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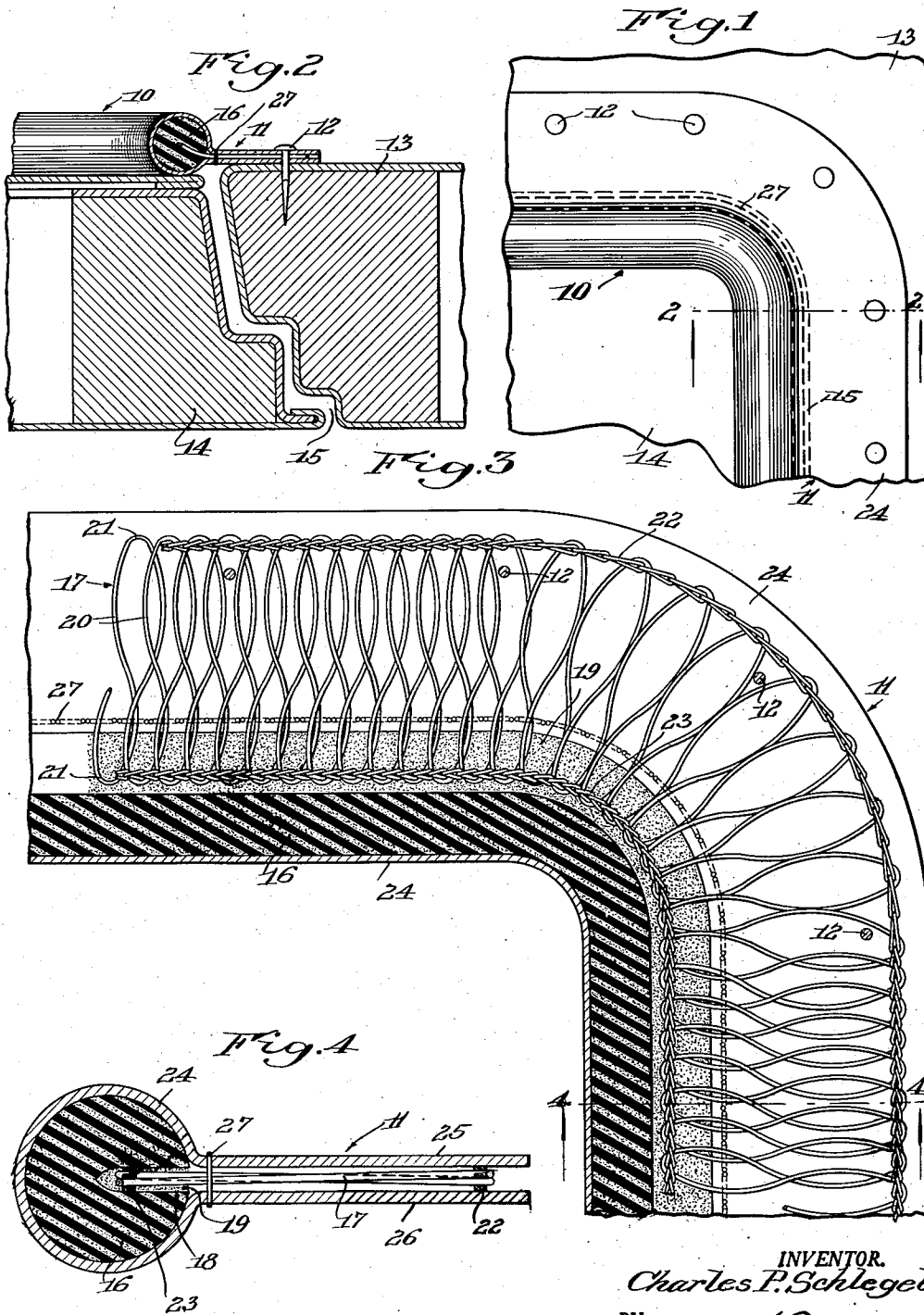
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2,574,124

