

Aug. 6, 1935.

C. A. SHOGREN

2,010,609

WATERPROOF THRESHOLD

Filed July 9, 1934

2 Sheets-Sheet 1

Fig. 1.

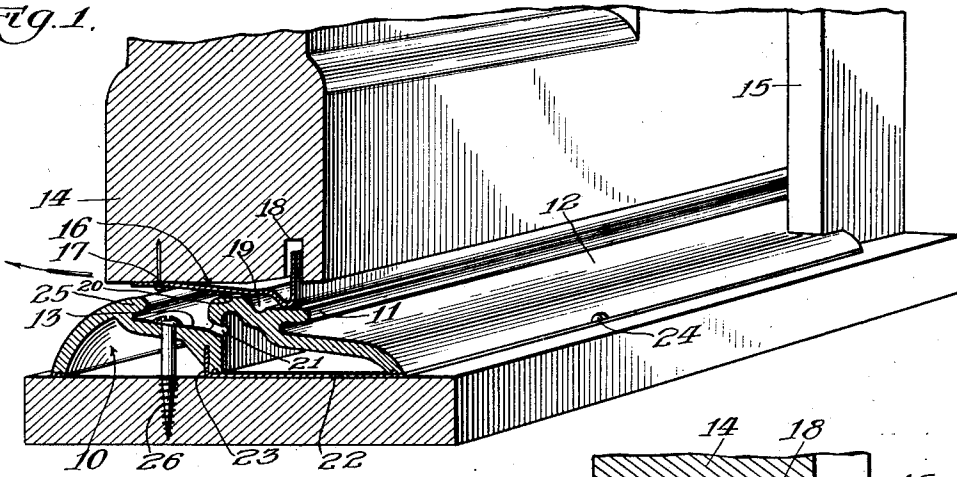


Fig. 3.

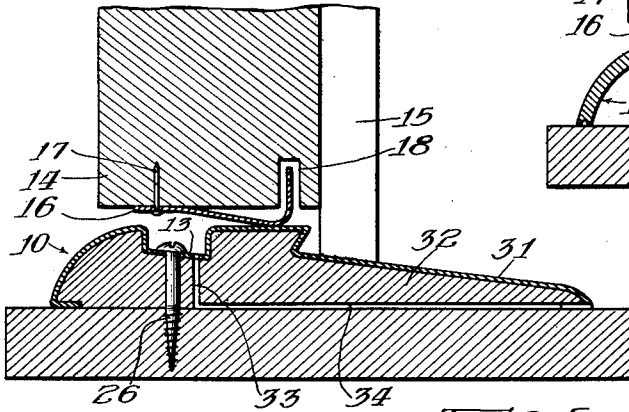


Fig. 2.

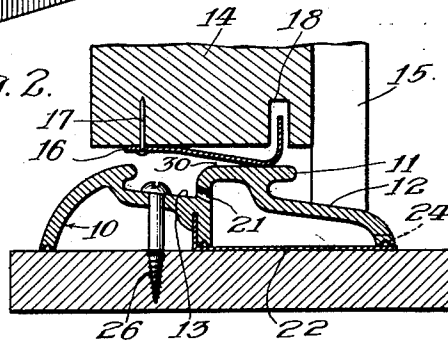


Fig. 5.

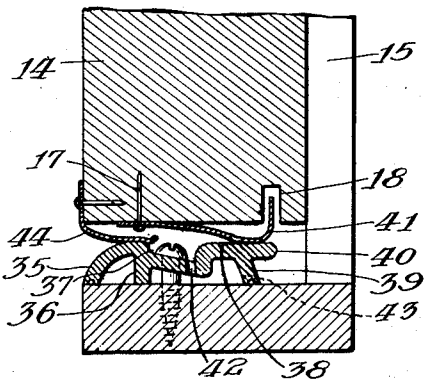
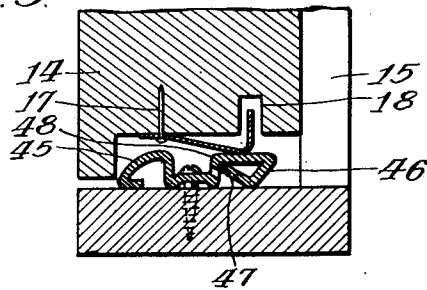


Fig. 4.



