled as at **68**, as previously described, so that they effect a continuation of the surface **70**. By such an arrangement, no sharp edges are encountered by the tongue during feeding thereof through the slots **64**. The tongues **74**, in addition to performing their retaining function in combination with the slots **64**, also provide a series of tabs which project inwardly from the slots **64** and which may be engaged by the fingers of the operator and utilized to pull the gasket into its proper final position. In other words, the tongues **74**, when threaded through the slots **64**, provide a series of tabs which may be used for straightening the gasket on the cover plate **24**.

In Fig. 6, a slightly modified form of retaining frame **53'** is shown as being applied to the closure plate **24'**, the frame **53'** being designed for use in connection with the modified form of sealing gasket **52'** shown in Fig. 7. To avoid needless repetition of description, similar characters of reference with a prime suffix have been applied to the various parts in the two views which correspond to similar parts in the form of the invention shown in Figs. 1 to 5, inclusive.

In this latter form of the invention, the slots **64'** in the retaining frame **53'** are of T-shape configuration and they are adapted to receive therein the tongues **74'** provided on the sealing gasket **52'**. These tongues are likewise T-shape. By the provision of slots **64'** and tongues **74'** both of which are of T-shape configuration, it is not necessary to thread the tongues into the slots as is the case in connection with the other form of the invention since the tongues may simply be pulled through the entrance regions of the slots **64'** which are slightly narrower than the stem portion of the tongues and the distal ends of the T-shaped tongues will interlock with the wide portion of the T-shaped slots **64'**. It will be understood, of course, that the extent of the distal ends of the tongues **74'** is slightly in excess of the corresponding portion of the slots **64'**.

In compliance with Title 35, U.S. Code, Section 112, a preferred form of the invention has been shown in the drawing and described herein, but it should be understood that the invention is not limited to the specific disclosure made, and that the appended claims should be construed as broadly as the prior art will permit.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. The combination with a railway car journal box having an access-opening surrounded by an outwardly facing rim, a cover plate hingedly secured to said journal box and having a continuous inwardly opening marginal recess conforming in outline to the outline of said rim, said cover plate being movable bodily between an open position wherein it is remote from and out of register with said access-opening and a closed position wherein it extends across said access-opening with said marginal recess in sealing register with said rim, and spring means for yieldingly urging said cover plate toward its closed position, of a continuous flat marginal sealing gasket in the form of a loop and formed of resilient stretchable elastomeric material removably disposed in and coextensive with said marginal recess and lying wholly within the confines of the latter, a flat rigid retaining plate fixedly secured to the inside face of said cover plate inwardly of said marginal recess and having its outer marginal regions projecting outwardly beyond the inner edge of said marginal recess and overlying the inner edge region of said sealing gasket, said overlying regions of the retaining plate being formed with a series of slots therethrough, and a series of tongues, one for each slot, formed on said sealing gasket and extending through said slots and serving, in combination with the slots, to retain the gasket in position within said marginal recess against transverse shifting, said retaining plate lying wholly within the confines of said rim when the cover plate is in its closed position on the rim with the outer marginal regions of the gasket sealingly engaging the rim, the modulus of elasticity of said elastomeric sealing gasket being such that the gasket may be stretched beyond the outer confines of said retaining plate for purposes of installation of the gasket on and removal of the gasket from said cover plate.

2. A journal box cover plate for closing the access-opening of a journal box, said plate being formed with a marginal rib providing a rim channel designed for register with the rim of said access-opening when the cover plate is in closed position over said opening, a flat sealing gasket in the form of a loop of resilient stretchable elastomeric material removably disposed within said rim channel, a substantially flat retaining plate secured to the inside face of said cover plate and having its outer marginal regions overhanging said rim channel and extending partially thereacross coextensively therewith so as to overlie the inner marginal regions of said gasket and retain the same against outward movement away from the inside face of the cover plate, the modulus of elasticity of said sealing gasket being such that the gasket may be stretched beyond the outer confines of said retaining plate for purposes of installation of the gasket on and removal of the gasket from said cover plate, and a series of cooperating tongue and slot connections on said retaining plate and gasket wherein the tongues extend through their respective cooperating slots to maintain the gasket against lateral shifting within said rim channel.

3. A journal box cover plate for closing the access-opening of a journal box, said plate being formed with a marginal rib providing a rim channel designed for register with the rim of said access-opening when the cover plate is in closed position over said opening, a flat sealing gasket in the form of a loop of resilient stretchable elastomeric material removably disposed within said rim channel, a substantially flat retaining plate secured to the inside face of said cover plate and having its outer marginal regions overhanging said rim channel and extending partially thereacross coextensively therewith so as to overlie the inner marginal regions of said gasket and retain the same against outward movement away from the inside face of the cover plate, the modulus of elasticity of said sealing gasket being such that the gasket may be stretched beyond the outer confines of said retaining plate for purposes of installation of the gasket on and removal of the gasket from said cover plate, a plurality of slots formed in said retaining plate and spaced from the margin thereof and in register with said rim channel, and a plurality of tongues formed on the inner peripheral edge of said gasket, one for each slot, said tongues projecting completely through said slots and serving to maintain the gasket centered within said rim channel.

