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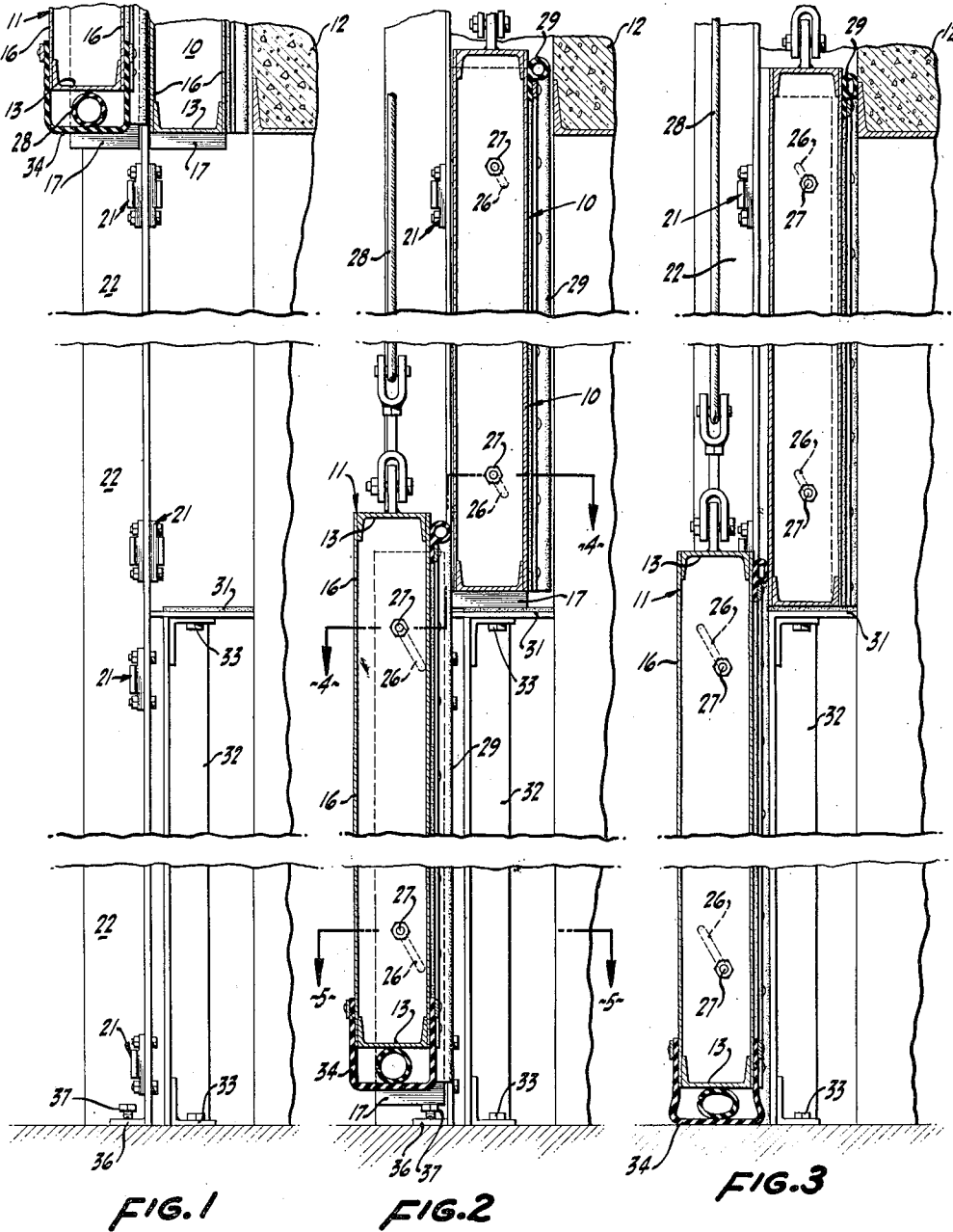
H. W. COOKSON, JR., ET AL

