This invention relates to railway freight cars and is primarily concerned with an improved weatherstrip arrangement for a railway box car side door.

The primary object of the invention is to provide an improved weatherstripping arrangement for a door on a railway box car.

The principal object of the invention is to provide in a railway freight car including a wall having a door opening and a door mounted on the wall, a spark strip secured to the wall at the rear edge of the door opening and having a flange spaced from the wall and a reversely flanged resilient element secured to the wall at the rear edge of the door opening, a resilient weatherstrip element having an arm disposed between the wall and the door, a flange of the rear door post securing the resilient element, compressing the element in a direction transversely of the car and toward the side wall, when the door is closed.

Another object of the invention is to provide in a railway freight car including a wall having a door opening and a door mounted on the wall for slidable movement longitudinally of the car and over the door opening, a spark strip having a cross section in the shape of a channel having one flange secured to the wall at the rear edge of the door opening and a S-shaped resilient metal element positioned in the channel having one arm secured to the wall and a rear edge member on the door having a flange spaced from the door adapted to project between and contact the other flange of the channel and the other arm of the resilient element, compressing the element in a direction transversely of the car and toward the wall to form a weatherseal when the door is closed.

An important object of the invention is to provide in a railway box car including a side wall having outside sheathing and a door opening with a door post secured to the wall at the rear edge of the door opening and a spark strip having a flange positioned between the door post and the sheathing and secured to the wall, a resilient weatherstrip element having an arm disposed between the door post and the sheathing and secured to the wall.

The foregoing and other objects of the invention are attained by the construction and arrangement illustrated in the accompanying drawings wherein:

Fig. 1 is a side elevational view of the portion of a side wall of a railway box car at the door opening showing the door mounted on the side wall;

Fig. 2 is a broken horizontal sectional view taken on the line 2—2 of Fig. 1 showing the door in closed position; and

Fig. 3 is a horizontal sectional view similar to the right hand side of Fig. 2, but showing the door in partially open position.

The invention proposes an improved weatherstrip arrangement for the rear edge of a railway box car door of the type that is slidable longitudinally of the car. A spark strip having a cross section substantially in the shape of a channel has one flange secured to the side wall of the car and is provided with a boss on the other flange thereof. A reversely flanged resilient metal weatherstrip element is positioned in the channel and has one end secured to the side wall. A rear edge member on the door has a flange spaced from the door which, when the door is closed, projects between and contacts the boss on the spark strip mounted in the channel and the flange of the resilient element, compressing the element in a direction transversely of the car and toward the side wall. When the door is opened the flange on the door member withdraws from its position between the free end of the resilient element and the flange of the spark strip and the element, due to its resiliency, then expands toward flange of the spark strip until its free end contacts the flange.

In the drawings, 10 generally designates a side wall of a railway box car. The side wall 10 has outside sheathing 11, a sill 12 secured to the sheathing, a side sill reinforcement 13 depending from the side sill and secured thereto, a side plate 14 secured to the sheathing, and a door opening 15. Spaced brackets 16 are secured to the side sill reinforcement 13 and a track 17 is disposed below the door opening 15 and is seated upon the brackets and secured to the brackets and the reinforcement. A top retainer 18 is disposed over the door opening 15 and is secured to the side plate 14. A door 19 is mounted on the side wall 10 for slidable movement longitudinally of the car and over the door opening 15. The door 19 has housings 20 at the bottom thereof and rollers 21 are rotatably mounted in the housings. The rollers 21 roll upon the track 17 and a flange at the bottom of the door 19 projects behind the track to hold the bottom of the door in place and the top of the door projects under the top retainer 18 which holds the top of the door in place.

