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2,199,182

SEALING MECHANISM FOR SLIDABLE DOORS

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2 Sheets-Sheet 1

Fig. 1.

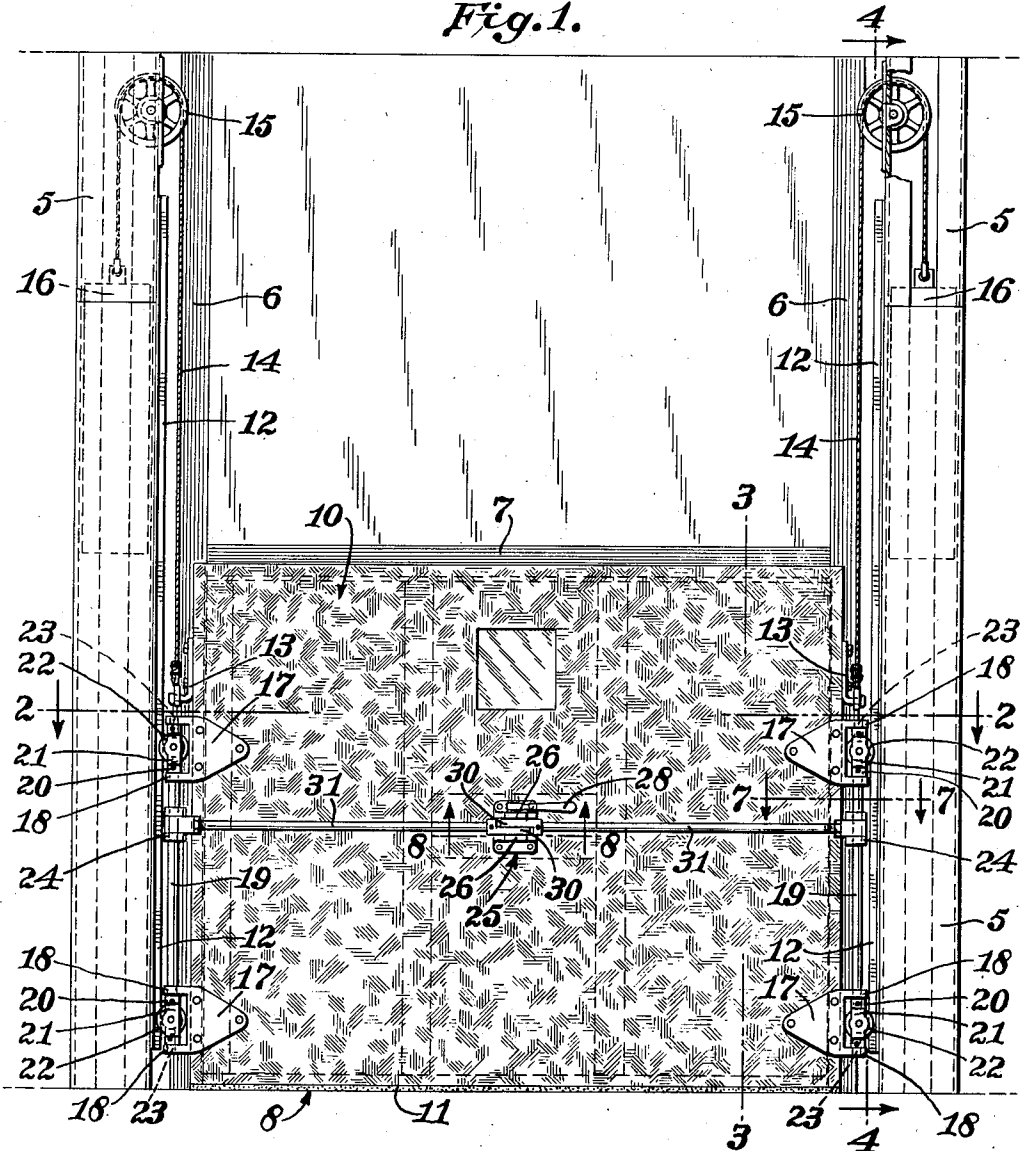
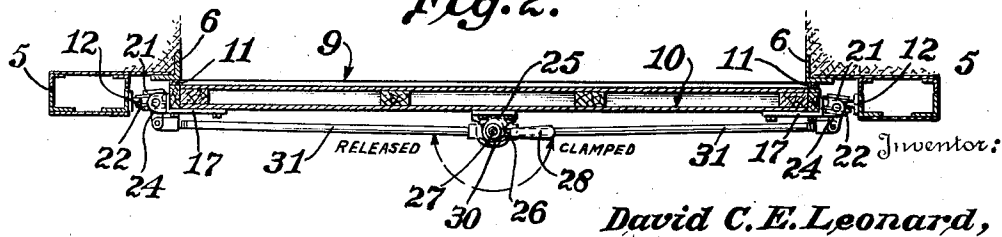


Fig. 2.