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Fig. 6.

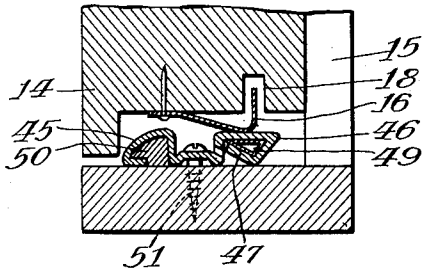


Fig. 7.

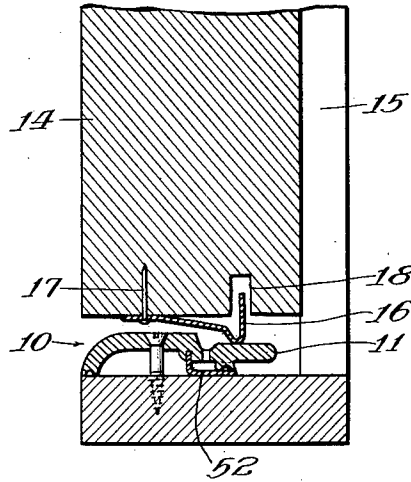


Fig. 8.

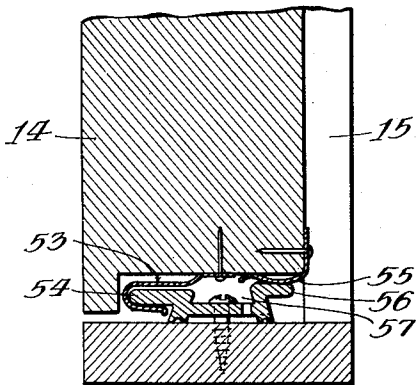


Fig. 9.

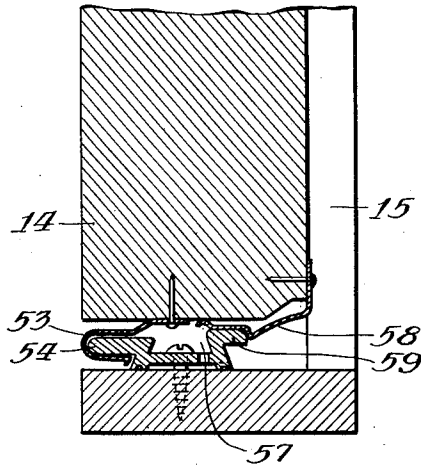
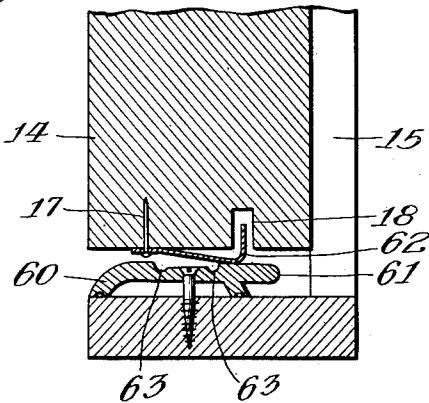


Fig. 10.



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UNITED STATES PATENT OFFICE

2,010,609

WATERPROOF THRESHOLD

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Application July 9, 1934, Serial No. 734,364

15 Claims. (Cl. 20—64)

This invention relates to improvements in waterproof thresholds and the like, particularly those made of extruded metal, such as bronze, and which are engaged by a formed strip of resilient sheet metal mounted on the bottom of the door, to minimize drafts of air under the door and to prevent water from blowing under the same during a rain storm.

In thresholds, door sills and saddles, as made heretofore, the metal structure has been provided with a tongue or flange projecting inwardly, which flange is engaged by a bent over or U shaped strip of metal or interlocking hook, mounted on the bottom of the door or other hinged member, near the inner edge thereof, to prevent drafts or air leakage. The doors, in such cases, open inwardly whereby the interlocking hook slides off from the stationary flange when the door is opened. However, such arrangements have not been successful in preventing water from blowing under the door, particularly in the case of a driving rain.