Door posts 22, L-shaped in cross section, are positioned at the front edge of the door opening 15 and at the rear edge of the door opening and a wood nailer 23 is disposed against each door post. A spark strip or part 24 has a cross section in the general shape of a channel and has one flange 25 longer than the other flange 26 and a web 27 integrally connects both of the flanges and the flange 25 is positioned between the rear door post and the sheathing 11. The flange 26 of the spark strip 24 is bent so as to provide a boss 28 thereon and in effect this boss projects from the inner face of the flange. A reversely flanged or S-shaped resilient metal weatherstrip element 29 has one arm 30 longer than the other arm 31 and a web 32 integral with the arms. The arm 31 has a portion 45 arranged diagonally of the web 32 and integral therewith and a portion 46 arranged generally parallel with the arm 30 and integral with the portion 45. The element 29 is preferably made from bronze. The element 29 is positioned in the channel 24 and has its longer arm 30 disposed between the flange 25 of the channel and the sheathing 11. A plurality of spaced rivets 33 extend through the sheathing 11 and the longer arm 30 of the weatherstrip element 29 and the longer flange 25 of the channel and the flange of the rear door post 22 securing.
the element and the channel to the side wall 10. A member 34 is positioned at the rear edge of the door 19 and is secured thereto and has a flange 35 spaced from a plane passing through the inner face of the door.

A front stop or part 36 is made up of a long flange 37 and a flange 38 integral with and at right angles to the flange 37 and the flange 38 is bent so as to form a channel 39 therein. The long flange 37 is positioned between the flange of the door post 22 and the sheathing 11 and a plurality of rivets 40 extend through the sheathing and the flange 37 and the flange of the door post. The lower end of the front stop 36 is also riveted to the side sill 12 and the side sill reinforcement 13 by rivets. The manufacturers edge of the door 19 has a member 41 secured thereto.

When the door is closed the member 41 at the front edge of the door projects into the channel 39 in the front stop 36 and the flange 35 on the member 34 at the rear edge of the door slidably contacts the portion 45 and portion 46 and contacts the boss 28 on the flange 26 of the spark strip 24 and the portion 46 of the element 29 compressing the element in a direction transversely of the car and at right angles with the side wall 10 and toward the side wall to form a weatherseal, all as best shown in Figure 3.

When the door is opened the flange 35 on the member 34 at the rear edge of the door withdraws from its position between the flange 26 of the spark strip 24 and the portion 46 of the element 29 and the element, due to its resiliency, expands toward the flange 26 until the portion 46 contacts the boss 28 on the flange, as best shown in Figure 3.

The safety latch mechanism made up of the parts 42 and 43 serves to hold the door in closed position. The lock assembly 44 serves to lock the door after it has been closed.

The element 29 because of its S-shape can exert a comparatively great amount of force against the flange 35 of member 34 which assures that it will be almost impossible for foreign matter to get past the element 29 and flange 35. The spark strip 24 and the weatherstrip element 29 and the free end of the door flange 35 form an enclosure or first pocket which is effective to trap foreign matter and the U-shaped part of the member 24 together with the weatherstrip 29 also form a second pocket which is effective to trap foreign matter while the U-shaped portions of the member 34 form a third pocket which together with the edging effect of the depression in the spark strip 26 created by the boss 28 effectively prevents the passage of weather and also acts completely to exclude the passage of light.

In a manufacture of railway box cars the width of the door opening in the side walls is not always exactly the same for each car. Therefore, the width of the door opening in one car will be slightly different than the width of the door opening in another car manufactured according to the same specifications. The width of the flange 35 at the rear and of the door will also vary slightly with doors manufactured according to the same specifications.

The portion 46 of the weatherstrip makes contact with the flange 35 of the door over a large surface area and the greater the surface area the more effective will be the seal against the entrance of foreign matter. With the portion 46 of the weatherstrip making contact with the flange 35 of the door over an extended surface area the weatherstrip will always be effective to form a seal regardless of variations in the width of the door opening or the width of the flange 35. The surface area of contact will vary since the width of the door opening and the width of the flange 35 vary and under extreme conditions when the door opening has its smallest width and the flange has its smallest width there will be at least contact between the portion 46 of the weatherstrip and the flange 35 on the door. Thus the weatherstrip is effective at all times to form a seal regardless of variations in the width of the door opening or in the width of the flange 35 on the door.

When the cars with doors presently in use are built, shop variations make it necessary to fit both the front edge and the rear edge of the door. The present door rear edge construction makes it possible to fit only the front edge of the door because the rear edge will make contact with the door frame when opening and automatically provide a seal against weather regardless of shop variations.

From the foregoing it will be seen that there has been provided an improved weatherstrip arrangement for the rear edge of a railway box car door which effectively prevents smoke, cinders and the like from entering the car and which completely excludes the passage of light.