2,763,036

DOOR CONSTRUCTION

Filed May 15, 1953

2 Sheets-Sheet 1



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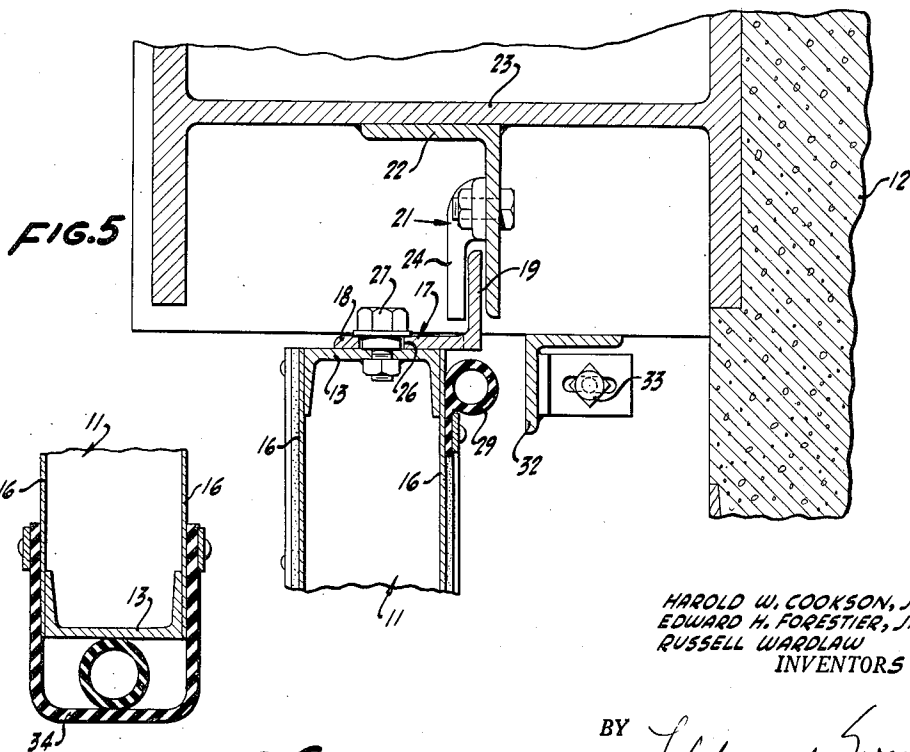
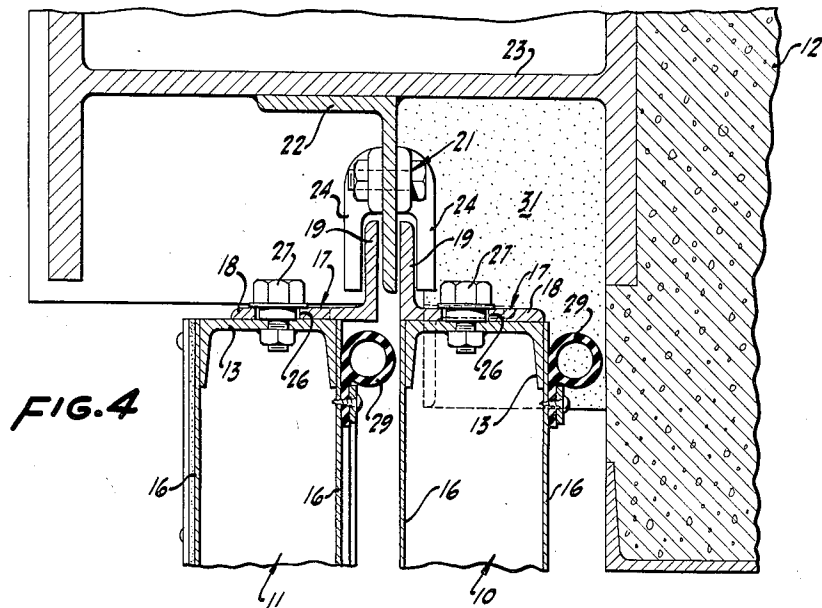
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2,763,036

DOOR CONSTRUCTION

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5 Claims. (Cl. 20—19)

This invention relates generally to sliding door constructions, either vertical or horizontal, and particularly to doors of this kind which are adapted to provide air and dust tight seals for warehouses and other types of structures.

