July 24, 1951 R. KLANNER 2,561,627

PIVOTED DOOR

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FIG. 2.

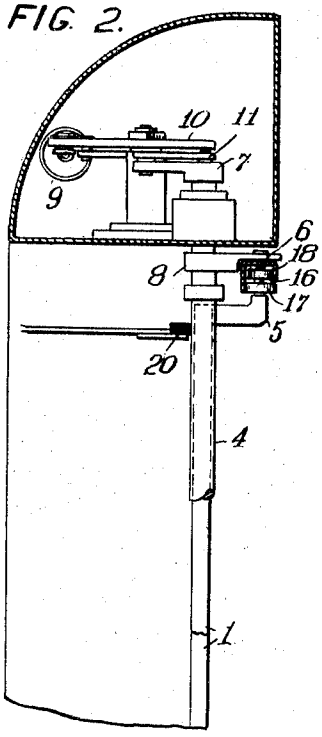


FIG. 1.

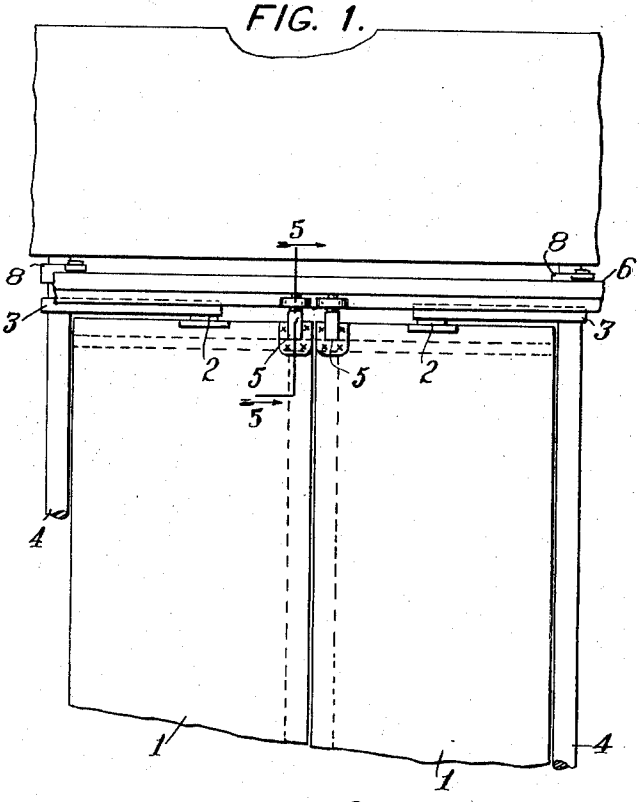
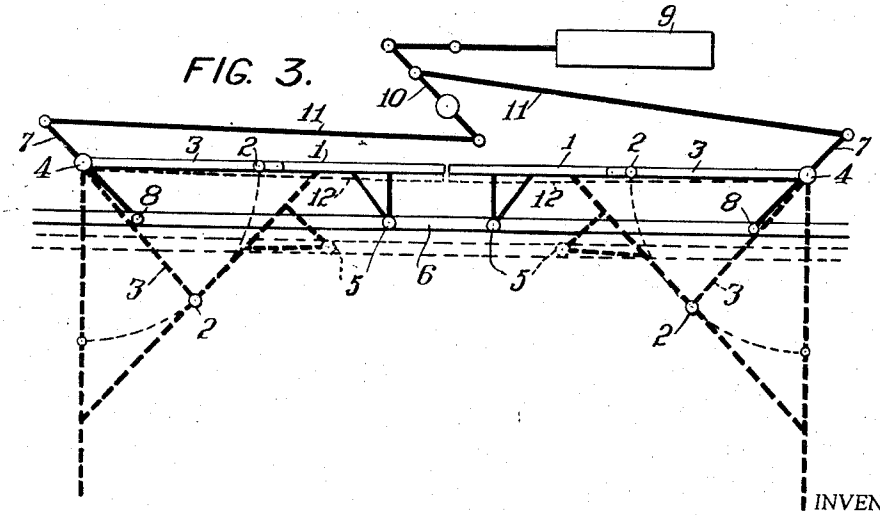


FIG. 3.



