Oct. 8, 1957 C. M. WILKINSON 2,808,625

CHUTE CONSTRUCTION

Filed March 2, 1954 3 Sheets-Sheet 1

FIG. 1

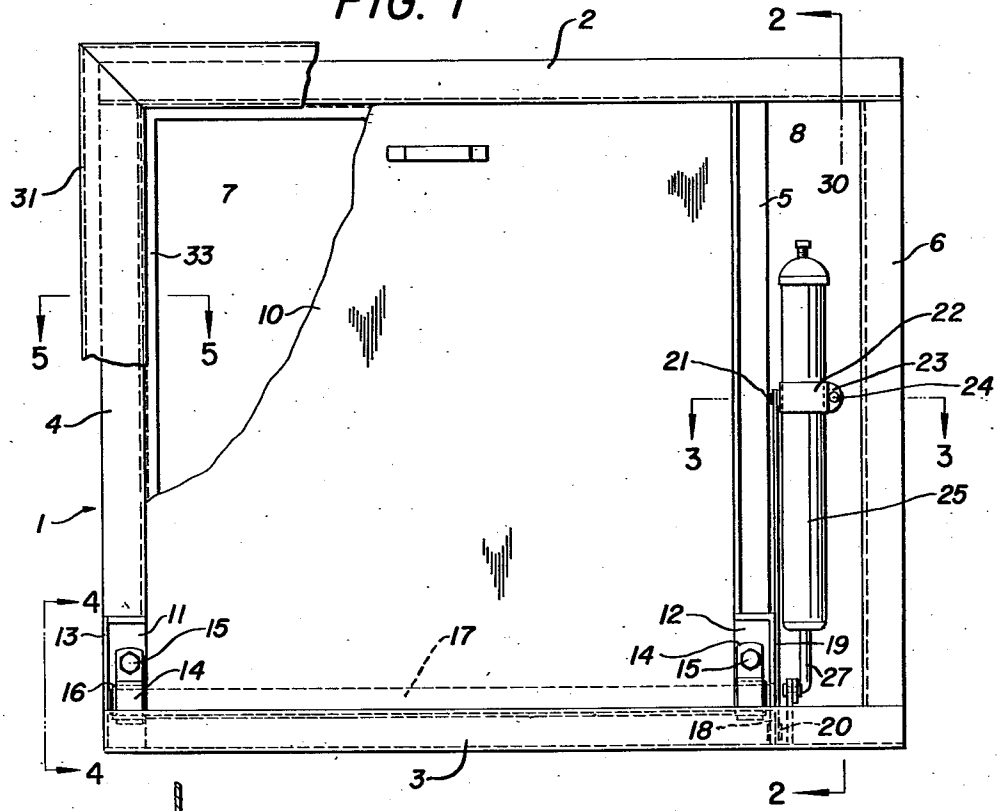


FIG. 2

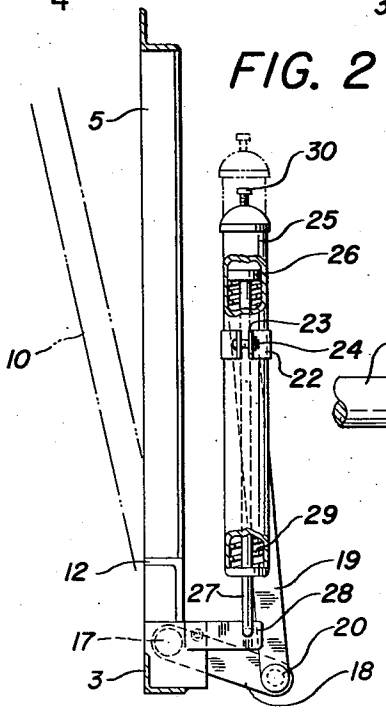
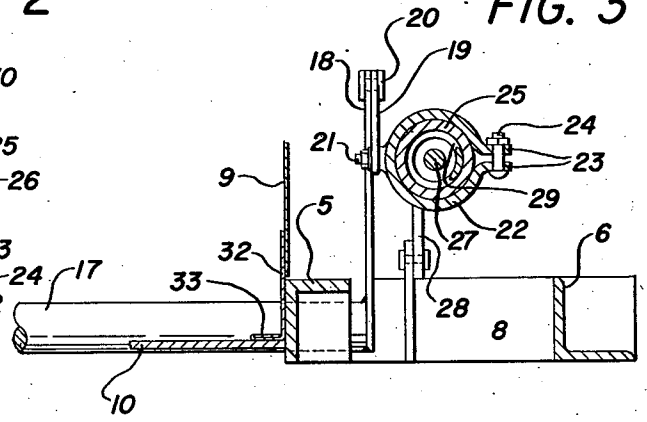


