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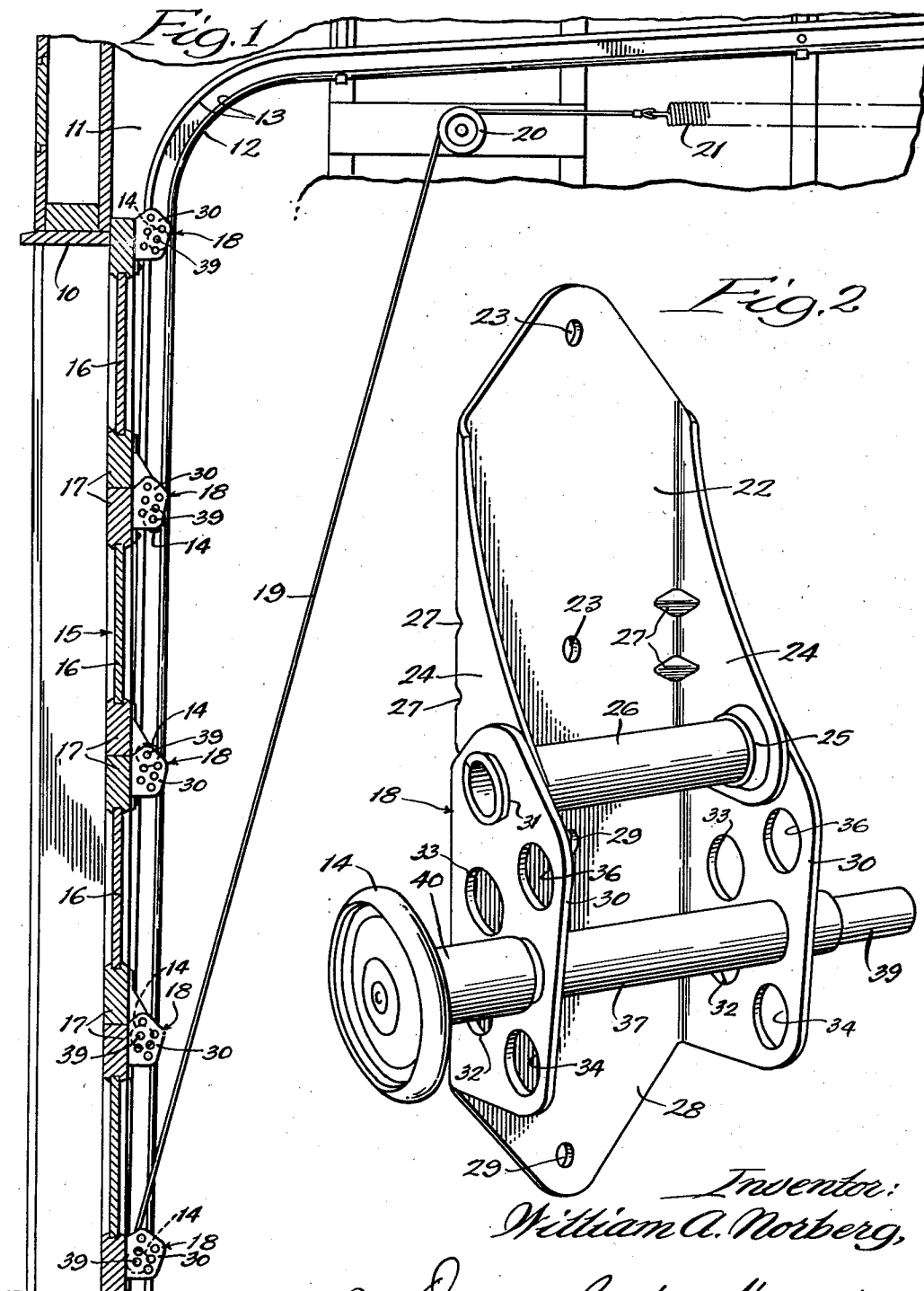
W. A. NORBERG

2,525,309

GUIDE ROLLER AND HINGE STRUCTURE

Filed Nov. 20, 1947

2 Sheets-Sheet 1



Inventor:
William A. Norberg,
By Dawson, Brith & Spangenberg,
Attorneys.

