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VEHICLE DOOR LOWER EDGE AND SILL PROTECTING AND SEALING CONSTRUCTION

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Fig. 1

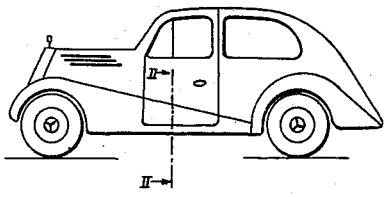


Fig. 2

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VEHICLE DOOR LOWER EDGE AND SILL PROTECTING AND SEALING CONSTRUCTION

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5 Claims. (Cl. 296—44)

My invention relates to the body of an automobile or other vehicle and, more particularly, to the door and frame structure thereof.

It is desirable that the lower margin of the door in closed condition should cover an upper zone only of the door sill whereby the lower edge of the door will have a larger road clearance than the door sill in order to keep the door when being opened from hitting the pavement of the side walk, when the automobile stops close the curb. In prior door and frame structures however, the lower zone of the outer side wall of the door sill thus left uncovered by the door was liable to be soiled and to be covered by dirt and, in its turn, to soil the clothes of the passengers as their clothes are likely to wipe over such lower zone when the passengers board or alight from the car.

It is the object of the present invention to provide a body and door structure in which the door sill although having a smaller road clearance than the door and thus having a lower outside zone left uncovered by the door, is not likely to soil the clothes of the passengers being so shaped as to keep said zone well spaced from the clothes wiping thereover.

It is another object of the present invention to provide an improved body and door structure in which an effective seal is interposed between the body and the door which seal will not interfere with a solution of the above stated problem of giving the door sill a shape precluding contact of its dirty zone with clothes of passengers boarding the car or alighting therefrom.

A further object of the present invention is to provide an effective protection from injury of the lower edge of the door which during the travel may be hit by gravel or pebbles or when the door is opened, to collide with obstacles and to seal any seam or joint that might be present at the lower edge of the door.

Further objects of my invention will appear from a detailed description of a preferred embodiment thereof which is illustrated in the accompanying drawing. The features of novelty by which the afore-stated and other objects are achieved will be pointed out in the claims. I wish it to be clearly understood however, that the description following hereinafter is intended to illustrate the invention rather than to restrict it. In the drawings—

Fig. 1 shows a passenger car of the type to which the invention is applicable and

Fig. 2 is a partial section taken along line II—II of Fig. 1 through one of the door sills and the lower portion of the associated door in closed condition.

The door sill of the body of the passenger car shown in Fig. 1 is formed by a hollow sheet metal beam composed of an inverted channel section having a web **10**, arms **11** and **12** and flanges **13** and **14** thereon, of the portion **15** of a floor panel having a depressed portion **16** extending lengthwise of its marginal portion **17** and having between the latter a raised portion **18**, of a top plate **19** and of a scuff plate **20** forming part of the bottom wall and of the side wall of the sill. The flange **13** of the

channel section is spot-welded to the raised portion **18** of the floor panel.

The flange **14** of the panel section is welded to the marginal portion **17** of the floor panel. The top-plate **19** has its inner margin welded to the web **10** of the channel section. The scuff-plate **20** has its inner margin welded to the depressed portion **16** of the floor panel.

For the purposes of the present invention the top-plate **19** projects outwardly in a substantially horizontal direction from the web **10** of the channel section and between its edges is formed with a downward step **21**. Its outer marginal zone **24** is curved downwardly and inwardly to form a longitudinal laterally projecting bulge. The outer edge of the top-plate **19** which points inwardly is welded to the upper margin of the scuff-plate **20**. Hence, it will appear that the hollow sheet metal door sill has a continuous cross sectional top wall and side wall profile composed of a substantially horizontal top line **23**, and of the downward step **21** followed by another substantially horizontal top line **24** which is extended by the downward and inward curve **22** contiguous with and forming a re-entrant angle with a downward line **20** curved inwardly to constitute the bottom profile of the sill.

The door is preferably formed by a hollow sheet metal body having an inner wall **25**, an outer wall **26** and a bottom wall **27**. The outer wall **26** is spaced from the inner wall **25** and has an inwardly curved lower marginal zone **28** extending to an edge **29**. This edge is located outwardly of and beneath the lower edge **30** of the inner wall **25**. The bottom wall **27** forms an inwardly facing channel profile contiguous with the edges **29** and **30** of the side walls **25** and **26**. When the door is closed, the channel-profiled bottom wall **27** embraces the bulge **22** of the door sill. A sealing strip **31** of sponge rubber or a suitable highly flexible and compressable plastic is fixed to the door within the channel-profiled wall **27** and, when the door is closed, is firmly pressed upon the bulge **22** all around its curved face which is thus protected from dirt. Therefore, when a passenger enters the car or alights therefrom, his or her clothes will not be soiled even should they wipe over the door sill and the bulge **22** thereof. The projecting bulge **22** will prevent the clothes from contacting the scuff plate **20**.