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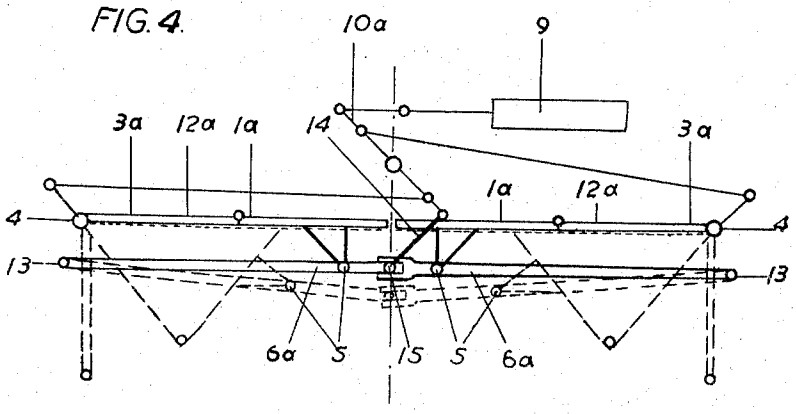
ATTORNEYS

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PIVOTED DOOR

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FIG. 4.



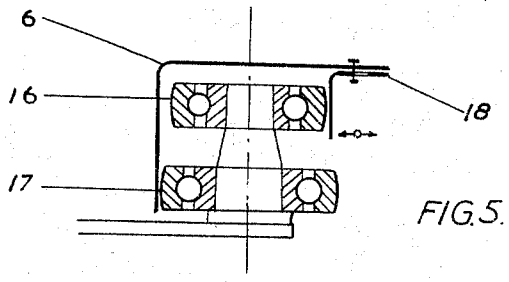


FIG. 5.

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PIVOTED DOOR

Rudolf Klanner, Vienna, Austria, assignor to Seetru Products Limited, Bristol, England, a corporation of Great Britain

Application November 28, 1950, Serial No. 197,866
In Austria December 22, 1948

5 Claims. (Cl. 160—213)

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This invention relates to pivoted wing doors having one-part wings or folding double wings, and has for its main object to provide a door mechanism so constructed that accurate guidance of the wings is achieved during the opening and closing movements of the door, as well as effective sealing in the closed position, while the space requirements are minimal.

Further and favourable objects will appear from the following description.

It is already known to move the door wings in such a manner, that the outside and inside edges slide on the legs of a right angle, for the purpose of reducing the space requirements as compared with conventional type doors. It is also known still further to reduce the space requirements for the movement of the door by subdividing the door wings into two elements of equal width, which are articulated to each other, the outer panel element of the door being swung in the conventional manner about its outside edge, whereas the inside edge of the inner panel element moves in the plane the door occupies when extended or shut.

In order to achieve this movement, straight guides, or gears and chain drives are used. The straight guides have the disadvantage that the opening of the door by a full right angle requires a stretched-out position, so that, especially when the door is operated by a mechanical drive, it is not possible to fully utilise the angle of opening. The use of gearing and chains not only results in a complicated construction but also in an imperfect guidance of the door, owing to the unavoidable play of the elements of the gearing, especially of the chain. Both methods of operation have the disadvantage in common that one edge of the door slides constantly on the sealing surface of the door frame so that the packing strip, which is indispensable for perfect sealing, offers a high resistance to the movement and is, moreover, damaged within a short time and so entails frequent replacement.

According to the invention, the pivotal movement of the door wings is effected by movable straight guides which are so arranged and whose motion is controlled in such a manner that they never assume a stretched-out position nor permit the inside door edge to slide on the packing strip. In this way the disadvantages aforementioned are avoided, while the mechanism for operating the door is of simple construction.

Reference will now be had to the accompanying drawings in which Fig. 1 is a broken front elevational view of a pivoted wing door having one-part wings;

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Fig. 2 is an end elevation of Fig. 1, looking into the left side thereof;

Fig. 3 is a diagrammatical view of the one-part wing door and its action during the opening and closing movement;

Fig. 4 is a diagrammatical view of a folding or two-part wing door disclosing the movement of the parts of the door during the opening and closing thereof; and

Fig. 5 is a cross-sectional view of the guide roller assembly taken on line 5—5 of Fig. 1.