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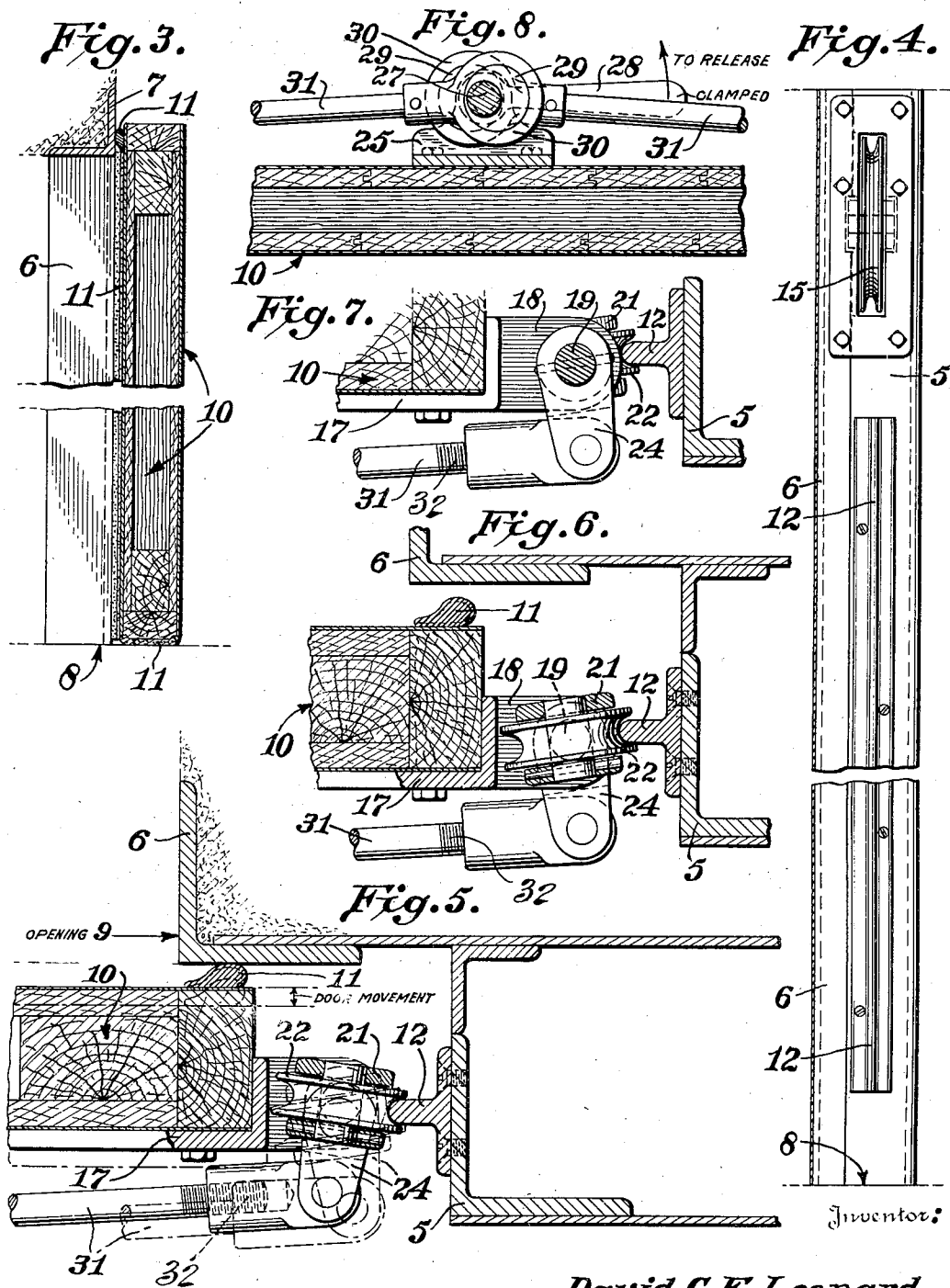
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SEALING MECHANISM FOR SLIDABLE
DOORS

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Application September 14, 1938, Serial No. 229,961

3 Claims. (Cl. 20—19)

The invention relates generally to sliding door equipments, and more particularly to certain new and useful improvements in supporting, guiding and sealing mechanisms for doors of the vertically-slidable type employed in refrigerating and cold storage equipment.

