Oct. 29, 1968 W. O. NYSTROM 3,407,536

SLIDING DOOR

Filed June 22, 1966 2 Sheets-Sheet 1

FIG. 2

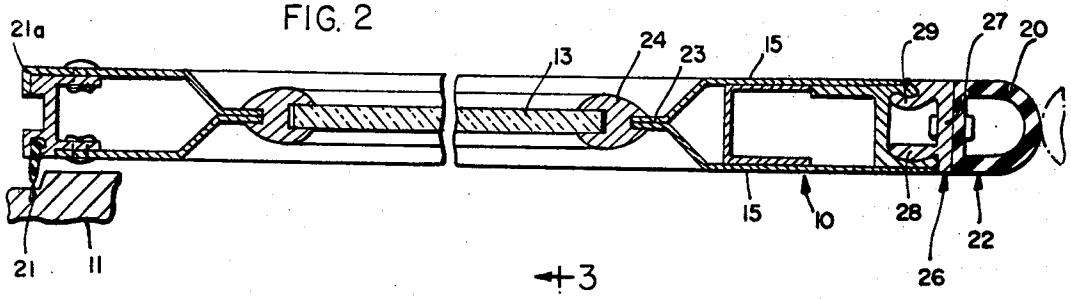
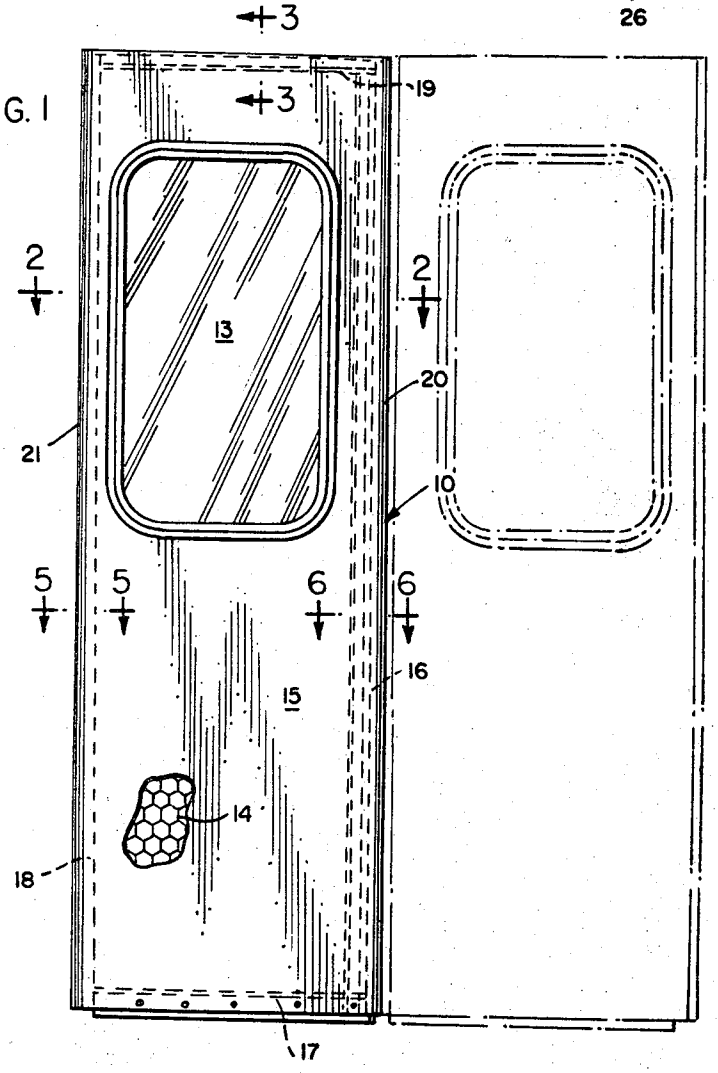


