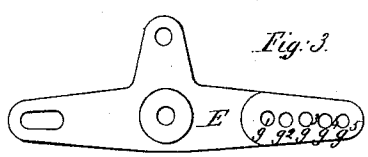
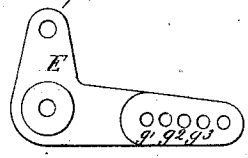
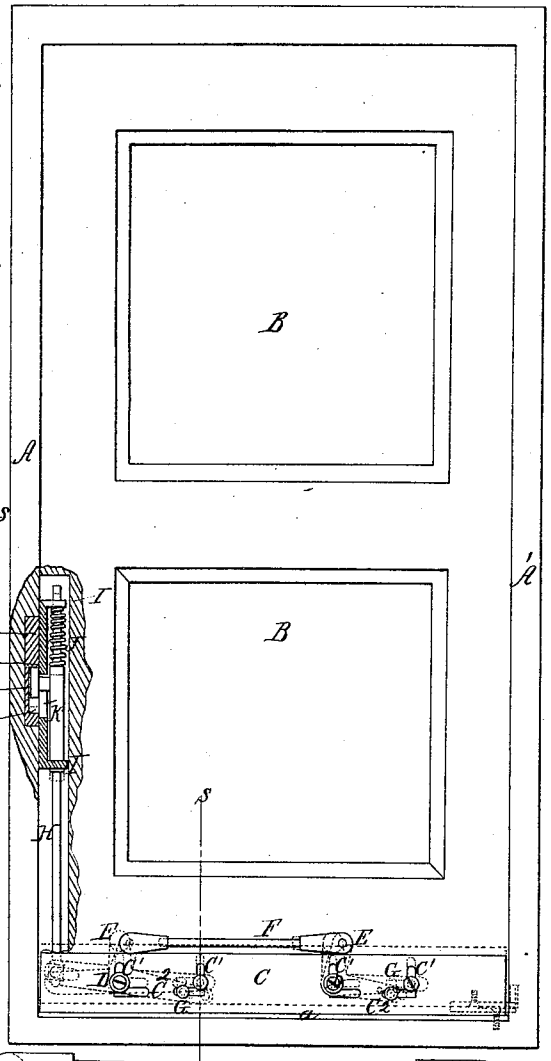
B. F. Averill.

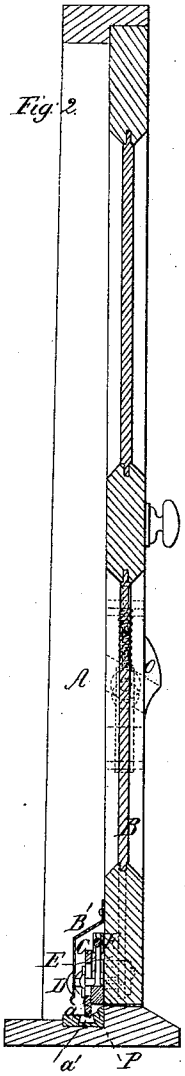
Weather Strip.

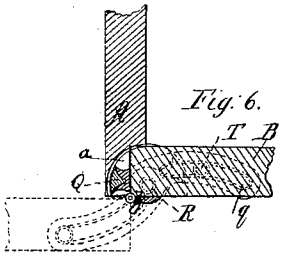
No. 38,802. Patented Jun. 9, 1863.

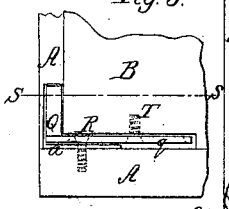


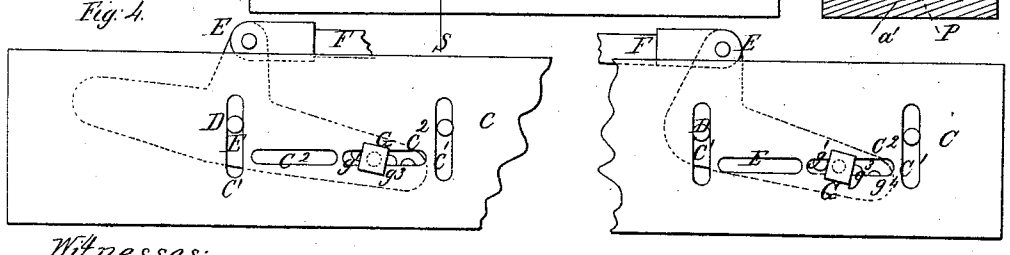












Witnesses;

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UNITED STATES PATENT OFFICE.