WEATHER STRIP

Filed June 20, 1947

2 SHEETS—SHEET 1



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2 SHEETS--SHEET 2

Fig. 5

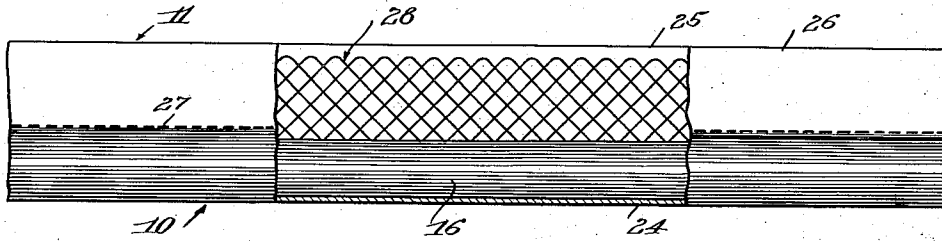


Fig. 6

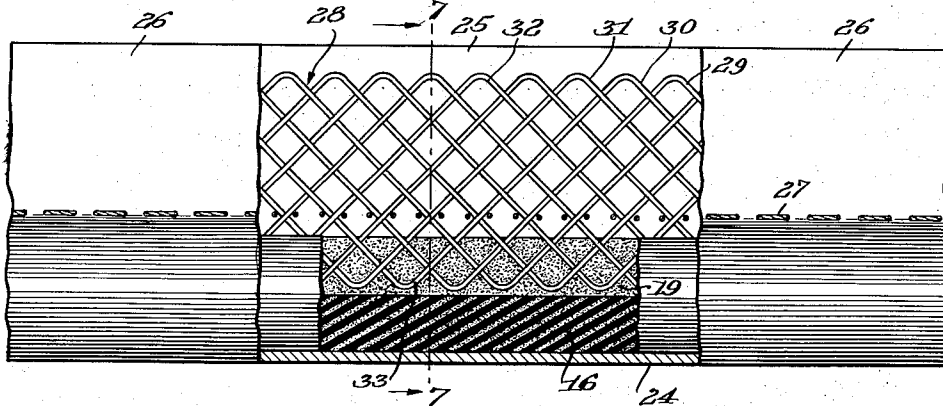
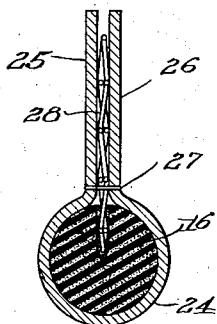


Fig. 7



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WEATHER STRIP

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5 Claims. (Cl. 20-69)

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This invention relates to weather strips and, more particularly, to the flexible "windlace" variety, such as adapted for attachment, for example, to the frame of a vehicle door about the outline of an opening therein in position for contact with the door to seal its joint with the frame, one object of the invention being to provide an improved windlace of this character having a more simple, practical and inexpensive type of construction.

Another object is the provision of a windlace of the above character having an attaching strip provided with a stiffening strip or braid of a more simple, flexible and efficient nature, so that the windlace may be more readily and smoothly curved in the plane of its attaching strip to follow the outlines of an opening to be sealed, while resiliently stiffened for engagement with the door in its closed position. More specifically stated, it is an object of the invention to supply such a windlace with a stiffening strip or braid composed of transversely extending strands of resiliently flexible metal wire so arranged and connected with one another as to make such stiffening strip more readily flexible in its own plane to follow the outline of an opening, without necessity for radially slitting its outer edge at the points of curvature to permit such bending.

A further object is to provide a windlace having the above advantages in a form of construction adapted to be more readily and economically manufactured and assembled ready for use.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a fragmentary side elevation of a windlace embodying the present invention and showing the same as applied in use to the frame of a door;

Fig. 2 is a sectional view on the line 2-2 in Fig. 1;

Fig. 3 is an enlarged central sectional view in the plane of the attaching strip of the windlace, showing the same applied in use as in Fig. 1;

Fig. 4 is a section on the line 4-4 in Fig. 3;

Fig. 5 is a plan view, partly broken away, showing the windlace in a somewhat modified form;

Fig. 6 is an enlarged view of the parts shown in Fig. 5 but partly in section to better illustrate the construction, and

Fig. 7 is a sectional view on the line 7-7 in Fig. 6.

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The preferred embodiment of the invention, herein disclosed by way of illustration, comprises a bead-like core portion indicated generally at 10 having a laterally extending, flat, attaching strip portion 11 adapted to be secured, as by tacks 12, to the frame 13 of a door 14, for sealing the joint 15 between the door and its frame.