The general object of my invention is to provide an improved construction which prevents water as well as air from blowing under or leaking under the door.

A contributory object is to provide a threshold with a longitudinal groove in its upper surface to catch such water as may blow part way across the top of said threshold.

Another object is to provide drainage outlets from said groove to insure the discharge of such water as may find its way into the groove; and an additional object is to provide, on the bottom of the door, a resilient strip of metal shaped to engage the upper surface of the threshold beyond or outside of the groove, to obstruct the passage of water between the contacting surfaces and thus greatly limit the amount which reaches said groove.

In the accompanying drawings I have shown a number of different embodiments of the invention.

Fig. 1 is a perspective view of the lower portion of a door, the threshold beneath it, and the spring metal strip which provides the seal;

Figs. 2, 3, 4, 5, 6, 7, 8, 9, and 10 are sectional elevations of various different forms of the invention.

The construction shown in Fig. 1 has certain advantages from a manufacturing and commercial standpoint and may be considered the preferred form. The threshold 10 is made by an extruding process, as heretofore, and has the cross sectional form shown, with an outwardly projecting ledge or flange 11 which serves to stop water

that has blown up along the inclined surface 12. There is also a groove or recess 13 in the top of the threshold comprising an important part of the invention in that it catches any water that may be blown over the top of the flange.

The door 14 which swings inwardly away from the stop 15, has a strip of spring metal or resilient bronze 16 nailed to the bottom of it at 17 and shaped like a hook, in section, with the hooked end projecting upwardly into a recess 18, to form a barrier. When the door is shut, the rounded edge of the spring metal rides over the several high parts of the threshold but comes to rest in contact with the flange 11, leaving no appreciable crack and thus forming a seal, which prevents water from blowing through freely. If water should leak through, being driven by a strong draft, it would be retarded in the groove 19, and if it continued to blow over the high point 20 of the threshold, it would collect in the groove 13, the bottom of which is preferably inclined, and would drain through the hole 21 into the hollow space closed by the sheet metal base 22. This sheet metal is bent up at one end 23 to fit in a suitable slot, forming an inexpensive way to hold it in place. Thus when the threshold is moved back and forth a little, in positioning it initially and before securing it in place, this sheet metal base or plate moves with the threshold and facilitates the work of installing it. The collected moisture escapes through the opening 24 on the outside of the threshold. There are a series of openings 24 corresponding to the series of openings 21, but the two rows are preferably staggered and usually three or four of each holes are enough for the ordinary threshold, or even less. On the inside, the upper surface of the threshold rises in a smooth curve that terminates in a flange on hook 25 which is directed outwardly, not inwardly, and which acts as a further barrier to prevent water from blowing into the room.

The threshold is held down by a series of screws 26 which pass through the wall constituting the bottom of the trough 13, resulting in a partial concealment of the screw heads, and presenting a more pleasing appearance than where the screws pass through one of the upper surfaces as heretofore.

Fig. 2 shows a modified form in which the features are substantially the same as in Fig. 1, and are indicated by the same references, except that the smaller upper groove 19 is omitted, and the spring metal seal 16 slides over the flat top surface 30 of the threshold, which latter is not made in stepped form at two different levels.

In Fig. 3, the threshold is nearly the same in cross sectional outline as Fig. 2, but is made of sheet metal 31 instead of extruded metal and in order to make it more solid, it contains a filler 32 which may be a strip of wood, cut to shape, or which may be of any suitable composition, with the metal formed over it. A hole 33 is formed in the filler which joins a horizontal duct 34 through which the water drains to the outside of the threshold.

An important feature in each of the three forms of the invention described, is the location of the groove or trough on the inside of the flat surface over which the resilient metal slides and with which it forms a seal. This resilient metal not only cuts off drafts but prevents water from blowing through except in very extreme cases of a hard driving rain, and in such cases the water collects in the trough and is not blown into the room to damage the floor.