What is claimed is:
1. In a railway freight car having a side wall including a door opening, a door mounted on the side wall for slidable movement longitudinally of the car and over the door opening, a spark strip having a cross section in the shape of a channel having one flange secured to the rear edge of the door opening, a generally S-shaped resilient metal element having a web disposed in a single plane and a first arm secured to the web and disposed in a single plane and a second arm having a portion arranged diagonally of the web and disposed in a single plane and a portion arranged generally parallel with the first arm secured to the first named portion and disposed in a single plane and the width of the web being at least as great as the width of the second arm and the width of the first arm being at least as great as the width of the web, the resilient element being positioned in the channel and the first arm being secured to the side wall, and a member on the rear edge of the door having a flange in spaced parallel relation with the plane of the inner face of the door, the flange on the member slidably contacting said first named portion and projecting between the other flange of the channel and the second named portion of the resilient element compressing the element in a direction transversely of the car and toward the side wall to form a weatherseal when the door is closed.

2. In a railway freight car having a side wall including a door opening, a door mounted on the side wall for slidable movement longitudinally of the car and over the door opening, a spark strip having a cross section in the shape of a channel having one flange secured to the rear edge of the door opening, a generally S-shaped resilient metal element having a web disposed in a single plane and a first arm secured to the web and disposed in a single plane and a second arm having a portion arranged diagonally of the web and secured thereto and disposed in a single plane and a portion arranged generally parallel with the first arm secured to the first named portion and disposed in a single plane and the width of the web being at least as great as the width of the second arm and the width of the first arm being at least as great as the width of the web, the resilient element being positioned in the channel and the first arm being secured to the side wall, and a member on the rear edge of the door having a flange in spaced parallel relation with the plane of the inner face of the door, the flange on the member slidably contacting said first named portion and projecting between the other flange of the channel and the second named portion of the resilient element compressing the element in a direction transversely of the car and toward the side wall to form a weatherseal when the door is closed.

3. In a railway freight car having a side wall including a door opening, a door mounted on the side wall for slidable movement longitudinally of the car and over the door opening, a spark strip having a cross section in the shape of a channel having one flange secured to the rear edge of the door opening, a generally S-shaped resilient metal element having a web disposed in a single plane and a first arm secured to the web and disposed in a single plane and a second arm having a portion arranged diagonally of the web and secured thereto and disposed in a single plane and a portion arranged generally parallel with the first arm secured to the first named portion and disposed in a single plane and the width of the web being at least as great as the width of the second arm and the width of the first arm being at least as great as the width of the web, the resilient element being positioned in the channel and the first arm being secured to the side wall, and a member on the rear edge of the door having a flange in spaced parallel relation with the plane of the inner face of the door, the flange on the member slidably contacting said first named portion and projecting between the other flange of the channel and the second named portion of the resilient element compressing the element in a direction transversely of the car and toward the side wall to form a weatherseal when the door is closed.

4. In a railway freight car having a side wall including a door opening, a door mounted on the side wall for slidable movement longitudinally of the car and over the door opening, a spark strip having a cross section in the shape of a channel having one flange secured to the rear edge of the door opening, a generally S-shaped resilient metal element having a web disposed in a single plane and a first arm secured to the web and disposed in a single plane and a second arm having a portion arranged diagonally of the web and secured thereto and disposed in a single plane and a portion arranged generally parallel with the first arm secured to the first named portion and disposed in a single plane and the width of the web being at least as great as the width of the second arm and the width of the first arm being at least as great as the width of the web, the resilient element being positioned in the channel and the first arm being secured to the side wall, and a member on the rear edge of the door having a flange in spaced parallel relation with the plane of the inner face of the door, the flange on the member slidably contacting said first named portion and projecting between the other flange of the channel and the second named portion of the resilient element compressing the element in a direction transversely of the car and toward the side wall to form a weatherseal when the door is closed.
A plane and a second arm having a portion arranged diagonally of the web and secured thereto and disposed in a single plane and a portion arranged generally parallel with the first arm secured to the first named portion and disposed in a single plane, the resilient element being positioned in the channel and the first arm being secured to the side wall, and a member on the rear edge of the door having a flange spaced from the door, the flange on the member slideably contacting said first named portion and projecting between the other flange of the channel and the second named portion of the resilient element compressing the element in a direction transversely of the car and toward the side wall to form a weatherseal when the door is closed.

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