BENJAMIN F. AVERILL, OF DUNKIRK, NEW YORK.

IMPROVEMENT IN WEATHER-STRIPS.

Specification forming part of Letters Patent No. **38,802**, dated June 9, 1863.

To all whom it may concern:

Be it known that I, BENJAMIN F. AVERILL, of Dunkirk, in the the county of Chautauqua and State of New York, have invented a certain new and useful Improvement in the Means of Operating Weather-Strips for Doors; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, which form a part of this specification, in which—

Figure 1 represents on a small scale a side view of my weather-strip and connections affixed to a door and door-frame. Fig. 2 is a cross-section on the line S S in Fig. 1, seen from the right-hand side. Portions of the door and door-frame are represented as broken away in order the better to represent the mechanism. Fig. 2^a represents a portion which is out of the plane of section. The position of the parts when the strip is forced down so as to be of effect is shown in dark lines. The position of the parts when the strip is elevated out of the way is shown in red outlines. Fig. 3 shows on a larger scale some of the mechanism which gives motion to the weather-strip, and Fig. 4 shows on the same enlarged scale the weather-strip itself. Fig. 5 represents a portion of the door-frame and mechanism, as seen from the rear or opposite side to that shown in Fig. 1 Fig. 6 is a horizontal section in the line S S in Fig. 5. The red lines in Fig. 6 show the position of the parts when the door is open. The black lines show the position when the door is closed.

Similar letters of reference indicate like parts in all the figures.

My invention is intended more particularly for railroad-coaches and other important structures when used in very cold climates. It is adapted to cut through any snow or ice which may adhere to or form on the door-sill without twisting or severely straining the door, and to prevent snow or ice from straining the hinges and preventing the proper action of the other mechanism.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation by the aid of the drawings and letters of reference denoted thereon.

A is the door-post, *a* is the door-sill, and B the door, the latter being hung on hinges affixed to the opposite door-post, A′. A strip of rubber, *a′*, is let into the sill and secured by dovetailing.

B′ (see Fig. 2) is a protecting plate or shield, of cast-iron or other suitable material, between which and the body of the door the weather-strip C is allowed to slide. The protection or casing B′ is shown only in Fig. 2. In Fig. 1 this plate is supposed to have been removed. I prefer to make this strip C of steel, with the lower edge sharpened, in order the better to overcome the resistance occasionally offered by dirt, snow, &c., which may be interposed between the lower edge of the door B and the rubber *a′*. Four vertical slots, C′, are provided in the plate C, through two of which pass the bolts D D, which serve as centers or fulcra for the levers E E, each formed as represented. The bolts D D and the additional bolts represented serve to steady or guide the weather-strip C as it slides up and down.

F is a connection between the vertical arms of the levers E, and compels the two to correspond in position each with the other. G G are pins fixed in horizontal arms of the levers E, there being several holes, g g' g^2 g^3, in these arms to either of which the pins G may be transferred at pleasure so as to vary their distance from their respective centers D D, and consequently to vary the amount of motion they will receive from any given motion of the levers E E.

C^2 C^2 are horizontal slots in the strip or plate C, adapted to receive the pins G G, and thereby compel the plate or strip C to move up and down therewith. They are of sufficient length to allow the shifting of the pins G G in the several holes in E, as described. The slots C^2 C^2 are but little wider than the diameter of the pins G G. By shifting both the pins G G farther out in their respective levers E, the strip C will ascend higher and descend lower than before, and by shifting only one of these pins G a corresponding change will be made in the motion of that end of the strip alone. The changeable pins G G, therefore, as arranged, allow me to adapt my mechanism to all conditions, and to move the entire strip uniformly or one end more than the other, as may be required in any situation.

H is a vertical rod connected to a horizontal

arm of one of the levers E and running up through guides I I.

J is a spiral spring, which tends to depress the rod H, and thus to elevate the plate or strip C, through the agency of the levers E and their connections.

K is a stud or pin, extending horizontally outward from the rod H, a little beyond the edge of the door B, and L is a wheel mounted thereon so that it is free to turn.

M N are two inclined planes cast on a single plate or foundation, O, and screwed or otherwise secured on the door-post A in the position represented. The faces of the planes M N are presented toward each other, and their distance apart is a little greater than the diameter of the wheel L.

P (see Fig. 2) is an inclined face on a plate of metal, formed and located as represented, and which aids in elevating the strip C in case of any failure or insufficiency of the other portions of the apparatus. It is especially useful when, by reason of a very quick opening of the door, the resistance due to the inertia of the slide C is very considerable.