Fig. 4 shows another modification in which the threshold 35 is of extruded brass or other suitable non-corrosive metal or alloy. It has a vertical supporting leg 36 joining the bottom of the trough 37 and has a flat top 38 supported by a vertical flange 39. The outer part of the flat tread projects beyond its support to form a projecting ledge 40 which serves to prevent most of the water from reaching the resilient strip 41, very much as in the other forms described. The moisture which collects in the trough drains downwardly through the opening 42 and drains outwardly through a series of openings 43. An auxiliary inner seal in the form of a resilient strip 44, may also be provided.

Fig. 5 shows a somewhat similar threshold 45 formed of sheet metal. The support, instead of being a rib, is formed by bending the metal around into a hollow triangular structure 46. The inner edge of the sheet metal at 47 is pressed against the bend 48 by any weight applied to the top of the triangular section, thus forming a very rigid support.

In Fig. 6 the construction is substantially the same, except that the hollow triangular space is provided with a filler which may be a sheet metal filler 49 in the form of a triangle or a solid triangular bar. If desired, a filler 50 may be inserted also in the rear hollow part of the threshold. It may be of wood, sponge rubber or other material. If moisture should work its way rearwardly past the fastening screw 51, it would be stopped by the filler, particularly if the same were absorbent.

In Fig. 7, the threshold is provided with a strip of sheet metal 52, or angle iron, which provides a bottom for the enclosure into which the moisture drains.

In Fig. 8, as an additional feature, a resilient strip 53 is formed as a hook to embrace the inwardly projecting ledge 54. The outer strip 55 is secured to the outer side of the door instead of to the bottom, and presses against the flat top portion of the outwardly projecting flange 56. The trough or groove 57 occupies a central position.

The structure of Fig. 9 is generally similar to Fig. 8 except that the resilient sheet metal 58 is bent downwardly to form a resilient bead which rides over the upper surface of the flange 59 and then snaps down to form an air and water seal in contact with the beveled outer end of the said flange.

Fig. 10 is a structure in which the threshold 60 has a ledge 61 projecting outwardly there-

from, the upper surface of which is engaged by the resilient sheet metal seal 62 in a manner similar to what has already been described. The trough may be shallow and bounded by two shallow grooves 63, or said trough may be omitted, and the shallow grooves relied on, in conjunction with a resilient seal of more than the usual stiffness or spring pressure.

It will be noted that the inner side of the threshold is inclined upwardly to the tread, thereby providing a bevel which insures that the resilient sealing member will ride up and over the highest part of the threshold at this point and will slide over the groove to engage the surface of the tread beyond the same.

Many of the features described herein are adapted for use on a casement window or other closure, as will be apparent, and, therefore, the term "door" appearing in some of the claims is used as descriptive of a movable or hinged closure in general, and is intended to include such equivalent structures as the prior art permits.

I claim:

1. The combination with a metal threshold, having a trough in its upper surface, the outer margin of said upper surface being substantially no higher than the inner margin thereof, the walls of said trough being formed integrally with said threshold and one of said walls having drainage openings therein near the bottom, of a door above said threshold hinged to swing inwardly, and a metal strip secured to said door and yieldingly engaging said upper surface to ride over said trough and engage said outer margin to form a seal between said trough and the outer extremity of said threshold, any water which leaks through said seal being caught by said trough and discharged.

2. The combination with a threshold, having a trough in its upper surface, of a door above said threshold hinged to swing inwardly, a metal strip secured to said door and yieldingly engaging said upper surface between said trough and the outer part of said threshold to form a seal, and a flange extending outwardly from said threshold.

3. The combination with a threshold, having a trough in its upper surface, of a door above said threshold hinged to swing inwardly, a metal strip secured to said door and yieldingly engaging said upper surface between said trough and the outer part of said threshold to form a seal, a flange extending outwardly from said threshold, the upper surface of said flange being lower than the upper surface of said threshold adjacent the outer side of said trough, and a groove between said two upper surfaces, whereby the passage of water between said door and said threshold is obstructed at four places.