In the past sliding doors of this type have been subject to various difficulties, the principal among them being that the sealing surfaces, either the faces of the doors themselves or in some instances, weather stripping which is applied to the surface of the door, was subjected to severe wear and scuffing which ultimately rendered the door unfit for the purpose for which it was intended.

In addition to reducing the effectiveness of the sealing surfaces, the scuffing and wear also provided a substantial maintenance problem.

It is an object of this invention to provide a sliding door construction which is particularly useful for hermetically sealing various enclosures such as warehouses.

It is another object of this invention to provide a device of this kind in which maintenance will be reduced to a minimum.

It is a further object of this invention to provide a sliding door construction of this type which can be used either with single or multiple door operation.

It is a further object of this invention to provide a novel construction of the above type which makes use of either the surfaces of the door or a resilient deformable strip which may be affixed thereto to provide a seal between the door and the chamber which is adapted to be sealed and which engages both these parts only when the door is in fully closed position.

Other objects and advantages of this invention will appear from the following specification taken in conjunction with the accompanying drawings in which:

Figure 1 is a side elevational view, partly in cross-section, showing a pair of vertical sliding doors in full open position;

Figure 2 is a side elevational view, partially in cross-section, showing a pair of doors in almost fully lowered position;

Figure 3 is a side elevational view partially in cross section showing a pair of doors in fully lowered position;

Figure 4 is a cross sectional detail taken along the line 4—4 of Figure 2;

Figure 5 is a cross sectional detail taken along the line 5—5 of Figure 2; and

Figure 6 is a cross sectional detail of the bottom portion of the bottom leaf of one of the doors.

The sliding doors illustrated in Figure 1 consist of a top leaf 10 and a bottom leaf 11 which is adapted to seal a doorway in a wall 12. The wall 12 can be of any suitable material such as reinforced concrete and the doors 10 and 11 can be fabricated of any suitable material. We have shown them, in the preferred embodiment illustrated herein, to be fabricated from steel. The top, bottom and side edges of the doors may be formed

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of suitable channel members 13, for example, and the larger wall panels may be formed of steel sheets 16.

The doors are adapted to be raised and lowered vertically. The sides of each door are provided with a guide member 17 which is preferably formed in the shape of an angle, one leg 18 of the angle lying flush against the side wall 13 and the other leg 19 extending at right angles thereto. The legs 19 are adapted to run in suitable guide channels 21. As illustrated particularly in Figure 4, the guide channels 21 are secured to a stationary vertical upright member 22 which is held in rigid spaced relationship to the wall 12 as, for example, by an outwardly extending I beam 23. The channels 21 are formed by shoes 24 which are bolted to the member 22. It is apparent, of course, that a single shoe 24 may extend the entire length of the member 22 or that a number of shorter shoes may be used, as shown, to form in effect a single long guide channel, it being sufficient that they provide, together with the member 22, a pair of vertical channels which are adapted to receive the legs 19 of the angle members 17.

The legs 18 of the angle members 17 are provided with slots 26 which, it will be noted, are set at an angle to the vertical. The members 17 are secured to the side walls 13 of the doors 10 and 11 respectively by studs 27 which pass through the slots 26 and hold the members 17 in slidable engagement with the doors 10 and 11. As illustrated the slots 26 are set at an angle of approximately 30° but this angle is not critical.