FIG. 1



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FIG. 4

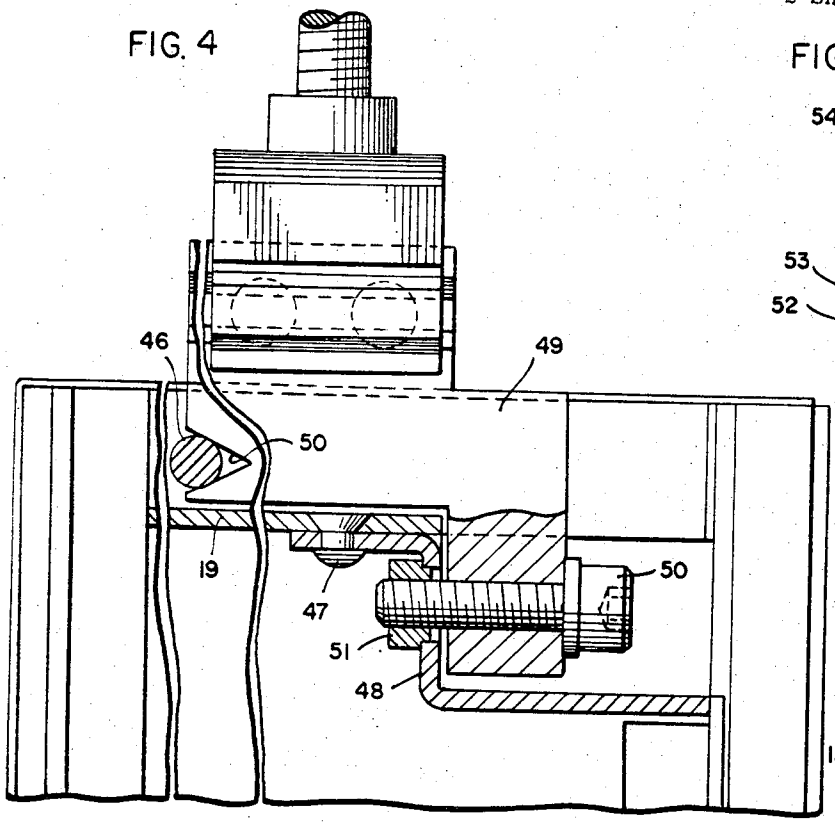


FIG. 3

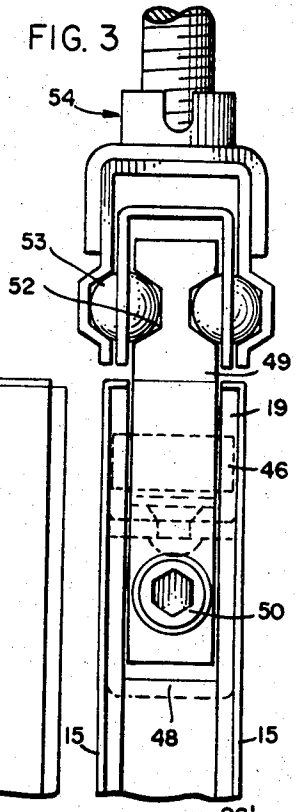


FIG. 5

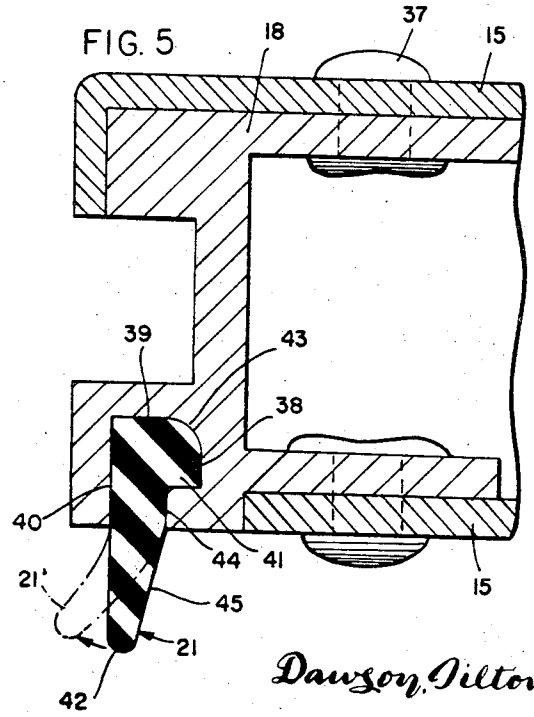
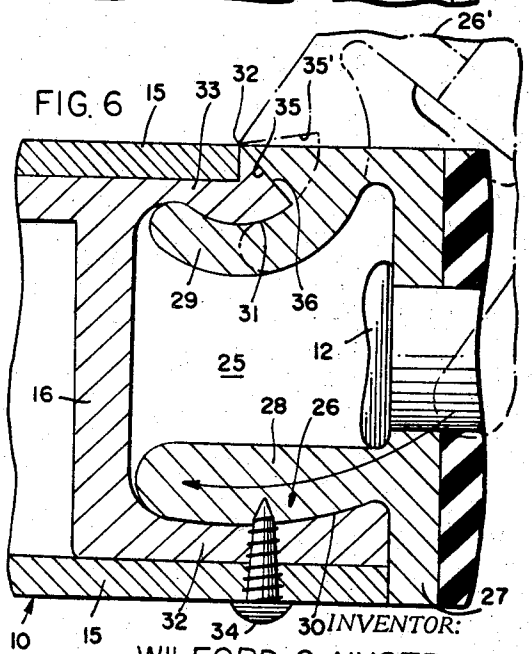


FIG. 6



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3,407,536
Patented Oct. 29, 1968

3,407,536

SLIDING DOOR

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Filed June 22, 1966, Ser. No. 559,630
2 Claims. (Cl. 49—482)

ABSTRACT OF THE DISCLOSURE

A subway car sliding door equipped with rigidifying and edge closing means wherein the leading side of a door has a longitudinally-extending recess equipped with an elongated arcuately flanged extrusion member carrying a resilient guard, the rear edge of the door having an L-shaped slot carrying a generally L-shaped resilient strip.