4. The combination with a threshold having an outwardly projecting ledge, an outer surface sloping up to the under surface of said ledge, said threshold having a trough in its upper surface and a door above said threshold having a resilient metal strip secured thereto to yieldingly engage said upper surface between said trough and ledge.

5. The combination with a threshold, of a door hinged above the same and having a slot in the bottom thereof near the outer surface of said door and a resilient angle member secured to the bottom of said door by one flange, with the other flange received within said slot, said angle member yieldingly engaging the upper surface of said threshold to form a seal and prevent the substantial accumulation of water between said door and

said threshold, said threshold having a trough in the upper surface thereof between said seal and the inner side of said threshold to catch such small quantities of water as are forced past said seal.

6. The combination with a threshold having its upper portion depressed to form a trough with two elevated surfaces on each side of said trough, of a hinged door above said threshold having a pair of resilient members secured thereto, each of said members yieldingly engaging one of said elevated surfaces.

7. The combination with a threshold having its upper portion depressed to form a trough with two elevated surfaces on each side of said trough, of a flange projecting inwardly from the upper part of said trough, a hinged door above said threshold having a plurality of resilient members secured thereto, one of said members yieldingly engaging the outer one of said elevated surfaces and another of said members being bent around to embrace said flange.

8. A metal threshold having a section consisting of an elevated tread, an inclined inner side and an inclined outer side, a horizontal ledge at the top of said outer inclined side to prevent water from blowing up the same and over the top and a trough in the upper surface of said threshold to catch such water as may reach the same, one of the side walls of said trough extending downwardly to form an intermediate support.

9. A metal threshold comprising an upper span or tread, an intermediate upright support therefor and an inclined inner and outer support, said tread being formed with a trough therein having an inclined bottom joining said intermediate support, and a ledge overhanging said outer support to prevent water from flowing freely up the inclined surface thereof and over the top.

10. A metal threshold comprising an upper tread, an intermediate vertical support, an outer sloping side forming a hollow structure, an outwardly projecting ledge at the upper end of said sloping side and a sheet metal member closing the bottom of said hollow structure.

11. A metal threshold comprising an upper tread, inclined inner and outer side walls and an intermediate vertical support, a trough one side wall of which is comprised of the upper part of said support and drainage openings in the latter, the bottom of said trough having openings therein for fastening screws whereby the heads of the

latter are located below the surface of the tread in an inconspicuous position.

12. A metal threshold comprising an upper portion depressed to form a longitudinal trough therein, the outer part of said upper portion having a triangular supporting base with the apex of the triangle at the bottom.

13. The combination with a threshold having a tread and a plurality of supporting members therefor, said tread having a trough therein, and one of said supporting members having a slot therein, a sheet metal floor piece having a margin arranged at an angle therewith and received within said slot whereby said floor piece may be moved with said threshold when the latter is being installed, one of the walls of said trough having drainage openings therethrough near the bottom, of a door above said threshold hinged to swing inwardly, and a metal strip secured to said door and yieldingly engaging said tread between said trough and the outer part of said threshold to form a seal, whereby water which may leak through said seal is caught by said trough and discharged over said floor plate.

14. The combination with a metal threshold having a trough in its upper surface, the walls of said trough being formed integrally with said threshold and one of said walls having drainage openings therein near the bottom, the juncture of the top of the outer wall of said trough with the adjacent portion of said upper surface being free from overhanging ribs or obstructions, of a door above said threshold hinged to swing inwardly, and a resilient strip secured to the bottom of said door substantially concealed from view, the forward edge of said strip being turned upwardly to ride over the upper surface of said threshold and over and beyond the trough therein, engaging and forming a seal with the outer part of said upper surface, whereby no water blown inwardly from the outside reaches said trough except what may leak through said seal.

15. In combination, a metal threshold comprising an upper portion depressed to form a longitudinal trough, the parts of said upper portion on opposite sides of said trough forming a divided tread, one of said tread parts being triangular in section with the apex of the triangle at the bottom, forming a support, and a door having a resilient member carried thereby and engaging said triangular part to form a seal.

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