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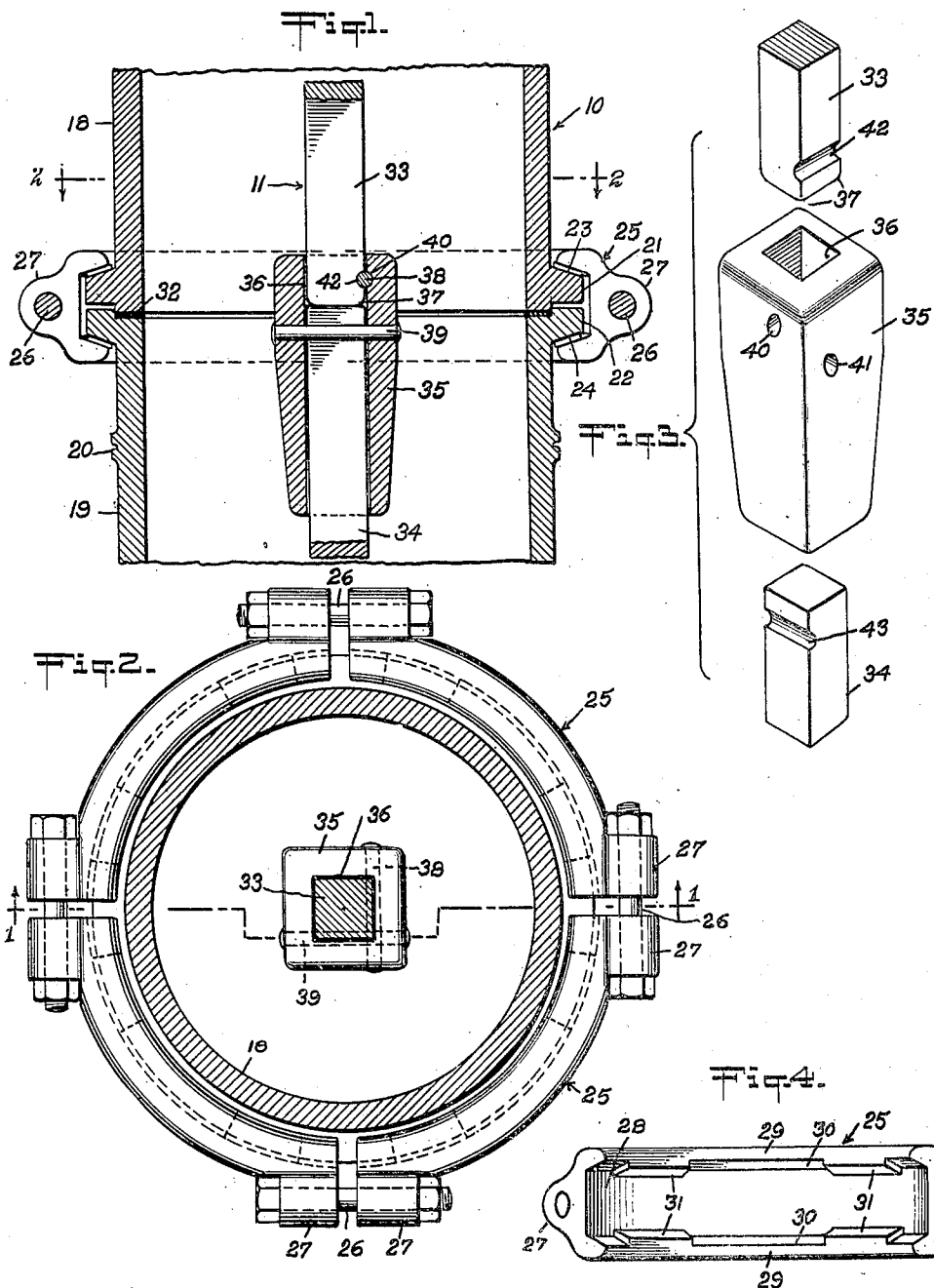
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2,340,965

HYDRANT ASSEMBLY

Filed Feb. 4, 1942

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 5.

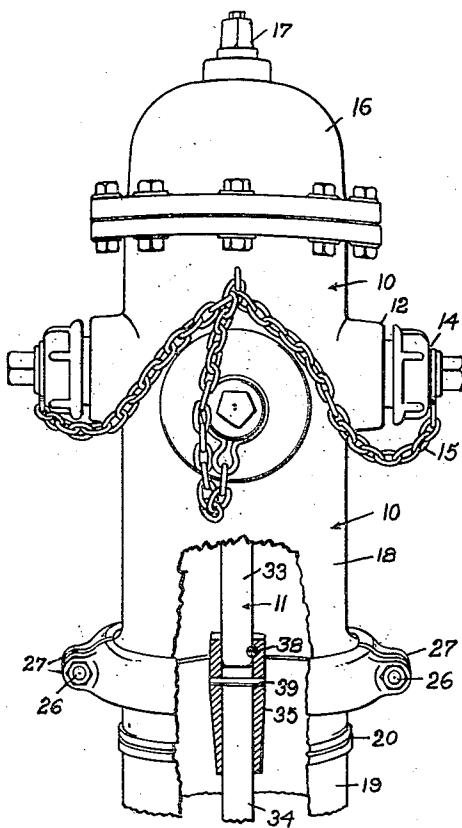
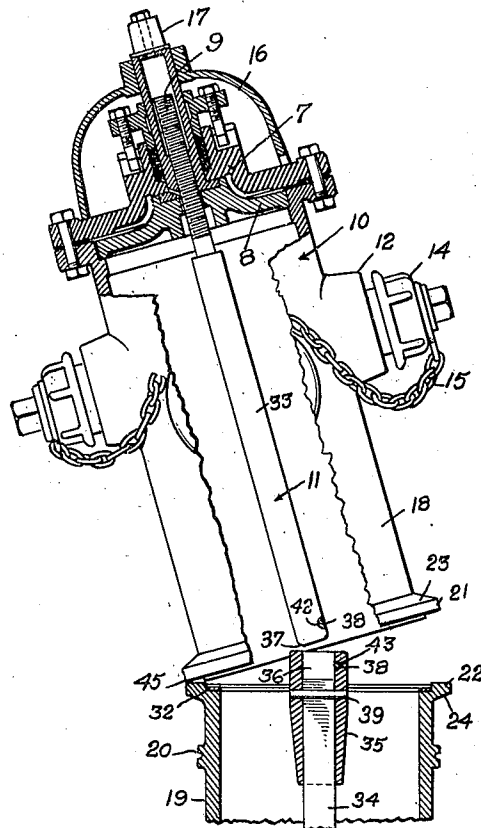