FIG. 3



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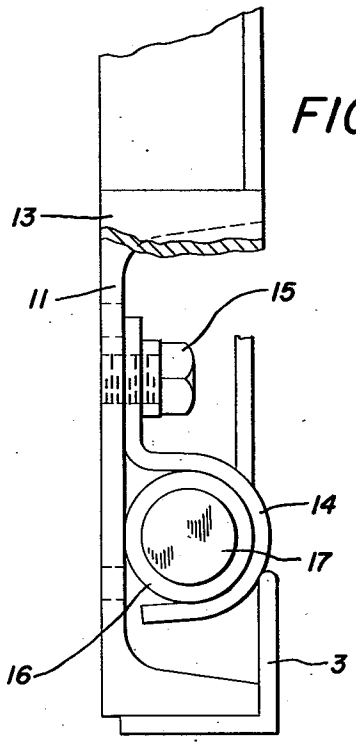


FIG. 4

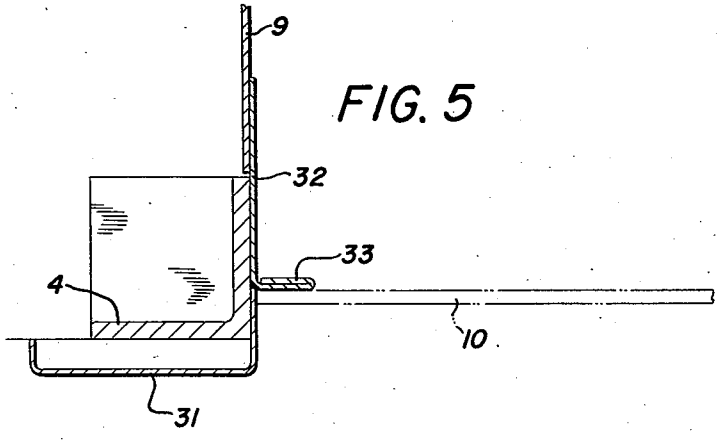


FIG. 5

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CHUTE CONSTRUCTION

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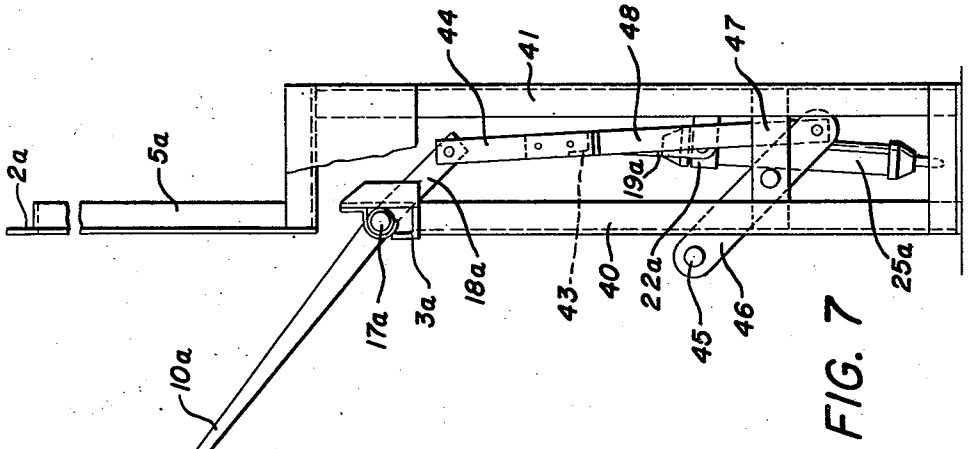