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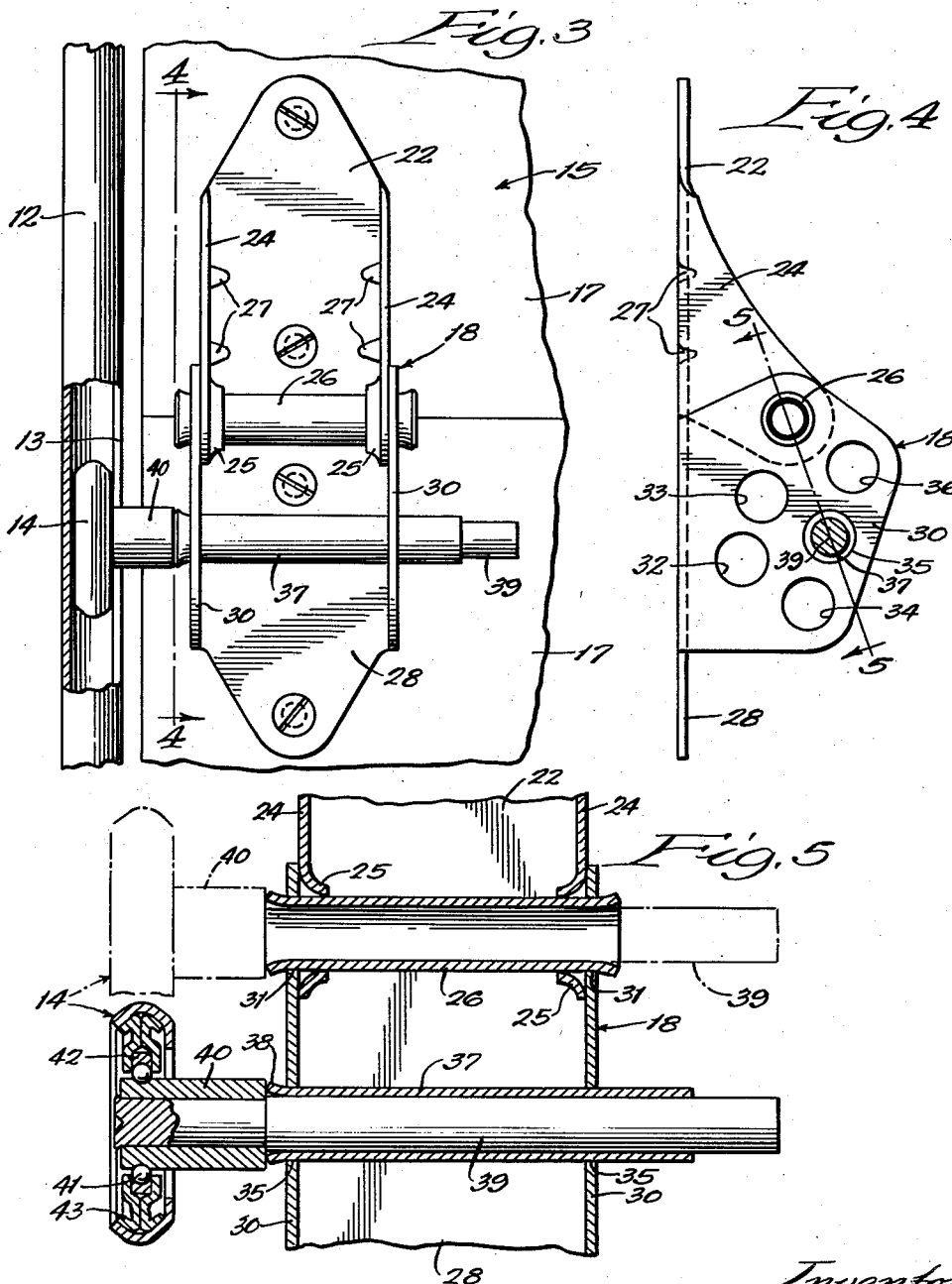
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UNITED STATES PATENT OFFICE

2,525,309

GUIDE ROLLER AND HINGE STRUCTURE

William A. Norberg, Dixon, Ill., assignor to Raynor Manufacturing Company, Dixon, Ill., a corporation of Illinois

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6 Claims. (Cl. 16—97)

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This invention relates to an overhead door structure and to hinges employed therewith. The invention is particularly applicable to doors of the panel type connected by hinges, which are employed for garages and for other types of buildings. The hinge structure is also applicable to other uses.