SUMMARY OF INVENTION

For side-entry doors in subway cars which are frequently opened, the invention provides uniquely constructed seals and reinforcements, these constituting principal objectives of the invention.

The invention is explained in conjunction with the accompanying drawing, in which:

FIG. 1 is an elevational view of a door constructed according to the teachings of this invention;

FIG. 2 is an enlarged fragmentary sectional view taken along the line 2—2 of FIG. 1;

FIG. 3 is an enlarged fragmentary sectional view taken along the line 3—3 of FIG. 1;

FIG. 4 is a fragmentary sectional elevational view corresponding to that taken at right angles to FIG. 3;

FIG. 5 is an enlarged fragmentary sectional view taken along the line 5—5 of FIG. 1; and

FIG. 6 is an enlarged fragmentary sectional view taken along the line 6—6 of FIG. 1.

Referring now to FIG. 1, the numeral **10** designates generally a sliding side door for a vehicle such as a subway car. The door coacts with a car frame portion (seen only fragmentarily and designated by the numeral **11** in FIG. 2) and a second identical sliding door aligned in the opposite direction (shown in phantom in FIG. 1). The door **10** has a window **13** provided in its upper central portion and is defined by a pair of facing sheets enclosing a kraft hexagonal honeycomb **14**. The edges or perimeters of the sheets **15** making up the door **10** are integrated by means of perimetric channels as at **16**, **17**, **18** and **19** (proceeding clockwise around from the front or leading edge **20**). The rear or trailing edge **21***a* coacts with the frame portion **11** to provide a seal (using a strip generally designated **21**). The forward or leading edge of the door as at **20** includes a finger guard of resilient material and designated generally by the numeral **22**, which coacts with an identical edge of a second door facing in the opposite direction.

The frame sheets **15** are spot-welded together in the area designated **23** (see FIG. 2) to define an opening for the window **13**, and a window frame of suitable resilient material and designated **24** in FIG. 2 is provided for supporting the pane of glass constituting the transparent portion of the window **13**.

A problem has existed relative to the replaceability of the finger guards **22** which, as will be appreciated, can wear relatively rapidly, at least in comparison with the remainder of the door and frame construction and which is an inviting target for vandals' knives. The means for mounting the finger guard **22** in a unique fashion can be seen in enlarged form in FIG. 6. There, the face-providing sheets **15** of the door **10** are seen to be spaced

apart by means of a channel **16**. Channel **16** ordinarily is welded to the sheets **15** as by spot-welding.

The channel or element **16** provides a recess **25** (still referring to FIG. 6) which is adapted to receive an elongated extrusion member generally designated **26**. The member **26** is essentially pi-shaped, consisting of a flat plate portion **27** and rearwardly-extending legs **28** and **29**. The legs **28** and **29** are seen to be arcuately contoured at least along one elongated face thereof as at **30** and **31**, respectively, for coaction with correspondingly arcuately contoured leg portions **32** and **33** provided by the channel element **16**. The mode of operation can be appreciated from the dotted line showing designated **26'** in FIG. 6 wherein the member **26** is in the process of installation, a fulcrum or pivot point being developed at the point **32**. It will be noted that the radius of curvature of the leg **29** and leg portion **33** in the confronting arcuate elongated surfaces thereof is considerably less than the confronting arcuate surfaces of the leg **28** and leg portion **32**. Also, the provision of legs and leg portions develops a slight springiness or compression, causing the member **26** to remain tightly seated when in place so as to maintain the finger guard **22** in position. The assembly of finger guard **22** and member **26** is advantageously releasably secured in place to the sheet **15** and channel **16** by means of screws **34**. The finger guard **22** is secured to the flat plate **27** by means of pins or rivets **12**.

Pivoting and seating of the member **26** is facilitated by virtue of providing angular bearing surfaces on the leg **29** and leg portion **33** as at **35** and **36**, respectively, the surface **35** being designated **35'** in the broken line showing of FIG. 6.

The arrangement just described provides a superior operation in not only being more readily removable than prior constructions which required special tools therefor, but also by being more rigid, tending to form a tubular construction under stress and thereby being capable of more rigidity without excessive deflection.