According to Fig. 3 the door wings 1 are pivotally supported in the framing in eyes 2 of levers or arms 3 which are disposed above and below the door wings 1 and are connected by pivotally supported door-post tubes 4 mounted on the framing. The bearing brackets for the guide rollers 5, which are attached outside the plane of the door and guided in the rail 6 the ends of which are mounted in the framing, are fixed to the door wings 1. The levers 7 for operating the door-post tubes 4 consist of double levers and are connected by means of sliding members 8 with the guide rail 6, when they are operated, e. g. by means of the piston of the compressed-air cylinder 9 through the double lever 10 and the rod 11, the guide rail 6 performs a pivotal or sliding movement and causes the inside edge of the door to perform the movement which is shown by dotted lines 12, whereby the door, according to the invention, is lifted from the frame packing or sealing surface 20 during the whole opening and closing operation.

Fig. 4 shows a folding-wing door according to Fig. 3, which is provided with the device according to the invention. The movement of the outer door 3*a* corresponds to that of the lever 3, that of the inner door 1*a* to that of the door wing 1 in Fig. 3. The door-post tubes 4 and the guide rollers 5 have exactly the same construction.

Separate guide rails 6*a* however, are provided for the left and right hand doors, respectively, and these guide rails are not movable in parallel but are pivoted about bearing pins 13 mounted in the framing. They are operated in this case by means of the piston of the working cylinder 9 through the double lever 10*a* and the tie link 14, which is connected direct to the left hand guide rail and through a sliding member 15 to the right hand guide rail which comprises a break-joint of the well-known type. The dotted line 12*a* again indicates the movement of the inner door-edge and shows that in this case the door is also lifted, according to the invention, from the frame packing during the whole of the opening and closing operations.

Fig. 5 illustrates by way of example an embodiment of the guide roller assembly 5 shown in Figs. 3 and 4. The assembly consists of two co-axially mounted rollers 16, 17, which have crowned peripheries of different effective diameters and roll between one side-face of the guide rail 6 and a second adjustable side face 18, the larger roller 17 in rolling contact with the fixed side face and the smaller roller with the adjustable side face as shown.

It will be appreciated that although the embodiments illustrated show constructions in which there is a door pivot at each of the two opposite vertical edges of the door opening, a wing door mounted on a single pivot at one such edge and adapted completely to seal the door opening may similarly be guided according to the invention. For instance, a pillar may be arranged centrally of the door opening in Figs. 3 and 4. Further, the door pivots may be arranged on horizontal edges of the door openings if desired.

What I claim is:

1. In a pivoted door wing construction comprising a framing, a door wing pivotally mounted within the framing, sealing surfaces associated with the framing and the door swing, a pivot post mounted in the framing, means pivotally connecting the door wing to the pivot post to cause the door to open and close when the pivot post is actuated, power operated mechanism including levers connected to the pivot post to actuate the same, a movable guide rail mounted in the framing above the door wing and parallel thereto, guide elements mounted on the door wing and engaging the guide rail to guide the door wing in its movement, a lever connected to one of the levers of the operating mechanism and to the guide rail to move the guide rail away from the door wing so as to move the door wing bodily with respect to the framing simultaneously with the initiation of the opening movement of the door wing whereby the door wing is separated from the sealing surface to prevent wear thereof.

2. A pivoted door wing as set forth in claim 1 wherein the means pivotally connecting the door wing to the pivot post comprises arms mounted above and below the door wing and also the guide rail moving lever is connected to the pivot post.

3. A pivoted door wing construction as set forth in claim 1 wherein the guide rail comprises a channel-shaped member having one adjustable side and the guide elements comprise a pair of rollers, one roller engaging one side of the channel-shaped member and the second roller of the pair engaging the other side of the channel-shaped member.

4. A pivoted door wing construction as set forth in claim 1 wherein the means pivotally connecting the door wing to the pivot post comprises an inner panel which is directly connected to the pivot post and causes movement of the outer panel upon actuation of the pivot post.

5. A pivoted door wing construction as set forth in claim 4 wherein the guide rail comprises two sections pivotally mounted in the framing at each of their outer ends and with the inner ends connected together in a pivotal breakjoint, the pivot of which is directly connected with one of the levers of the power operating mechanism.

RUDOLF KLANNER.

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