FIG. 7

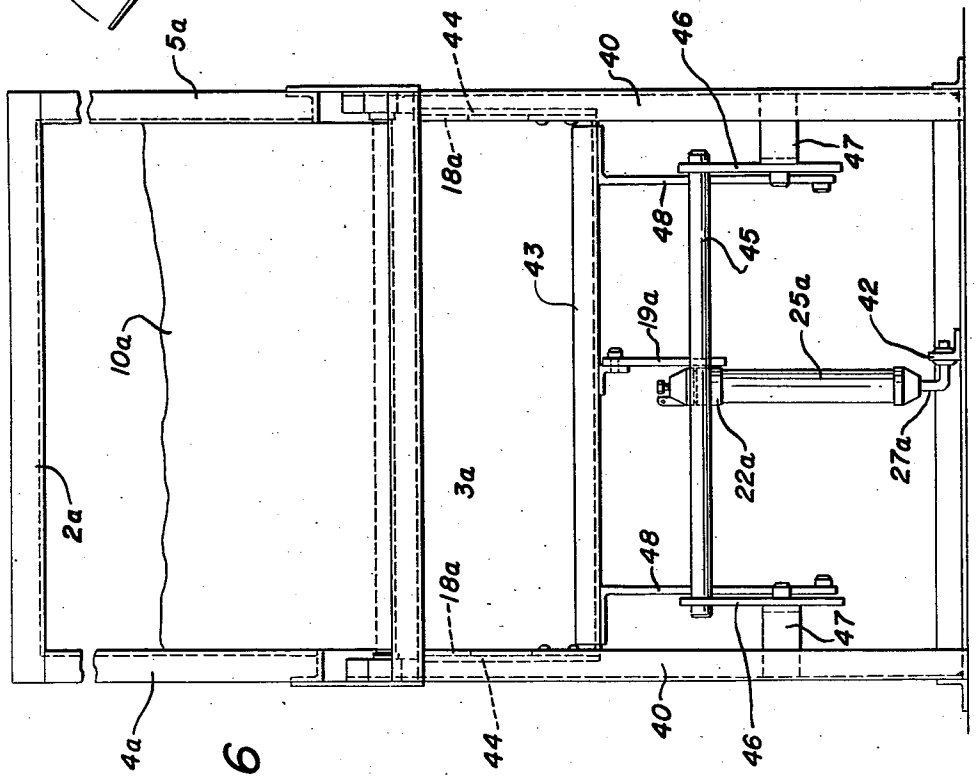


FIG. 6

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2,808,625

CHUTE CONSTRUCTION

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Application March 2, 1954, Serial No. 413,604

7 Claims. (Cl. 20—16)

This invention relates to improvements in laundry chutes, garbage chutes, rubbish chutes or the like, and particularly relates to a novel type of frame and door means for such chutes together with means for controlling the opening and closing action of the door in a readily adjustable manner.

Heretofore various types of chutes have been provided and many different types of door opening and closing mechanisms have likewise been designed. Some of such chutes and closures have been commercially produced but generally the chutes are difficult to service after once installed. The present type of a chute is similar to that disclosed in and covered by my previous United States Letters Patent Number 2,587,021 issued February 26, 1952. In chutes of this type, it frequently is necessary to be able to repair or adjust the door and its action as the bearings for the door may have to be replaced relatively frequently or other repair or maintanence action may be required thereon. Hence it is very desirable that the door be easily removable to permit access to the door frame and associated means, and, specifically, to permit a convenient, easy change of the bearing means used on the door without disturbing the door frame. Furthermore, in different chute constructions, it is desirable in some instances that the door only open a small amount such as 30 to 45 degrees whereas in other installations it may be desirable to open the chute door as much as 60 to 90 degrees so that a universal adjustable control for the chute door to regulate its action would simplify the number of styles of chutes which would be produced.

The general object of the present invention is to provide a new and improved type of a chute construction and door and frame means characterized by the accessibility of the components thereof.

Another object of the invention is to provide a chute construction wherein the bearing means positioning a door or closure member in the chute are readily available for repair or replacement, or for removal of the door, as desired without disturbing the door frame in any manner.

Another object of the invention is to provide door check and closure means in a laundry chute wherein such door check and closure means can be connected to the remainder of the mechanism in an easily adjustable manner to provide any desired maximum door opening angle.

