Dec. 4, 1962

F. J. J. TRAPMAN

3,066,348

DOOR CLOSER

Filed March 18, 1960

2 Sheets-Sheet 1

Fig. 1

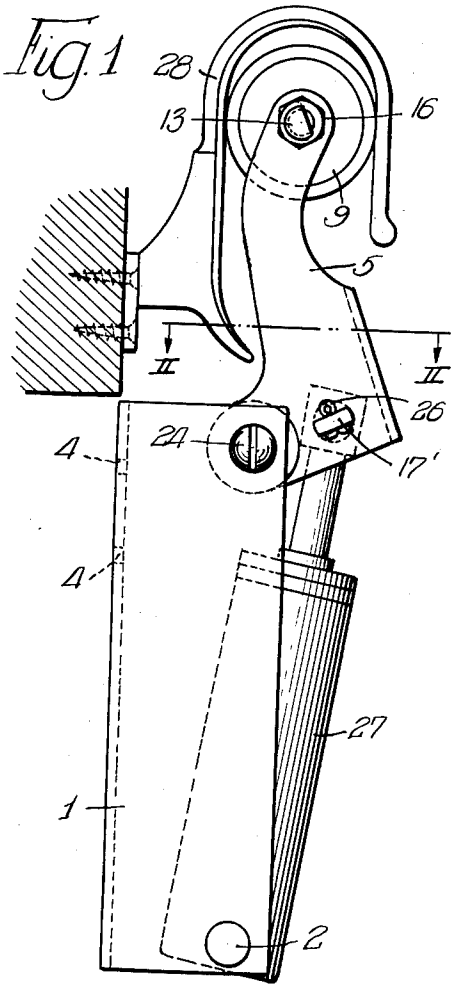
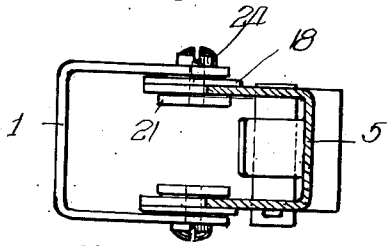


Fig. 2



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Fig. 3



Fig. 4

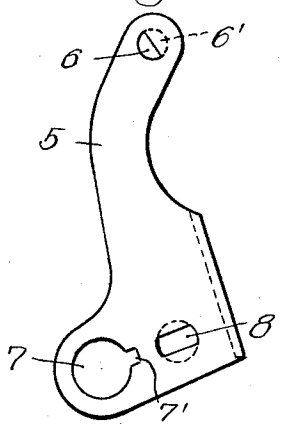


Fig. 5

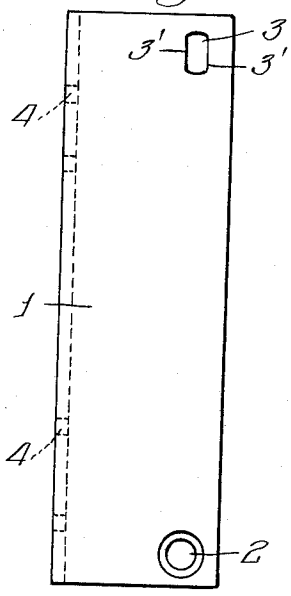


Fig. 6



Fig. 7

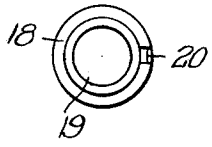


Fig. 8

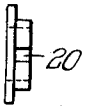


Fig. 9

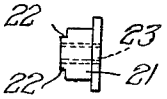


Fig. 10

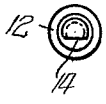


Fig. 11

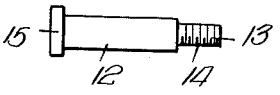


Fig. 12



Fig. 13

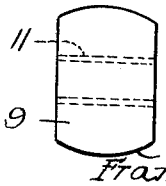
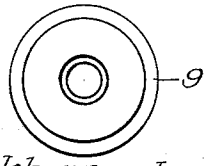


Fig. 14



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DOOR CLOSER

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2 Claims. (Cl. 16—57)

The invention relates to a door closer consisting of a U-shaped frame and a lever both manufactured in thin stamped metal-sheet and rotatably mounted with respect to each other and provided with a buffer which on one side is pivoted to the frame and on the other side to the lever, whereas at the end of the lever a rubber roller is pivoted in a bearing.

Door closers of this kind have generally well satisfied in practice. However they have the disadvantage that as the shafts are bearing in the relatively thin sheet iron of the frame and the lever, the holes after a short use show a great play so that the frame and the lever must be renewed and thus the whole door closer must be replaced by a new one. Therefore the known door closers are not economical.

It is the main object of the present invention to abolish this disadvantage by fixing all rotating shafts or bearings with respect to the frame and the lever so that these members which are submitted to wear can easily and at low cost be replaced by new spares.