The core 10 of the windlace is composed principally of a bead-like filler strip 16, of resiliently soft and flexible material such, for example, as sponge rubber, preferably of cylindrical shape and adapted to be pressed into close sealing contact with the surface of the door. The attaching strip 11 for this core encloses a stiffening strip 17 of transversely extending, resiliently flexible wire strands, as more particularly described hereafter. One edge of this stiffening strip 17 is embedded in and secured to the core, as by molding the rubber core about the edge of the strip, as well understood in the art, or by slitting the core radially inwardly, as at 18, and inserting and securing the stiffening strip 17 therein with rubber or other suitable cement, as shown.

The stiffening strip 17 is preferably constructed from a length of resiliently flexible metal wire bent alternately in opposite directions as at 21, to provide oppositely disposed loops forming the opposite edges of the strip, as shown. The transversely extending wire strands thus produced are laid in relatively close proximity to one another in the unstretched portions of the windlace and the loops are connected along the opposite edges of the strip and retained in orderly arrangement, preferably by means of ligatures such as strands or stay cords 22 and 23 of suitable material knitted through the ends of the loops at the opposite edges, respectively. The cord 22 at the outer edge of the strip may be made of cotton or other fibrous or suitable material and knitted somewhat loosely between and through the wire loops at the edge of the strip, so as to be capable of some extension and allow some separation of adjacent loops, when the windlace is curved about a corner of a window opening, as shown in Fig. 3. I have found that this outer strand 22 may be made advantageously of an elastic rubber cord, knitted between and through the loops, and adapted to stretch between adjacent loops as shown in Fig. 3, to facilitate such curvature of the windlace about the portions of an opening. Where the stiffening strip is molded in the filler strip 16 and thus subjected to heat, the cord 23 is made of a fiber yarn, or of a plastic such as nylon, capable of withstanding such heat without injury. In any case, it has been found pref-

erable for this cord to employ a non-stretching yarn and to knit it tightly through the wire loops to resist longitudinal stretching of the filler strip 16. Such connection of the loops of the wire strands is quickly and economically accomplished by knitting the stay cord through them, as described, thereby sufficiently binding the wire strands together to retain the shape of the strip during the handling thereof before, as well as after assembly in the windlace.

After the stiffening strip 17 has been secured in the bead-like filler strip 16 of the core, a strip of flexible covering material 24, of textile fabric or the like, is wrapped around the core 16 with its edge portions 25 and 26 extended to enclose and cover the opposite sides of the stiffening strip 17 and secured to each other by a line of stitching 27 passed through the edge portions 25 and 26, preferably closely adjacent to the core, as shown. The cover portions 25 and 26 and the stiffening strip 17 thus together form the attaching strip 11 through which tacks may be driven to securely attach the windlace to the door frame, as 13. The windlace is readily carried around the outline of an opening and smoothly curved about the corners thereof, in the plane of the attaching strip without causing it to appreciably buckle or pucker out of such plane. As so attached, the core 10 projects at one side across the plane of the frame surface to which it is tacked, so as to lie in the path of and engage the door when in closed position. In such position, the door presses the core slightly to one side against the tension of the spring wire strands of the stiffening strip 17 and thus maintains close contact of the core with the door surface to effectively seal the joint. This yielding of the core is afforded in part also by the resilient yielding of its own material which, together with the stiffening strip, spring back to normal position when released by the door.

The stiffening strip may also be formed as a woven wire braid, as shown in Figs. 5, 6 and 7. In this modified construction, the core portion 10 and attaching strip 11 have the same construction as described above and the stiffening strip 28 is associated therewith in the same manner. In this braid-like stiffening strip, however, a series of resiliently flexible metal wires, as 29, 30 and 31, are arranged to extend obliquely across the strip in interwoven relation with each other as shown, the wires being alternately bent in opposite directions as 32 and 33, to provide oppositely disposed loops forming the opposite edges of the braid. The braid is enclosed between the edge portions 25 and 26 of the cover strip which are stitched together as before by a line of stitching 27 adjacent to the core. The wire strands of which the braid 28 is formed are adapted to resiliently bend and slide one upon another to a sufficient extent in the plane of the braid, so as to allow it to be readily and smoothly curved in such plane as described above in connection with the modification of Figs. 1 to 4, inclusive, without appreciable buckling or puckering of the attaching strip or windlace.