The door-frame A is hollowed out near the base on the hinged side, and the cavity is lined with a slight metal casing, *a*, as represented in Figs. 5 and 6.

Q is a scraper of the form represented, hung on the door-sill by the screw R, as represented, which serves as a pivot for its motion. A slot, *q*, in the thin horizontal arm of scraper Q, receives a screw, T, which is fixed in the under side of the door B, and moves with it. The center of motion R of the scraper Q not being coincident in position with the line of the hinges *b*, the scraper is turned around within the casing *a* at each movement of the door, and by its form completely removes all snow which may be there. In the absence of this provision for clearing the space between the door and the frame at this point, snow, by successively falling in and being compressed, is liable to accumulate there in a dense and thick mass, and to throw the door so far out of its proper position that, in addition to greatly straining its hinges, it would disturb the relation of the parts above described, and by holding the other side of the door too high prevent the proper rising of the slide C.

The operation of my invention will now be readily understood. As soon as the door B is nearly shut, the wheel L enters the space between the inclined planes M N, and commences to rise by rolling upon the lowermost plane, M. This movement elevates the rod H, turns both the levers E E, and depresses both the pins G G, and consequently the entire weather-strip C, forcing the lower edge of the latter tightly down upon the rubber *a'* when the door B is tightly shut and latched. So long as the parts remain in these positions the weather-strip C fulfills its function of excluding the wind and rain from the interior of the building, railroad-car, or other structure on which the door B is made to serve, but the moment the door B is again opened (by turning again on its hinges in the opposite direction in the ordinary manner) the wheel L acts on the uppermost plane, N, and is depressed, thereby elevating the weather-strip C to its original position. The spring J holds the parts in this latter position until the door is again closed, and the inclined plane P and the escapes Q serve to increase the certainty of the successful operation of the other parts, the first by helping to lift the strips C, when, by reason of the resistance due to inertia or other cause, it is reluctant to act with sufficient promptness, and the second by reducing the main cause tending to seriously disturb the proper relation of the parts M, N, and K.

Weather-strips have been before proposed adapted to slide vertically upon or within the door, but I am not aware that any such were both elevated and depressed by a positive motion so as to operate in the manner and realize the advantages of my invention.

All weather-strips are liable to stick, and sometimes to be frozen fast, and when springs or the like are relied on to elevate the strip they are liable to fail unless their force is very great, and in the latter case the additional resistance thereby opposed to the descent of the strip is very serious.

In my invention the inclined plane M compels the descent, and the inclined plane N compels the ascent, of the strip, and the spring J needs to be only sufficient to overcome the gravity of the parts, so as to sustain them after they have been elevated by other means.

It will be observed that in my invention the motion of the strip is begun and ended while the door is very near its closed position, and that the principal force—to wit, that due to the plane M—acts upward or tends to elevate the door B. This counteracts the tendency of the door to sag, and the entire apparatus will remain in order for a long period. The resistance it opposes to the closing of the door is at about the center of the height of the door and near the handle, so that whether the door finishes its motion by momentum or by a smart pull on the knob, no twisting strain is thrown upon it. The bearing of the wheel L may be oiled occasionally, as also may the centers D D and pins G G, if it be found necessary. The inclines M and N need not be straight. They may be curved to any extent so long as they are kept parallel or nearly parallel, so that they may act in the manner and with the effect explained.

I prefer to provide my strips C with additional slots, so as to allow them to serve on either right-hand or left-hand doors, indiscriminately, and have so represented this part in the drawings, but this is not essential.

Having thus fully described my invention, what I claim as my improvement in weather-strip mechanism, and desire to secure by Letters Patent, is as follows:

1. The two inclined faces M N, so arranged on the door-frame as to operate the weather-

strip C through the aid of the piece K and connecting parts, substantially in the manner herein set forth.

2. The arrangement of the separately adjustable pins G G in the holes g g', &c., in the connected levers E and the slots C^2 C^2, in the sliding weather-strip C, or its equivalent, so as to vary the range of motion of the weather-strip C at either end or both ends, substantially in the manner and for the purpose herein shown.

3. The employment of the inclined metallic surface P on the door-sill, in combination with a sliding weather-strip, C, on the door, and with supporting means adapted to act rapidly at the moment of the closing of the door and opening of the same, substantially as represented by M, N, K, and E E, for the purpose herein explained.

4. The scraper Q q, pivot R, and moving pin T, arranged as represented relatively to each other, and to the door-frame A, door B, and the working parts of the weather-strip mechanism, substantially as and for the purpose represented.

B. F. AVERILL.

Witnesses:
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