Another sealing strip **32** may be fixed on the lower margin of wall **25** adjacent to edge **30** so as to contact the step **21**.

In order to protect edge **29** from injury by gravel or pebbles or by collision with obstacles, when the door is opened, the sealing strip **31** is preferably formed with a longitudinal groove on its outside adjacent to its lower edge. The edge **29** projects into such groove. For that purpose the lower margin of the bottom door wall **27** may be so bent as to extend parallel to the marginal zone **28** of the side wall **26** near its lower edge and may be placed thereupon so as to form an inwardly projecting flange **33** extending into the outer groove of the sealing strip **31**.

Preferably the sealing strip **31** is shaped with a concave contact face conforming to bulge **22** and provided with a plurality of spaced recesses which may be in the form of longitudinal grooves **34** co-operating, when the door is closed, to constitute a labyrinth seal.

The scuff plate **20** may be made of any suitable material that will not be easily scratched, as is well known in the art.

While I have described my invention with reference to a preferred embodiment htereof, I wish it to be clearly understood that the invention is in no way limited to the details described and shown but is capable of numerous modifications within the scope of the appended claims.

What I claim is:

1. In a vehicle body the combination comprising a

hollow sheet metal door sill having a continuous cross-sectional top wall and side wall profile composed of a substantially horizontal top line and of a downward step followed by another substantially horizontal top line extended by a downward and inward curve continguous with and forming a re-entrant angle with a downward line curved inwardly to constitute the bottom profile of said sill, whereby the latter is formed with a longitudinal outwardly extending bulge, a hollow sheet metal door having an inner wall, an outer wall spaced therefrom and having an inwardly curved lower marginal zone extending to an edge located outwardly of and beneath the lower edge of said inner wall, and a bottom wall contiguous with said edges and forming an inwardly facing channel profile adapted, when the door is closed, to embrace said bulge, a sealing strip fixed within said channel profile and adapted to contact said bulge, and another sealing strip on the lower margin of said inner wall and adapted, when said door is closed, to contact said step.

2. In a vehicle body, the combination comprising a door sill having an outer side wall formed with a longitudinal laterally projecting bulge near its upper edge, a door having a longitudinal recess along its lower edge and adapted to embrace said bulge on substantially all sides thereof, and a sealing strip fixed to said door within said recess for engagement with said bulge, said sealing strip being shaped with a concave contact face conforming to said bulge so as to surround said bulge on substantially all sides thereof, and said contact face being provided with a plurality of spaced recesses.

3. In a vehicle body the combination comprising a hollow sheet metal door sill having a continuous cross-sectional top wall and side wall profile composed of a substantially horizontal top line and of a downward step followed by another substantially horizontal top line extended by a downward and inward curve contiguous with and forming a re-entrant angle with a downward line curved inwardly to constitute the bottom profile of said sill, whereby the latter is formed with a longitudinal outwardly extending bulge, a hollow sheet metal door having an inner wall, an outer wall spaced therefrom and having an inwardly curved lower marginal zone extending to an edge located outwardly of and beneath the lower edge of said inner wall, and a bottom wall contiguous with said edges and forming an inwardly facing channel profile adapted, when the door is closed, to embrace said bulge, and a sealing strip fixed within said channel profile and adapted to contact said bulge.

4. In a vehicle body the combination comprising a hollow sheet metal door sill having a continuous cross-sectional top wall and side wall profile composed of a substantially horizontal top line and of a downward step followed by another substantially horizontal top line extended by a downward and inward curve contiguous with and forming a re-entrant angle with a downward line curved inwardly to constitute the bottom profile of said sill, whereby the latter is formed with a longitudinal outwardly extending bulge, a hollow sheet metal door having an inner wall, an outer wall spaced therefrom and having an inwardly curved lower marginal zone extending to an edge located outwardly of and beneath the lower edge of said inner wall, and a bottom wall contiguous with said edges and forming an inwardly facing channel profile adapted, when the door is closed, to embrace said bulge.

5. In a vehicle body, the combination comprising a door sill having an outer side wall formed with a longitudinal laterally projecting bulge near its upper edge, a door having a longitudinal recess along its lower edge and adapted to embrace said bulge on substantially all sides thereof, and a sealing strip fixed to said door within said recess for engagement with said bulge, said sealing strip being shaped with a concave contact face conforming to said bulge so as to surround said bulge on substantially all sides thereof and being provided with a longitudinal groove on its outside adjacent the lower edge thereof, said door having an inwardly projecting flange extending into said groove, and said contact face being provided with a plurality of spaced recesses.

References Cited in the file of this patent

UNITED STATES PATENTS

2,114,344	Haberstump	Apr. 19, 1938
2,132,471	Hoffman	Oct. 11, 1938
2,208,723	Doty	July 23, 1940
2,211,257	Deisley et al.	Aug. 13, 1940
2,226,615	Killen	Dec. 31, 1940
2,622,286	Beck	Dec. 23, 1952

FOREIGN PATENTS

852,947	Germany	July 8, 1949