4. A journal box cover plate for closing the access-opening of a journal box, said plate being formed with a marginal rib providing a rim channel designed for register with the rim of said access-opening when the cover plate is in closed position over said opening, a flat sealing gasket in the form of a loop of resilient stretchable elastomeric material removably disposed within said rim channel, a substantially flat retaining plate secured to the inside face of said cover plate and having its outer marginal regions overhanging said rim channel and extending partially thereacross coextensively therewith so as to overlie the inner marginal regions of said gasket and retain the same against outward movement away from the inside face of the cover plate, the modulus of elasticity of said sealing gasket being such that the gasket may be stretched beyond the outer confines of said retaining plate for purposes of installation of the gasket on and removal of the gasket from said cover

plate, a plurality of slots formed in said retaining plate and spaced from the margin thereof and in register with the inner side region of said rim channel, and a plurality of tongues formed on the inner peripheral edge of said gasket, one for each slot, said tongues projecting completely through said slots and serving to maintain the gasket centered within the rim channel, the material of said retaining plate immediately outwardly of each slot being offset outwardly from the plane of the plate to facilitate insertion of said tongues through their respective slots during installation of the gasket in said rim channel.

5. A journal box cover plate for closing the access-opening of a journal box, said plate being formed with a marginal flange adapted to surround the rim of said access-opening when the cover plate is in closed position over said opening, means defining a depressed inwardly extending continuous curved rib spaced from the margin of said cover plate and defining with said marginal flange a continuous rim channel designed to receive the rim of said access-opening therein when the cover plate is in its closed position, a flat sealing gasket in the form of a loop of resilient stretchable material removably disposed within said rim channel, and a substantially flat retaining plate secured to the inside face of said cover plate and having its marginal regions overhanging said rim channel and extending partially thereacross coextensively therewith so as to overlie the inner marginal regions of said gasket and retain the same within said rim channel, the modulus of elasticity of said sealing gasket being such that the gasket may be stretched beyond the outer confines of said retaining plate for purposes of installation of the gasket on and removal of the gasket from the cover plate, a plurality of slots formed in said retaining plate and spaced from the margin thereof and in register with the inner side region of the rim channel, and a plurality of tongues formed on the inner peripheral edge of said gasket, one for each slot, said tongues projecting completely through said slots and serving to maintain the gasket centered within said rim channel, the inner edge of each slot being bevelled to form a continuous extension of the surface of the curved rib which defines said rim channel to facilitate insertion of said tongues through said slots during initial installation of the gasket within the rim channel.

6. A journal box cover plate for closing the access-opening of a journal box as set forth in claim 5 wherein the material of said retaining plate immediately outwardly of each slot is offset outwardly from the plane of the retaining plate to facilitate insertion of said tongues through their respective slots during installation of the gasket within the rim channel.

7. A journal box cover plate for closing the access-opening of a journal box, said plate being formed with a marginal flange adapted to surround the rim of said access-opening when the cover plate is in closed position over said opening, means defining a depressed inwardly extending continuous curved rib spaced from the margin of said cover plate and defining with said marginal flange a continuous rim channel designed to receive the rim of said access-opening therein when the cover plate is in its closed position, a flat sealing gasket in the form of a loop of resilient stretchable material removably disposed within said rim channel, and a substantially flat retaining plate secured to the inside face of said cover plate and having its marginal regions overhanging said rim channel and extending partially thereacross coextensively therewith so as to overlie the inner marginal regions of said gasket and retain the same within said rim channel, the modulus of elasticity of said sealing gasket being such that the gasket may be stretched beyond the outer confines of said retaining plate for purposes of installation of the gasket on and removal of the gasket from the cover plate, a plurality of T-shaped slots formed in said retaining plate and spaced from the margin thereof and in register with the inner side region of the rim channel, and a plurality of T-shaped tongues formed on the inner peripheral edge of said gasket, one for each slot, said tongues projecting completely through said slots and serving to maintain the gasket centered within said rim channel, the stem portion of said tongues being slightly narrower than the entrance regions of said slots and the distal ends of the tongues being of slightly greater extent than the overall extent of said slots, the inner edge of each slot being bevelled to form a continuous extension of the surface of the curved rib which defines said rim channel to facilitate insertion of said tongues through said slots during initial installation of the gasket within the rim channel.

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