Among the objects of the invention is to provide novel supporting, guiding and sealing mechanism of the character stated which includes vertical guide ribs opposed to the lateral edges of the door, anti-friction rollers grooved to receive the guide ribs and supported at the door edges for rotation in the generally vertical plane of the door and for rocking movement about vertical axes so as to cause the door to move inwardly into sealing contact over the opening which it serves or outwardly out of such sealing contact, and means for simultaneously rocking the roller equipments at opposite side edges of the door into the seal effecting or seal releasing positions.

Another object of the invention is to provide novel means for imparting the rocking movement to the roller equipments including a rock shaft for rockably mounting the rollers at each side edge of the door, a crank arm secured to each shaft, an actuator shaft rockable about a vertical axis and supported on the body of the door so as to be adaptable to 180° of movement, a pair of eccentric disks having their axes of eccentricity substantially diametrically opposed in a general plane disposed parallel that of the door, and a thrust rod connected to each crank arm, each said rod having a strap encircling one of the disks.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more fully understood by following the detailed description, the appended claims, and the several views illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a face view illustrating the invention embodied in a door equipment of the vertically slidable type.

Figure 2 is a horizontal section taken on the line 2—2 on Figure 1.

Figure 3 is a vertical cross section taken on the line 3—3 on Figure 1.

Figure 4 is a vertical cross section taken on the line 4—4 on Figure 1.

Figure 5 is a fragmentary horizontal section taken through one side edge portion of the door and illustrating one roller in the door sealing and seal relieving positions in full and dotted lines respectively.

Figure 6 is a view similar to Figure 5 and illustrating the roller in the door seal relieving position.

Figure 7 is a fragmentary horizontal cross section taken on the line 7—7 on Figure 1.

Figure 8 is a fragmentary horizontal cross section taken on the line 8—8 on Figure 1.

In the drawings, I have illustrated a framing box 5 disposed vertically at each side of the doorway, and this frame boxing together with the vertical angles 6, the horizontal angles 7, and the floor or sill 8, define a door opening 9 adapted to be closed and sealed by the vertical slidable door 10.

The door is relatively flat and rectangular in shape and may be constructed in any suitable manner, preferably including suitable insulating material. At its upper edge and along its vertical edges, and also along its lower or floor engaging edge, the door is equipped with sealing gasket material generally designated 11.

A vertical guide rib 12 is secured to the face of each frame boxing 5 opposed to one of the lateral edges of the door, and at the upper portion of the door the edge surfaces thereof opposed to the rib 12 have secured thereto hanger brackets 13. To each bracket 13 is attached one end of a hanger cord 14, and each cord extends upwardly over an idler pulley 15 supported on the respective frame boxing 5, and downwardly within the boxing where it is secured to a counter-weight 16 vertically slidable within the respective boxing. While the box-like framing herein disclosed is desirable, it is to be understood that any suitable opening-defining framing and pulley-supporting means may be employed.

At each side edge of the door opposed to the adjacent guide rib 12 is mounted a pair of upper and lower or vertically-spaced brackets 17. Each bracket includes upper and lower spaced horizontal bearing ears 18, and a rocker rod 19 passes through the upper horizontal ear of each lower bracket and through the lower horizontal ear of each upper bracket, and each end of this rod extending into the bracket 17 is pin-secured to a rocker member 20 rockably mounted between the ears of the respective bracket. Each rocker member 20 has a central opening or bearing portion 21 in which is rotatably mounted an anti-friction roller 22 grooved at its periphery to straddle and ride on the opposed guide rib 12. Thus mounted, the rollers 22 are rotatable in the general plane of the door 10, as shown in Figures 5 and 6 of the drawings. The upper extremity of each uppermost rocker member 20

and the lower extremity of each lower rocker member 20 has a trunnion bearing as at 23 in the respective uppermost or lowermost ear 13 of the bracket 17.