In an overhead door type of construction, the panels of the door, when supported in a closing position for the doorway lie substantially in a vertical plane. The guide tracks, however, for receiving the rollers carried by hinges connecting the panels, are inclined upwardly and inwardly so that there is a gradually increasing space between the tracks and the vertical door as the tracks rise. To provide for such increasing space, individual hinges have been employed for connecting the panels at different heights so as to support the roller at varying distances from the door. Such hinges are often misplaced or are not correctly brought together in a set, with the result that there is considerable loss of time in the assembly of the door structure with the tracks. Further, the structure is very expensive because the manufacturer is required to make different hinges requiring separate tools and separate operations. Further, the hinges often do not fit the requirements of the specific structure and special adjustments have to be made in order to assemble the door with the track.

An object of the present invention is to provide a panel door and hinge structure which may be readily assembled and in which a single form of hinge may be used throughout the entire height of the door. A still further object is to provide, in combination with the panels of an overhead type of door, a hinge structure permitting the shifting of the wheel-supporting shaft at varying distances laterally of the door so as to fit the door to guide tracks which may vary from normal inclinations. Yet, another object is to provide a hinge structure for supporting the panels of an overhead type of door, wherein a shiftable sleeve is supported in varying spaced positions to provide bearings for the roller-equipped shafts. A still further object is to provide a hinge structure connected by a fixed tube or sleeve adapted to receive the shaft carrying the roller and providing also spaced openings adapted to receive a removable sleeve also receiving the roller-equipped shaft. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated, in a single embodiment, by the accompanying drawings, in which—

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Figure 1 is a vertical sectional view of a structure embodying my invention; Fig. 2, a perspective view of the hinge structure employed; Fig. 3, a broken enlarged rear view showing the hinge structure applied to two door panels and supporting a roller within a guide track; Fig. 4, a vertical sectional view, the section being taken as indicated at line 4 of Fig. 3; and Fig. 5, a detail sectional view, the section being taken as indicated at line 5 of Fig. 4.

In the illustration given, 10 designates a door frame, and 11 designates the side wall of the building supporting the guide track 12. It will be understood that a similar track 12 is supported at the opposite side of the door by suitable frame supports. The track 12 is provided with the usual inwardly-turned flanges 13 for retaining the roller 14 within the track.

The segmental door in the illustration given is indicated generally by the numeral 15. The door is composed of panels 16, which may be formed in any suitable way. In the illustration given, the panels consist of a central strip received within frame border strips 17. The border strips 17 are connected by hinge structure 18.

A cable 19 connected to the lower portion of the door extends upwardly and over a pulley 20, the upper end of the cable being connected to a coil compensating spring. Since such compensating structure is well known, a detail description herein is believed unnecessary. The hinge structure 18, as shown more clearly in Figs. 2 and 5, comprises an upper section 22, having openings 23 for securing the same to a door panel and having also downwardly and inwardly turned flanges 24. The flanges 24 have openings therein with the edges thereof turned inwardly, as indicated at 25. The openings receive a fixed tube or sleeve 26 forming the pivot for the structure. If desired, the corner portions of the hinge section 22 may be pressed inwardly, as indicated at 27, to strengthen the structure.

The lower hinge section 28 is also provided with openings 29 adapted to receive screws or other means for fastening the section to a door panel. The section is provided with parallel and relatively wide flanges 30, which extend rearwardly from the main body of the section. The flanges 30 are apertured at 31 to receive the fixed pivot tube 26, as shown more clearly in Fig. 5.

In the illustration given, each of the flanges 30 is inclined rearwardly and upwardly, as shown more clearly in Fig. 4, and is provided with a number of spaced openings. An inner row of openings 32 and 33 are in diagonal alignment with the fixed pivot sleeve 26, as indicated in Fig. 4. An outer

series of openings 34, 35 and 36 are aligned so as to extend slightly outwardly of the first row of openings. The laterally spaced openings thus provided, with the exception of the openings receiving the pivot tube 26, are adapted to receive a movable sleeve or tube 36. The tube 37 has one end of normal diameter receivable within the openings 32 to 36, inclusive, while the other end of the sleeve is outwardly flared, as indicated by the numeral 38.

Received within the sleeve 37 is a shaft 39 supporting a fixed collar 40, as indicated more clearly in Fig. 5. The collar 40 is provided with a groove adapted to receive the ball bearings 41 and upon the race 42 about the ball bearings is mounted a roller structure 43. Thus, the roller structure 43 is free to rotate about the ball bearings 41 but is fixed with respect to longitudinal movement upon the collar 40 of the shaft 39.