Yet another object of the invention is to secure door check means in a chute construction so that the forces set up thereby can be easily varied and controlled and a positive self-closing action can be obtained from an open or a partly closed position.

Another object of the invention is to provide a noiseless automatic door closure which returns a door to latched position.

The foregoing and other objects and advantages of the invention will be made more apparent as the specification proceeds.

In order to understand the details of the invention more clearly, reference should be had to the accompanying

drawings wherein one currently preferred embodiment of the principles of the invention is shown, and wherein:

Fig. 1 is a front elevation of the chute construction of the invention with parts thereof broken away for clarity;

Fig. 2 is a vertical section taken on line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary horizontal section taken on line 3—3 of Fig. 1;

Fig. 4 is an enlarged elevation taken on line 4—4 of Fig. 1 with the trim strip removed to show details of the frame means of the invention;

Fig. 5 is an enlarged section on line 5—5 of Fig. 1;

Fig. 6 is an elevation of a modification of the chute structure of the invention with cover panels removed and parts broken away for clarity; and

Fig. 7 is a side elevation of the apparatus of Fig. 6.

In referring to corresponding parts in the drawings and the specification, corresponding numerals are used to facilitate comparison between such similar parts in the drawings and specification.

The invention relates to a rubbish, garbage, or laundry chute, or the like wherein a quadrilateral frame having a center opening therein is provided, a door is present in the apparatus, and means pivotally secure the door to the frame for covering the frame center opening, which means include readily accessible, exposed bearing means for journalling the door on the frame. The chute also has a return cylinder with a control piston therein, while adjustable link means secure the return cylinder to the door to move the cylinder a variable distance corresponding to movement of the door, and means secure the control piston to the frame to provide relative movement between the piston and return cylinder on movement of the door.

Particular attention now is directed to the details of the structure shown in the accompanying drawings, and chute closure and associated means is shown and is indicated as a whole by the numeral **1**. This chute closure **1** includes a frame formed from an upper or top angle **2**, a bottom angle **3** and side angles **4** and **5** with the frame being completed by an edge angle **6**. The various components of the frame of the chute closure usually provide a quadrilateral frame having a center opening **7** therein and an edge or auxiliary opening **8**. The center opening **7** connects to a chute throat **9** formed from metal sheet or other similar means, and extending rearwardly and downwardly from the chute closure.

As an important feature of the invention, a door **10** is provided to cover the center opening **7** in the chute closure and this door is pivotally secured in an easily removable manner to forwardly open, transversely extending channels **11** and **12** provided at and suitably secured to the lower portion of the side angles **4** and **5** of the chute frame. These channels **11** and **12** may have reinforcing edge flanges **13** thereon. The channels **11** and **12** are provided for engaging or receiving bearing straps or clamps **14** of substantially C-shape in section, with such bearing straps or clamps **14** being removably secured to the channels by cap screws **15**, or similar members the straps **14** position bearings **16** therein that journal a shaft **17** secured to and protruding laterally from the door **10**.

Another important feature of the present invention resides in the means for returning the door **10** to its closed position after being opened. These closure means include a control lever **18** welded, or otherwise secured to the shaft **17** adjacent the side angle **5** for arcuate movement with opening or closing movement of the door **10**. Such control lever **18** is pivotally secured to a link **19** by a rivet or similar member **20**. This link **19**, as best shown in Figs. 1 through 3 of the drawings, is pivotally

secured at its other end to a stud **21** which itself is welded, or otherwise secured to a clamp strap **22**. This strap **22** has ears **23** thereon for engaging a bolt **24** used for drawing the ears **23** towards each other to clamp the strap **22** tightly about any desired section of a return, or control cylinder **25** provided in the apparatus of the invention. Thus the control lever **18** is secured to the control cylinder **25** in an adjustable manner for purposes hereinafter described in more detail. The control cylinder **25** receives a control piston **26** therein and piston rod **27** is secured to such piston **26** and extends from the cylinder **25**. Such piston rod **27** is pivotally secured to the frame means of the invention, for example by means of an anchor plate or bracket **28** fixedly secured to the bottom angle **3** of the frame. Hence on opening movement or closing movement of the door **10**, relative movement is produced between the piston **26** and control cylinder **25**. A return spring **29** is positioned in one end of the control cylinder **25** for compression upon opening the door **10** and release of the door provides an automatic closure of the door **10** if a suitable strength return spring is initially provided in the control cylinder **25**. Preferably the control cylinder **25** also is of the controlled air check type so that a control screw or stud **30**, as indicated, is present on the end of the cylinder remote from the return spring **29**. Adjustment of this control screw **30** aids in regulating the action of the control cylinder **25** by the rate of exhaust or passage of air into and from the control cylinder **25**.