5 A crank 24 is secured to each rod 19 between the upper and lower brackets 17, as shown in Figures 1, 6 and 7 of the drawings. It will be noted also, by reference to Figures 1, 2 and 8 of the drawings, that a bearing fixture 25 is secured
10 centrally to the door 10 and includes vertically-spaced upper and lower ears 26 in which an actuator shaft 27 is mounted for rotary movement through approximately 180°. One end of the shaft 27 is non-circular and equipped with
15 a handle 28 through which movement may be imparted to the shaft. Between the upper and lower ears 26, the shaft 27 is equipped with a pair of eccentric disks 29 secured upon the shaft with their axes of eccentricity diametrically op-
20 posed in a plane generally parallel the plane occupied by the door 10.

Each of the disks 29 is encircled by a strap 30 secured to the inner end of an actuator rod 31, each said rod being pivotally and adjustably
25 connected at its outer end with one of the crank members 24.

By rocking the shaft 27 about its axis by manipulation of the handle 28, the rods 31 can be moved simultaneously inwardly or outwardly.
30 When the rods are moved inwardly they draw the crank members 24 inwardly and shift the rollers 22 about the engaged edge of the ribs 12 to the position illustrated in Figure 5. When the rods are moved outwardly they shift the crank
35 members 24 outwardly and move the rollers to the position illustrated in Figure 6 of the drawings. The rollers being rockably mounted upon the door itself, this shifting of the plane of rotation of the rollers, or in other words the ful-
40 crumming of the rollers about the engaged edges of the ribs 12, will impart bodily movement to the door 10 to force it into sealing contact over the opening which it serves in the manner illus-
45 trated in Figure 5 of the drawings, or to remove it from such sealing contact in the manner shown in Figure 6 of the drawings.

It will be observed by reference to the drawings, and particularly to Figures 5, 6 and 7, that each rod 31 is adjustably threaded into the respective
50 crank member 24 as at 32 so that the positions of the crank members can be changed to compensate for gasket wear and assure proper sealing of the opening at all times.

While I have referred herein to doors of the
55 type employed in refrigerating and cold storage equipment, it is to be understood that doors of the nature of those herein disclosed are adaptable to use as closures for any rooms or spaces where-
60 in it is desired to maintain high, low or even temperatures by the provision of substantially airtight closures. Among such uses are those relating to refrigerating, heating, drying, incubation, fumigation and air conditioning.

It is to be understood that the specific struc-

ture and details herein described can be variously changed without departing from the scope of the invention as defined in the appended claims.

I claim:

1. The combination of a door and a doorway 5 or opening to be sealed thereby, means for slidably mounting the door including longitudinal guide ribs stationarily supported adjacent the side edges of the door and grooved anti-friction rollers engaging said ribs and rockably mounted
10 on the door adjacent the side edges thereof and on axes disposed within the peripheral limits of said rollers and paralleling the guide ribs and rotatable in a plane generally parallel that occupied by the door, and means for altering the
15 plane of rotation of the rollers by rocking them about the axes on which they are rockably mounted while maintaining contact of the rollers with the ribs for forcing the door against or relieving contact of the door with said doorway. 20

2. The combination of a door and a doorway or opening to be sealed thereby, means for verti-
25 cally-slidably mounting the door including frame standards, vertical guide ribs supported on the standards and opposed to the lateral edges of the door, a pair of brackets mounted in vertically spaced relation at each side of the door, a roller carrier rockable about a vertical axis on each bracket, a grooved roller mounted for rotation
30 in the general plane of the door on each carrier and straddling the respective guide rib, a crank arm and rock shaft connected with the upper and lower carriers at each side of the door, and means for moving said crank arms comprising a
35 pair of actuator rods, a shaft mounted on the door for 180° of rotation about a vertical axis, a pair of eccentric disks mounted on said shaft with their axes of eccentricity disposed diametrically opposite in the general plane of the door, each said rod having a strap encircling one said
40 disk, and means for imparting movement to said shaft.

3. The combination of a door and a doorway or opening to be sealed thereby, said door in-
45 cluding side edges overlying the doorway, means for mounting the door for sliding movement vertically including vertical guide ribs stationarily supported adjacent the side edges of the door, anti-friction rollers engaging said ribs, said
50 rollers being disposed between the ribs and the side edges of the doors, means carried by the doors for rockably supporting said rollers whereby said rollers may be shifted on axes disposed with-
55 in the peripheral limits of the rollers and paralleling the guide ribs, said rollers being disposed for rotation in a plane generally paralleling that occupied by the door and means for shifting the plane of rotation of the rollers by rocking the same about said axes while maintaining con-
60 tact of the rollers with the guide ribs for forcing the door against or relieving contact of the door with said doorway.

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