The shaft 39 is also adapted to be received within the fixed tube 26, as indicated in dotted lines in Fig. 5, so that the roller-bearing shaft 39 may be moved successively into the sleeve 37 carried by openings 32, 33, 34, 35 and 36, and may also be introduced into the fixed tube 26.

In the assembly of the door with respect to the inclined track 12, it will be noted that the hinges 18 may all be alike and that the only adjustment therein is in the positioning of the tube 37. For the lower hinges, the tube 37 will be placed within the inner openings 32 or 33, while as the hinges are left at higher elevations, the sleeve 37 is moved to the outer groove of openings. Thus, the roller 14 is supported at varying distances rearwardly of the door so as to support it in alignment with the guideway 12 at the different elevations.

Should there be slight irregularities in the inclination of the track caused by irregularities of the main structure, the hinge flanges illustrated provide means for varying the outward positioning of the rollers to fit such irregularities. Further, if a need for adjustment should later occur for any reason, the sleeve 37 may be readily removed from the aligned openings receiving the same and inserted into another pair of openings which place the roller in the desired alignment with the track.

While I prefer to flare the end of the tube 37 on one side, it will be understood that any suitable enlargement may be provided which will serve to lock the tube against lateral movement.

The relatively wide flanges on both of the hinge sections provide a support for the pivot 26 at a point well to the rear of the front panels of the hinge. Further, by using the fixed tube 26 as the pivot tube and for receiving the roller-equipped shaft, such tube becomes an optional bearing for the shaft in a graduated alignment or spacing from the other openings which receive the removable tube or sleeve 37. The wide flanges of the structure extend outwardly past guide track 12 and protect the openings between the flanges 13, while at the same time providing laterally-spaced openings for receiving the removable sleeve 37.

The structure is extremely simple, permits the assembly of the door with facility and without requiring specific types of hinges for different elevations, while at the same time permitting any selected variation in the angle between the door and the inclined track or guideway.

While in the foregoing specification I have set forth one embodiment of the invention in great detail for the purpose of illustration, it will be understood that the details of such structure may

be varied widely by those skilled in the art without departing from the spirit of my invention.

I claim:

1. In a hinge structure having a pair of hinge sections pivotally connected together; one of said sections being provided with parallel flanges in spaced relation and provided with aligned pairs of laterally spaced openings, a sleeve selectively received in any of said aligned pairs of openings, and a roller-equipped shaft supported in said sleeve.

2. In a hinge structure having a pair of hinge sections pivotally connected together; one of said sections being provided with parallel flanges in spaced relation and provided with aligned pairs of laterally spaced openings, a sleeve selectively received in any of said aligned pairs of openings, and a roller-equipped shaft supported in said sleeve, said sleeve having its inner end adjacent to said roller enlarged.

3. In a hinge structure having a pair of hinge plate sections pivotally connected together at one end; one of said hinge sections having a pair of spaced parallel flanges provided with aligned pairs of laterally spaced openings, a sleeve member interchangeably received within said pairs of openings, and a roller carrying shaft supported in said sleeve.

4. In a hinge structure, a pair of hinge plate sections each provided with rearwardly extending flanges, a tubular member extending through the flanges of said sections to pivotally secure them together, the flanges of one of said hinge sections being provided with aligned pairs of laterally spaced openings, a movable tubular member interchangeably received within one of said pairs of said laterally spaced openings, and a roller-equipped shaft selectively supported in one of said tubular members.

5. In a hinge structure, a pair of hinge plate sections each provided with rearwardly extending flanges, the flanges of one plate section partially overlapping the flanges of the other plate section, a tubular member extending through said overlapping flange portions to pivotally secure the hinge sections together, one of said sections having its rearwardly extending flanges provided with spaced pairs of openings, the openings being arranged in inclined rows, a tubular member interchangeably received within said pairs of openings, and a roller-equipped shaft selectively supported in said tubular members.

6. In a hinge structure, a pair of hinge sections equipped with rearwardly extending flanges in partially overlapping relation, a fixed tube connecting said overlapping flange portions for pivotally securing together said hinge sections, the flanges of one of said hinge sections being provided with aligned pairs of openings and the openings being arranged in inclined rows in each flange, a removable tube interchangeably received within said openings, and a roller carrying shaft selectively supported within said tubes.

WILLIAM A. NORBERG.

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