Beside the cited advantage the invention offers still another advantage. The roller of the door closer is provided with a spherical tread by which measure the wear compared with the known door closer is also reduced. Further advantages of the door closer according to the invention will appear from the following description in which on the basis of the drawings a form of embodiment of the door closer according to the invention will be explained; in the drawings are:

FIG. 1 a side view of the complete door closer;
FIG. 2 a cross-section along the line II—II of FIG. 1;
FIG. 3 a side view of the upper rotary shaft of the buffer;
FIG. 4 a side view of the lever;
FIG. 5 a side view of the frame;
FIG. 6 a side view of the screw for fixing one bearing of the lever to the frame;
FIG. 7 a front view of a bronze ring for one bearing of the lever in the frame;
FIG. 8 a side view of the ring of FIG. 7;
FIG. 9 a side view of the hollow shaft fitting in the ring of FIG. 7;
FIG. 10 an end view of the shaft for the rubber roller;
FIG. 11 a side view of the shaft of FIG. 10;
FIG. 12 a side view of nut for the shaft of FIGS. 10 and 11;
FIG. 13 a front view of the roller; and
FIG. 14 a side view of the roller.

The known door closer which is shown in FIG. 1 consists of a U-shaped frame **1** for mounting the door closer on the doorpost. On this frame **1** are rotatably mounted the lower bearing of the buffer **27** and the bearing **24** of the lever **5**. At the upper end the buffer **27** is pivoted at **3** in the lever **5**. The rubber roller **9** is pivoted on the shaft **17** fixed in the upper end of the lever **5**. The roller **9** runs on the hook **28**. The inner parts of the buffer **27** such as the spring loaded piston and the inner end of its piston-rod are not shown, for these parts do not belong to the present invention.

In the known door closer the cited shafts rotate in the rather thin iron sheet of the frame and the lever. The wear on those places is so strong that after a relatively short time of use these members, and therefore practically the whole door closer, has to be renewed. In the

door closer according to the invention all bearings or rotating shafts in which the rotation-angle is large are fixed with respect to the frame or the lever so that the wear in these parts is completely abolished.

FIG. 5 shows a side view of the frame **1**, the bores **4** are destined for the connecting screws on the doorpost. Bore **2** is destined for a tap of the lower bearing of buffer **27**. The rotation angle being small no special measures are necessary for those bearings.

The most important bearings are the bearings **3** of the lever **5** in the frame **1** (see FIGS. 1, 2, 4, 6, 7, 8, and 9). In the opening **7** of the lever **5** the ring **19** consisting of sintered bronze powder is placed. The flange **18** of the ring lies between an inner face of the frame **1** and an outer face of the lever **5**, and with the cam **20** of ring **19** fitting in the slot **7'** of lever **5** to fix the ring to the lever for rotation therewith. Through the center opening of the ring **19** (see FIGS. 7 and 9) the hollow shaft **21** is passed which at the inner side rests with a collar against the ring **19**. On the other side the shaft **21** is provided with two flat parts **22** with which the shaft **21** rests against the flat sides **3'** of the hole **3**. The shaft **21** is provided with a threaded bore **23** through which the screw **24** is passed which is fixed by means of a washer on the screw **24**. Thus in practice the bronze ring **19** is fixed in the lever **5** to turn on the shaft **21**, which is fixed in one side of the frame **1**. When these bearings are worn out only the rings **19** and the shafts **21** have to be renewed.

The shaft **17** for the upper bearing of the piston rod is provided at one side with flattened parts **17'** fitting in a corresponding hole **8** of the lever **5** (see FIG. 4); through these flattened parts a bore has been provided for the passing of a split pin **26** (see FIG. 1). As in this manner the shaft **17** is fixed with regard to the lever **5** no wear can occur in the lever on this place.

The rubber roller **9** with its mounting parts are shown in FIGS. 1, 4, 10, 11, 12, 13, and 14. The rubber roller **9** is provided with a central sleeve **11** turning on the shaft **12**. This shaft **12** is fixed in the lever **5** in the following manner: At one side the shaft **12** is provided with a collar **15** and at the other side with a smaller threaded part **13** with a flattening **14** resting against the flattening **6'** of the hole **6**. After the shaft **12** has been passed through the circular hole at one side of the lever **5**, the sleeve of the rubber roller **9** and the hole **6** with the flattening **6'** the position of this shaft is fixed by the nut **16**.

According to the invention the rubber roller **9** is provided with a spherical tread **10** so that during the closing of the door the roller always fits without play between the legs of the hook **28**.

What I claim is:

1. In a door closer consisting of a U-shaped frame and a lever, both stamped from relatively thin sheet metal stock and pivotally mounted with respect to each other, a buffer connected at one end to the frame and at its other end to one end of the lever, a rubber roller carried by the other end of the lever, and bearing means for said lever comprising a hole in the frame having flattened sides, a flanged ring of sintered bronze powder, said lever having a hole and a slot therein for receiving said flanged ring, a cam on said ring adapted to be received in the slot in the lever, the flange of the ring being disposed between one leg of the U-shaped frame and the lever, a shaft having a threaded bore adapted for reception in said flanged ring, said shaft having flattened portions at one end for engagement with the flattened sides of the hole in said frame, a fastening screw threaded into the bore of said shaft, and a washer carried by said screw to prevent loosening of the latter.

2. A door closer as defined in claim 1, wherein the roller is provided with a shaft having a flat side and being threaded at one end and provided with a thickened head at its opposite end, and wherein the lever is provided with a hole having a flat side, the hole receiving the shaft with the flat side of the latter in cooperating engagement with the flat side of the hole, whereby to resist rotation of the shaft with respect to the lever, and a nut turned on to the threaded portion of said shaft to secure the latter to said lever.

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