The chute closure **1** is finished by edge and top trim strips **31** suitably removably secured to the angle or frame means of the chute. Suitable cover strips **32** are provided in the chute assembly and bridge over between the chute throat **9** and adjacent portions of the frame of the laundry chute closure. This construction is best illustrated in Fig. 5 of the drawings and these cover strips **32** provide stop flanges **33** at the forward margins thereof against which the door **10** is adapted to abut when closed. The stop flanges **33** protrude laterally inwardly into the center opening of the frame for convenient engagement with the door **10**. The cover strips **32** may be welded or otherwise suitably secured to the top angle **2** and side angles **4** and **5** by which they are positioned so that a tight but neat closure is provided connecting the frame of the chute closure to the chute throat or other member.

From the foregoing, it will be seen that the closure action provided for the door **10** can be regulated since the engagement between the clamp strap **22** and the control cylinder **25** can readily be varied to change the throw or movement produced between the piston and control cylinder for regulating and adjusting the return or closure action on the door **10**. Of course, the control piston **26** could be adjustably secured to the door and the control cylinder **25** could be pivotally secured to the closure or chute frame, if desired, so that a reversal of the positioning of the parts illustrated may be provided. It also should be noted that it may be desired to make the link **19**, for example, or the control lever **18** adjustable in length to provide the desired control for the door **10**.

It also will be realized that the bearing means used for supporting the door **10** are positioned in a convenient, exposed manner so that the removal of the door and replacement of the positioning bearings for the door can be easily effected, when desired.

Obviously any suitable removable closure can be provided over the auxiliary or side opening **8** provided in the laundry chute **1** of the invention. By removal of the trim strips or cover panel over the side frame opening **8**, the chute closure parts are available for repair or servicing.

Figs. 6 and 7 show that the controls for a chute door may be placed other than at the side of the door. Hence a frame is shown and has a top angle **2***a* and side angles **4***a* and **5***a*. A bottom angle **3***a* completes the definition of a chute opening over which a door **10***a* is positioned. The frame also has front support legs **40** and rear support legs **41** extending downwardly from the door **10***a* and door opening. The door **10***a* is carried by a shaft **17***a* positioned in the frame as in the embodiment of the invention of Figs. 1 through 5. This shaft **17***a* has a control link **18***a* secured thereto and extending downwardly therefrom from each end of the shaft.

As a feature of the invention, a control cylinder **25***a* is partly positioned by an angle **42**, or other anchor member which is shown forming part of a bottom frame secured to the legs **40** and **41**. Piston rod **27***a* of the control cylinder **25***a* is secured to the angle **42** while the cylinder **25***a* is adjustably secured to a control link **19***a* through a releasable strap **22***a* and similar connection means as described hereinbefore. The control link **19***a* is pivotally carried on a cross bar **43** extending transversely of the apparatus and located intermediate the front and rear support legs **40** and **41**. Connector bars **44** extend between and connect the cross bar **43** pivotally to the control links **18***a* whereby opening the door **10***a* will move the control cylinder **25***a* to set up forces therein to close the door automatically, if desired.

As another special part of the apparatus, a foot operated control bar **45** extends transversely of the apparatus in front of the support legs **40**. The control bar **45** is carried by levers **46** fulcrumed on brackets **47** carried by the support legs **40** and **41**. The levers **46** pivotally connect to bars **48** solidly secured to the cross bar **43** so that the control bar **45** can be used as a foot operated control for opening the door **10***a*. Of course, the control bar **45** and associated means can be omitted if no foot control for the door is desired.

It should be noted that the control cylinder **25***a* can extend upwardly from the cross bar **43** and be partially positioned, for example, by the bottom angle **3***a* to provide a more compact control.

