Nov. 15, 1966 L. BOYAR 3,285,634

MEANS FOR THE REPAIR OF HAND-OPERATED VENT REGULATOR ASSEMBLIES

Filed May 15, 1964

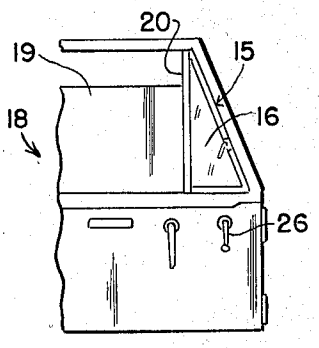


FIG. 1

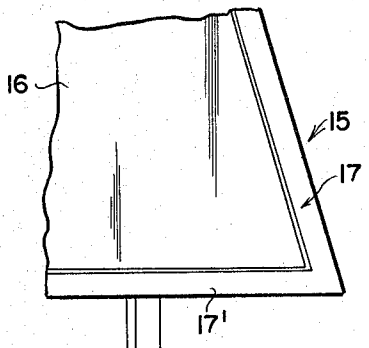
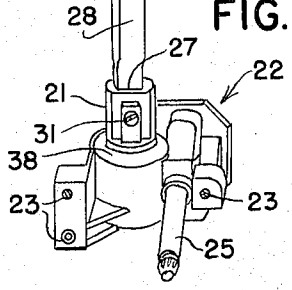


FIG. 2



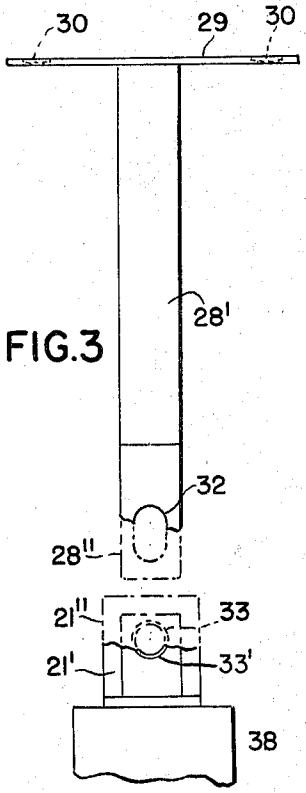


FIG. 3

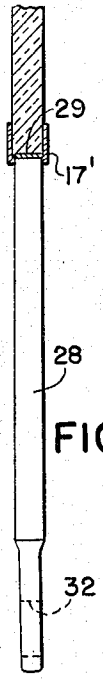


FIG. 4

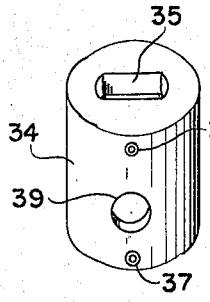


FIG. 6

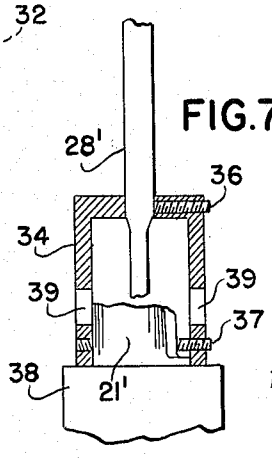


FIG. 7

FIG. 5

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MEANS FOR THE REPAIR OF HAND-OPERATED VENT REGULATOR ASSEMBLIES

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1 Claim. (Cl. 287—108)

The present invention relates to the repair of hand-operated vent regulator assemblies carried on the doors of automobiles.

A vent is an independent window section of generally upright triangular shape, in most modern automobiles. Its pane is usually in a dihedral frame one of whose legs is along the bottom edge; said leg having a downward extending flat shank which fits into a socket in the upper end of an upright capstan of a mechanism housed with the hollow of the door structure. A horizontal shaft extends from said mechanism, through the wall of the door structure into the automobile's interior where it has a crank handle. Said mechanism includes means as for instance a worm and wheel to make the capstan turn when said crank handle is turned, thereby opening and closing the vent. Of course, there is a stop to limit the frame movement when the vent is closed and usually a latch is provided to hold the vent closed.

An appreciable force is necessary to operate such vent regulator assembly, so too often when the crank handle is turned to tightly close the vent or accidently turned in the wrong direction when it is desired to open the vent, the shank, the capstan or both of them are broken. If both break, as is often the case, the broken shank has to be removed from the frame and a new one mounted thereon and all the regulator had to be discarded and replaced with a new one. The regulator being a die casting, is sure to be one of the broken parts, and so had to be replaced. It is evident that the cost, labor and time for this is considerable.

It is therefore the principal object of this invention to provide a novel and simple manner which makes it easy to restore the operation of a broken vent regulator assembly in a minimum of time, at a minimum of expense and efficiently.

Other objects and advantages will become apparent as this disclosure proceeds.

Usually, the shank would be broken across a slot therein which has a set screw therethrough threadedly engaged in the capstan's body and the break in the capstan would also be in that region. So for one practice of this invention when a vent regulator assembly breaks, is to gain access thereto, remove the screws mounting the regulator mechanism so it can be lowered to make room to set a cap onto the stub remaining of the capstan after the broken off parts are removed. The mechanism with said cap on, is then raised so the bottom of the shank shall enter a slot in the floor wall of the cap. The regulator is then remounted. Set screws threaded through the peripheral wall of said cap are used to secure the shank and capstan to said cap. If desired, a whole or a pair of diametrically opposite holes may be provided through the peripheral wall of the cap to admit a set screw or pass a bolt, as will be explained. These caps are relatively tall, to accept a broken shank which is short.