Raising and lowering of the doors 10 and 11 is controlled by conventional raising and lowering mechanism which may consist of any suitable winch arrangement. Generally speaking, raising and lowering cables 28 are attached to the doors 10 and 11 by a suitable clevis arrangement, and serve to raise the doors to the position illustrated in Figure 1 and to lower them to the position illustrated in Figure 3. It should be borne in mind that, in Figures 2 and 3, the slots 26 shown in dotted lines, are the slots in the legs 18. There are no slots in the side walls 13 of the door members 10 and 11.

It will be noted that the inner face of each of the doors 10 and 11 is adapted to engage the side walls of the building to provide a seal therewith. The top and side edges may be so constructed that when they engage the side walls of the building they form a suitable seal or they may be provided with a resilient, deformable molding 29 which is adapted to engage the wall 12. The top of the door 11 is adapted to engage and form a seal with the lower front face of the door 10 and the sides of the door 11 are adapted to engage the angle 32. It will be noted that the angle 32 is secured to the building 12 in such a manner that no air or moisture can pass between them. The bottom of the door 11 is provided with a resilient sealing member 34 which is adapted to engage the floor or ground and effect a seal with respect thereto. If the faces of the doors are provided with a resilient deformable molding 29, a suitable seal is also provided.

We provide stop plates 31 which are adapted to determine the end of the downward movement of the guide members 17. The guide member 17 on the door 10 is adapted to strike the stop plate 31 at a predetermined point before the door 10 reaches its terminal position. It is provided with an adjusting means 33 which consists of a bolt which the member 17 is adapted to strike. The guide member 17 on the door 11 may strike the floor or ground. However, we have provided a lip 36 thereon which is also provided with an adjustment means consisting of a bolt 37 so that its downward movement may be limited.

Operation of the device may briefly be described as follows: Let it be assumed that the doors 10 and 11 are at

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full elevated position. The lowering mechanism will permit the same to slide downwardly. The guide legs 19 which are positioned in the vertical channels 21, grooves formed by the members 22 and the shoes 24 will maintain the doors in a substantially vertical path. The guide members 17 will, by gravity, remain at their lowermost position. In other words, the bolts 37 will be positioned generally as illustrated in Figure 2 with respect to the slots 26 and the doors 10 and 11 will be generally spaced from the wall 12 and from each other in the position illustrated in Figure 2. However, as the doors approach the lower end of their runs, the guide members 17 will first engage the ground or the stop plate 31 (as the case may be) whereby further downward movement of the members 17 will be terminated. However the doors 10 and 11 will continue to move downwardly. The studs 27 will ride down the slots 26 thereby serving to cam the doors to the positions illustrated generally in Figure 3 in which position both doors have been urged to the right. If the doors are provided with a molding, the molding 29 about the upper door 10 will engage the wall 12; the top portion of the molding 29 around the door 11 will engage the lower portion of the door 10 and the molding along the sides of the door 11 will engage the angle 22 which is suitably secured to provide a hermetic seal with respect to the building 12. The deformable lower gasket member 33 will engage the floor and be deformed generally as illustrated in Figure 3. If no molding is provided, the door 10 will engage the side walls 12 of the building and the top of the door 11. The door 11 will engage the angles 22 and thus provide a seal. It is also apparent that the same method may be employed for use on doors which are moved horizontally into and out of closed or sealing position.

When the doors 10 and 11 are raised, the studs 27 will ride upwardly in the slots 26 thereby serving to cam the doors 10 and 11 to the left (see Figure 2), away from the building 12. The angle member 17 which is secured to the door leaf 10 is adapted to engage a stop plate 31. In this manner wear or loss of resiliency of the molding 29 may be compensated for. In a like manner the lip 36 restricts the downward travel of door 11.

It will be noted that the slots 26 on the member 17 on the door 11 are substantially longer than the similar slots on the angle 17 secured to the member 10. This is for the reason that the door 11 must be moved to the right, as viewed in Figure 3, approximately twice the distance to afford a perfect seal and, when being raised, it must likewise be moved approximately twice the distance to the left to provide ample clearance.