By use of connector means having an enclosed linked section engaging pulley means for transmitting forces along the axis of the connector, for example, **22***a*, the cylinder **25***a* can extend transversely of the apparatus.

For clarity, cover panels and trim strips as would be used with the frame of Figs. 6 and 7 have been removed. The door bearing means for this frame are as shown in Figs. 1 to 5.

Preferably some positive latch means (not shown) are provided to aid in holding a chute door closed after it has been so positioned by the closure means of the invention.

From the foregoing, it will be seen that the objects of the invention have been achieved and that an attractive accessible chute closure construction has been provided by the invention.

While two complete embodiments of the invention have been disclosed herein, it will be appreciated that modification of these particular embodiments of the invention may be resorted to without departing from the scope of the invention as defined in the appended claims.

What I claim is:

1. In a laundry or garbage chute or the like, a quadrilateral frame having a center opening therein, a door, means pivotally securing said door to said frame for covering the opening therein, a return cylinder having a control piston therein, means adjustably securing said return cylinder to said door to move such cylinder a controllable distance corresponding to movement of said door, and means securing said piston to said frame for pivotal movement only to provide relative movement of said piston and return cylinder on movement of said door.

2. In a chute mechanism, frame means having an open portion, a door having a shaft journalled on said frame means for closing said open portion, said frame means

having an auxiliary side opening therein, a return cylinder having a spring and piston positioned therein and a piston rod secured to the piston and extending from the cylinder, means pivotally securing said piston rod to said frame at the auxiliary side opening therein, link means secured to said door shaft, and means securing said link means to said cylinder to vary the movement of said cylinder on opening said door and including a clamp and bolt member adjustably engaging said cylinder for changing the action of said return cylinder.

3. In a chute mechanism, an open center frame, a door for closing the open center of said frame, a shaft for pivotally securing said door to said frame, said frame including top and side angle means and forwardly open transversely extending channels at the lower lateral edges of said side angle means, said channels being secured to and being in alignment with said side angle means, and support bearing means on and removably securing said shaft to the front surface of and substantially within said channels whereby said bearing means are readily available for removal thereof to permit removal and repair of said door.

4. In a chute mechanism, an open center frame primarily formed from metal angles and having opposed recessed portions therein, a door for closing the open center of said frame, a shaft for pivotally securing said door to said frame, cover strips secured to and extending over portions of the inner surfaces of said angles and having door stop flanges thereon on the sides and top of said frame said cover strips protruding axially inwardly from the inner surfaces of said angles, and bearing means removably securing said shaft to the recessed portions of said frame.

5. In a chute closure, a frame having an opening therein, a door for closing the opening of the frame, a shaft engaging the door and extending laterally therefrom, a control link secured to said shaft at each end thereof and extending rigidly therefrom, a control cylinder and piston member positioned intermediate the lateral margins of said door, means securing one part of said member to said frame, link means pivotally connected to said control links and extending downwardly therefrom on each side of said door, a cross bar secured to and extending between said link means, and means adjustably

connecting said cross bar to said member for relative movement of said piston and cylinder on movement of said door.

6. In a chute closure, a frame having an opening therein, a door for closing the opening of the frame, a shaft engaging the door and extending laterally therefrom, a control link secured to said shaft at each end thereof and extending rigidly therefrom, a control cylinder and piston member positioned intermediate the lateral margins of said door, means securing one part of said member to said frame, link means pivotally connected to said control links and extending downwardly therefrom on each side of said door, a cross bar secured to and extending between said link means, treadle means pivotally connected to said cross bar at laterally spaced portions thereof for moving it vertically, and means pivotally connecting said control cylinder and piston member to said cross bar for return movement of said door and treadle when after being depressed to open said door.

7. In a chute mechanism, an open center planar frame, a door for closing the open center of said frame, a shaft for pivotally securing said door to said fame, said frame including forwardly open means forming a part thereof and lying in the plane of said frame, the ends of said shaft extending into said forwardly open means, bearings engaging said shaft ends, and support clamps removably secured to said forwardly open means and positioning said bearings and shaft ends within said forwardly open means whereby said bearings are readily available for removal thereof and whereby planar cover means can readily be positioned over said frame and bearing assembly.

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