In the accompanying drawing forming part of this specification, similar characters of reference indicate corresponding parts in all the views.

FIG. 1 is a fragmentary view showing an automobile door as seen from inside the vehicle. This door is equipped with a vent and its body is of hollow construction wherein is mounted a vent regulator assembly which is operated by a crank handle.

FIG. 2 is a fragmentary enlarged perspective view showing the vent and its associated regulator presenting a shaft which is to carry the crank handle.

FIG. 3 is an elevational enlarged view of the shank after it has been broken; the broken away part being shown by a dash-dot line. Also shown is the means to fix to frame.

FIG. 4 is a side view of FIG. 3. Here, the shank is shown whole, fixed to the frame holding the pane.

FIG. 5 is a fragmentary elevational view showing the broken capstan and its associated mount which also serves to hold mechanism (not shown) which will cause the capstan to turn when the crank handle is turned.

FIG. 6 is a perspective view of the cap.

FIG. 7 is a sectional view showing the cap associating the broken shank with the broken capstan in accordance with this invention.

FIGS. 3–7 are drawn to the same scale.

In the drawing, the numeral **15** designates a vent comprising a glass pane **16** held in a frame **17** made of channel stock. This vent is carried on an automobile door **18** next to the main window offered by a vertically movable pane **19** riding in fixed vertical channel tracks, one of which is indicated at **20**. Said vent is arranged for rotary movement about a vertical axis, offered by an upright capstan **21** which is part of the regulator mechanism designated generally by the numeral **22**, housed within the hollow of the door **18**; the same being mounted on suitable framework (not shown) on the interior of said door structure by bolts through the threaded holes **23**. The body of the mechanism **22** to which the capstan is journalled, also houses suitable mechanism, as for instance a worm on the shaft **25**, in engagement with a wheel turning with the capstan, so that upon turning said shaft by a crank handle **26** thereon, said capstan will turn. Said worm and wheel are not shown. Said capstan has a non-circular socket **27** into which slidingly fits or loosely fits the lower end of the shank **28** made of flat stock. Said shank is through a suitable hole in the frame leg **17'**; the upper end of said shank having welded thereto a rigid strip to form a T-shape therewith. Said strap **29** has countersunk or counterbored holes **30**, so it is riveted to said frame leg and lies therewithin therealong. A set screw **31** passes through the socket **27** and the slot **32** of the shank and is threadedly engaged in the threaded hole **33** in the capstan body; said threaded hole commencing at an outer flat surface on said body.

When a break occurs, after access is gotten to the mechanism **22**, the bolts or screws (not shown) mounting same are removed so it can be lowered. After discarding the broken off parts which may be either or both **21''**, **28''**, a cap or cup **34** is slid onto the stub **21'** which remains of the capstan, and the assembly raised so it can be remounted after allowing the lower end of the broken shank **28'** to enter into the slot **35** in the floor wall of said cap **34**. After the mechanism is mounted in place, the set screws **36, 37** are used to secure the assembly as shown in FIG. 7. The vent regulator is thus repaired and again in working condition. The said cup stands on the mechanism's body **38**, the shank **28'** fits in the slot **35** and the capstan **21'** fits the cap.

All the repairman needs now in stock is a supply of said caps, two or three sizes of which will fit all regulator assemblies **22** presently in use. Heretofore he had to keep on hand a supply of the entire mechanisms **22** and replacement shanks besides equipment to make the shank assembly of FIG. 3 which is a welding job for in the various styles of frames **17**, the strips **29** need be in special angular relation to the shank and many a time he even had to replace such frames.

In instances where the break is only in the capstan 21, the slot 32 through the shank 28, may receive a bolt therethrough which passes through the holes 39 and is retained by an outer nut tight up against the cap 34. If the break is in the capstan as shown in FIG. 5, such bolt if used would lie in the channel 33' and help make a stronger assembly. Though such bolt and nut are not shown, its use is believed well understood without further illustration. If the major part of the threaded hole 33 remains in the capstan after the break, it may be used for replacement of the original set screw 31 or another to suit.

The cap 34 should be tall so the shank if broken, could reach through the slot 25 and be engaged therein. The shank in this type of regulator may be other than flat as shown, so long as it is non-circular. Some shanks are flutted in the manner of the tip end of the shaft 25. In any event, the opening 35 shall be its counterpart, so when the shank is set therein, it will be held against relative rotary movement.

This invention is capable of various forms and numerous applications without departing from the essential features herein disclosed. It is therefore intended and desired that the showing herein shall be deemed merely illustrative and not restrictive and that the patent shall cover all patentable novelty herein set forth; reference being had to the following claims rather than to the specific description herein to indicate the scope of this invention.

I claim:

Means for the repair of a hand-operated vent regulator assembly of the type including a capstan member having

an axial socket in which originally a non-circular shank member was engaged, either or both of which members have a part broken off therefrom, comprising a tubular structure adapted to receive what is left of said members into the ends thereof respectively; said tubular structure being a cup having an opening through its bottom wall; said cup receiving the remains of said capstan member into its mouth end and said opening being adapted to receive what is left of the shank member, and screw means on said cup, adapted to be tightened to maintain the assembly of said cap and said members, comprising one set screw threadedly engaged through the bottom wall of said cup in a threaded hole extending radially from the outer peripheral surface of said cup to said opening and a second set screw threadedly engaged through the peripheral side wall of said cup near the mouth of said cup; said cup having a hole through its peripheral side wall, in alignment with a threaded hole portion through the capstan member.

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