We claim:

1. In a sliding door construction adapted for use with upright and horizontal framing members forming a doorway, a door slidable over said doorway and movable between open and closed positions, vertical guide channels mounted on the upright framing members, tongue members carried by said door and slidably engaging said channels, said tongue members being slidably mounted on said door to permit limited lateral movement of said door relative to said tongue members, means for arresting the downward movement of said tongue members at a point before the door is moved to a fully closed position whereby upon continued movement of said door towards a fully closed position said door will be cammed into engagement with said upright and horizontal framing members to close said doorway.

2. A sliding door construction adapted for use with upright and horizontal framing members, a plurality of doors slidable over said doorway and vertically movable between open and closed positions, said doors when in open positions lying in adjacent parallel planes and in closed positions lying in vertically displaced parallel planes, a plurality of vertical parallel guide channels mounted on the upright framing members, a tongue member carried by each of said doors and slidably engaging

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one of said guide channels, said tongue members being slidably mounted on said doors to permit limited lateral movement of said doors relative to said tongue member, means for arresting the downward movement of said tongue members at a point before the doors have been moved to fully closed positions whereby upon continued movement of said doors towards a fully closed position said doors will be cammed into engagement with each other and with said upright and horizontal framing members to close said doorway.

3. A sliding door construction as in claim 1 together with sealing means fastened to the side and top inner edges of said door, and sealing means mounted on the bottom edge of said door, said last named sealing means comprising a resilient tubular member mounted on the bottom edge of said door and a resilient boot fastened to the inner and outer bottom side edges of said door and enclosing said tubular member.

4. In a sliding door construction adaptable for use with upright and horizontal framing members forming a doorway, a door slidable over said doorway and movable between open and closed positions, a vertical guide channel mounted on each side of said doorway on said upright framing members, a tongue member carried by each side of said door and slidably engaging the associated guide channels, said tongue members being slidably mounted on said door to permit limited lateral movement of said door relative to said tongue members, sealing means mounted on the inner side and top edges of said door, sealing means mounted on the bottom edge of said door, said last named sealing means comprising a boot fastened to the inner and outer bottom edges of said door and a tubular member enclosed within said boot and extending the length of the bottom edge of the door, stop means adapted to engage the lower edges of said tongue members for arresting the downward movement of said tongue members at a point before the door has been moved to a fully closed position whereby upon continued movement of said door toward a fully closed position said door will be cammed into sealing engagement with said upright and horizontal framing members and the floor.

5. In a sliding door construction adaptable for use with upright and horizontal framing members forming a doorway, a plurality of doors slidable over said doorway and vertically movable between open and closed positions, said doors in the open positions lying in adjacent parallel planes and in closed positions lying in vertically displaced parallel planes, a plurality of vertical parallel guide channels mounted on each side of the doors on the upright framing members, tongue members carried by the sides of said doors and slidably engaging said guide channels, said tongue members being slidably mounted on said doors to permit limited lateral movement of said doors relative to said tongue members, sealing means fastened to the side and top inner edges of each of said doors, sealing means fastened to the bottom edge of the bottom door, said last named sealing means comprising a boot fastened to the inner and outer edges of the bottom edge of said door and a tubular member extending the length of the bottom edge of the bottom door and enclosed within said boot, stop means for arresting the downward movement of said tongue members at a point before the doors have been moved to fully closed positions whereby upon continued movement of said doors toward fully closed positions said doors will be cammed into sealing engagement with each other and with said upright and horizontal framing members.

References Cited in the file of this patent

UNITED STATES PATENTS

2,121,826	Roberts	June 28, 1938
2,180,177	Ternstrom	Nov. 14, 1939
2,199,182	Leonard	Apr. 30, 1940
2,653,359	Burrows	Sept. 29, 1953