A windlace of either of the above forms is readily manufactured with a minimum requirement of materials of inexpensive nature and may be quickly and easily tacked in place around an opening or joint to be sealed. The core and its attaching strip are yieldable for curvature, both in the plane of the attaching strip and transversely thereto for adaptation to practically any opening and for maintaining close contact with

the surface of the door in its closed position. The covering material 24 is made of fabric selected to attractively adapt the windlace to its surroundings, and the windlace maintains its smooth and neat appearance in both the curved and straight portions thereof.

It will thus be seen that the invention accomplishes its objects and while it has been herein disclosed by reference to the details of preferred embodiments, it is to be understood that such disclosure is intended in an illustrative, rather than a limiting sense, as it is contemplated that various modifications in the construction and arrangement of the parts will readily occur to those skilled in the art, within the spirit of the invention and the scope of the appended claims.

I claim:

1. A windlace having a bead-like core of resiliently soft and flexible material, a resiliently flexible stiffening strip having one edge embedded in and secured to said core, said strip comprising a series of relatively movable strands of resiliently flexible metal wire extending transversely of said strip, a strand of longitudinally yieldable, non-metallic material knitted through and connecting adjacent wire strands along the outer edge of said strip, and a strip of flexible covering material wrapped around said core with its edge portions secured together and extended to cover the opposite sides of said stiffening strip to form therewith an attaching strip flexible in its own plane and adapted to be attached to a structural member about an opening therein to resiliently support said covered core in sealing relation to said opening.

2. A windlace having a bead-like core of resiliently soft and flexible material, a resiliently flexible stiffening strip having one edge embedded in and secured to said core, said strip comprising a series of strands of resiliently flexible metal wire extending transversely of said strip and bent at their opposite ends to form loops connecting adjacent strands along the opposite edges of said strip, and a strand of flexible material knitted through and connecting adjacent loops along each of said strip edges, and a strip of flexible covering material wrapped around said core with its edge portions secured together and extended to cover the opposite sides of said stiffening strip to form therewith an attaching strip flexible in its own plane and adapted to be attached to a structural member about an opening therein to resiliently support said covered core in sealing relation to said opening.

3. A windlace having a bead-like core of resiliently soft and flexible material, a resiliently flexible stiffening strip having one edge embedded in and secured to said core, said strip comprising a series of strands of resiliently flexible metal wire extending transversely of said strip and bent at their opposite ends to form loops connecting adjacent strands along the opposite edges of said strip, and a resilient rubber strand knitted through and connecting adjacent loops along each of said strip edges, and a strip of flexible covering material wrapped around said core with its edge portions secured together and extended to cover the opposite sides of said stiffening strip to form therewith an attaching strip flexible in its own plane and adapted to be attached to a structural member about an opening therein to resiliently support said covered core in sealing relation to said opening.

4. A windlace having a bead-like core of resiliently soft and flexible material, a resiliently

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flexible stiffening strip having one edge embedded in and secured to said core, said strip comprising a resiliently flexible metal wire bent upon itself alternately in oppositely disposed loops forming the opposite edges of said strip and a series of transversely extending strands, and a strand of flexible material knitted through and connecting adjacent loops along each of said strip edges, and a strip of flexible covering material wrapped around said core with its edge portions secured together and extended to cover the opposite sides of said stiffening strip to form therewith an attaching strip flexible in its own plane and adapted to be attached to a structural member about an opening therein to resiliently support said covered core in sealing relation to said opening.

5. A windlace having a bead-like core of resiliently soft and flexible material, a resiliently flexible stiffening strip having one edge embedded in and secured to said core, said strip comprising a resiliently flexible metal wire bent upon itself alternately in oppositely disposed loops forming the opposite edges of said strip and a series of transversely extending strands, and a resilient rubber strand knitted through and con-

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necting adjacent loops along each of said strip edges, and a strip of flexible covering material wrapped around said core with its edge portions secured together and extended to cover the opposite sides of said stiffening strip to form therewith an attaching strip flexible in its own plane and adapted to be attached to a structural member about an opening therein to resiliently support said covered core in sealing relation to said opening.

CHARLES P. SCHLEGEL.

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