At its rear or trailing edge, the door is characterized by another novel construction which includes the weatherstrip **21** and which is seen in enlarged fragmentary form in FIG. 5. In FIG 5, the sheets **15** are seen to be integrated by means of the channel **18** which additionally may be riveted by means of elements **37** as well as the welding previously referred to. The channel **18** is equipped with a longitudinally-extending slot **38** on the outside face thereof and which is generally L-shaped, having a base portion **39** and an upstanding portion **40**. The base portion **39** extends in the direction of the leading or forward edge of the door **10**, i.e., the edge equipped with the finger guard **22**.

In like fashion, the weatherstrip **21** is also L-shaped, having a base portion **41** and an outstanding portion **42**. As the door closes, contact of the strip **21** with the frame portion **11** tends to deform the strip **21** to the dotted line configuration designated **21'** in FIG. 5, and thus tends to seat the strip **21** even more firmly within the slot **38**. Thus, the strip **21** is installed without the need for elaborate securement, facilitating removal and replacement of this wearable element.

I have found it advantageous to employ a weatherstrip **21** of the construction shown, wherein the exterior terminal portions of the strip **21** and slot **38** are arcuately curved as at **43** in FIG. 5, and further where the connective portion **44** of the outstanding portion **42** is generally perpendicular to the length of the base portion **39**. In proceeding toward the terminal portion of the outstanding portion **42**, the strip **21** is tapered as at **45**.

In operation, the guard **22** and strip **21** coact to seal the door **10** within the opening provided by the frame portions **11** and the opposing coacting door. Any shock applied to the resilient elements **21** and **22** is trans-

mitted to the superiorly reinforced door without the tendency to excessively distort the door or detach the sealing elements **21** and **22** from their mountings.

As shown in FIG. 3, the inventive door is mounted for slidable movement thereof. The sheets **15** are equipped with a top channel **19** having pin **46** extending transversely therethrough adjacent the trailing edge of the door. Extending downwardly from channel **19** and attached thereto by rivet **47** is bracket **48**. Hanger bar **49** is received within channel **19** and is provided with a notch as at **50** which is drawn into tight engagement with pin **46** by means of bolt **50**, which extends through bar **49** and bracket **48** and is threadedly engaged by nut **51**. Bolt **50** may be provided with an Allen head so that it may be tightened and loosened with an Allen wrench without disassembling the door.

The bar **49** is equipped with longitudinally-extending grooves as at **52** for the receipt of ball bearings **53** provided as part of a hanger arrangement generally designated **54**. The door is thus supported by the notched portion of bar **49** and the bolt **50** extending through bar **49**.

The hanger-lock arrangement not only rigidifies the upper section of the door but is readily accessible for removal and replacement, this being necessary when the door is to be removed. All that is required is the opening of the forward edge of the door by removing the closure member **26** to expose the bolt **50**. When the bolt **50** is removed, the pin **46** may be slid clear of notch **50** and the door removed from hanger structure **54**.

Even though bolt **50** is readily accessible, water and debris are prevented from reaching the inside of the door by bracket **48** which extends between opposing sheets **15**, thereby acting as a weather seal.

While in the foregoing specification a detailed description of an embodiment of the invention has been set down for the purpose of illustration, many variations in the details hereingiven may be made by those skilled in the art without departing from the spirit and scope of the invention.

I claim:

1. A generally rectangular sliding door having a longitudinally-extending recess in the forward edge

thereof, an elongated extrusion member removably engaged with said forward edge recess, and an elongated resilient guard secured to said member, said recess being defined by spaced arcuate flange means and said member comprising cooperating arcuate flange means whereby said member is adapted to be pivotally removed from its engagement with said recess flange means, said door having a longitudinally-extending slot in one face thereof adjacent the rear edge of said door, said slot being generally L-shaped in transverse section with the base of the L-shape extending toward the door forward edge, and an elongated integral resilient strip removably mounted in said slot, said strip being generally L-shaped in transverse section to generally conform to said slot whereby forward movement of said door to closing position tends to seat said strip firmly without the need of additional securing means.

2. The structure of claim **1** in which the transverse shape of said slot and strip are each defined by a base part and an upstanding part, the terminal outer portion of the said base parts being arcuate, the connective interior portion of said upstanding part being generally normal to the length of said base part with the remaining interior portion of said upstanding part being angularly related to said base part length to provide an upstanding part tapered adjacent its terminal interior portion.

References Cited

UNITED STATES PATENTS

1,947,736	2/1934	Potter	49—488 X
1,967,456	7/1934	Swedman et al.	49—489 X
2,010,520	8/1935	Kiekert	49—488 X
2,121,826	6/1938	Roberts	49—488 X
2,583,978	1/1952	Watter et al.	49—482 X
3,029,052	4/1962	Early et al.	52—588 X
3,055,461	9/1962	De Ridder	52—588
3,111,205	11/1963	Gresham	52—588
3,299,596	1/1967	Neal et al.	49—488 X

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