Fig. 6.



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HYDRANT ASSEMBLY

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6 Claims. (Cl. 287-108)

This invention relates to an improved hydrant assembly for use in a fire hydrant or the like.

It is an object of the present invention to provide an improved hydrant assembly which minimizes and localizes the damage to the hydrant, and facilitates the repairing thereof when the hydrant is struck by a vehicle, or is otherwise subjected to a sharp impact.

A further object is the provision of an improved hydrant rod and hydrant rod coupling for holding two sections of the rod together during the normal operation of the hydrant, but which permits the separation of the sections or the withdrawal of one section from another without injury to the hydrant rod or to any substantial portion of the coupling when the hydrant is subjected to a severe impact, as when it is struck by a motor vehicle.

With these and other objects in mind, reference should be had to the accompanying drawings in which—

Fig. 1 is an elevational sectional view in the direction of the arrows on the line 1-1 of Fig. 2 showing portions of a hydrant assembly embodying my invention;

Fig. 2 is a sectional plan view of the hydrant in the direction of the arrows on the line 2-2 of Fig. 1;

Fig. 3 is a perspective view of portions of the hydrant rod sections and of the coupling for securing them together employed in my improved hydrant assembly;

Fig. 4 is an elevational view of one of the segments or units comprising the hydrant barrel coupling;

Fig. 5 is an elevational view of a hydrant assembly embodying my invention with portions of the barrel or casing and the coupling broken away to reveal the hydrant rod and rod coupling; and

Fig. 6 is an elevational view of a hydrant assembly embodying my invention showing the manner in which the upper hydrant section topples over when it is subjected to a severe impact and also the manner in which the upper rod section withdraws from the rod coupling.

My invention is illustrated as applied to one known type of fire hydrant, but it should be understood that it may be applied to other types of hydrants.

The hydrant illustrated comprises a casing or barrel, indicated generally by the numeral 10, having a valve operating rod 11 extending longitudinally through the central portion thereof. The hydrant barrel or casing is provided with the

usual water outlets 12, having removable caps 14 which may be connected to the casing by means of the chains 15, to prevent them from being lost or stolen. The top of the barrel or casing is closed by means of a cap 16, suitably secured to the upper end thereof, as by means of the illustrated bolts which extend through suitable bolting flanges.

The upper end of the hydrant rod 11 is threaded as shown at 9, and is received in a threaded socket formed in the lower end of operating nut 17. The lower end of the operating nut rests upon the thrust plate 8. A packing plate 7, having suitable packing material around the operating nut, is also provided. The hydrant rod 11 is held by suitable means (not shown) against rotation, and accordingly when the operating nut 17 is rotated, it causes longitudinal shifting of the hydrant rod which, in turn, causes opening and closing of the valve. The hydrant shown, is of such a type that the bonnet 16, the operating nut, and the packing and thrust plates, may be removed and thereafter the hydrant rod may be rotated by a special wrench to cause the removal of the valve and associated parts.

The hydrant construction so far described represents one conventional form of hydrant, and is merely intended to illustrate one type of hydrant to which my invention may be applied, and I do not intend to limit my invention to this specific form of hydrant construction.

The hydrant casing or barrel 10 is formed of two superimposed cylindrical sections 18 and 19, adapted to fit together end to end, with the upper section 18 superimposed upon the lower section 19, as shown. The point of connection between the two sections is preferably slightly above the ground line, the ground line being preferably indicated on the lower section 19, as by means of the beads or rings 20 cast integrally thereon. The lower end of section 18 and the upper end of section 19 are provided with outwardly projecting coupling flanges 21 and 22, respectively, which taper outwardly toward their peripheries so that the upper surface of flange 21 extends angularly downwardly towards the periphery, as shown at 23, and the lower surface of flange 22 extends angularly upwardly towards the periphery thereof, as shown at 24.

Cooperating with the coupling flanges 21 and 22, I provide improved frangible coupling means which serves to retain the hydrant barrel or casing in assembled relationship during normal use and operation, but which will break and permit the upper section 18 to topple over without dam-

age thereto when it is struck by a motor vehicle, or is otherwise subjected to a severe and unusual impact.

The coupling means comprises a plurality of coupling segments 25, preferably four in number, connected together in the manner shown, as by means of the bolts 26 extending through apertures formed in the lugs 27, provided at the two ends of the segments. Each of the segments 25 is of the same construction and comprises a vertical wall 28 which is horizontally arcuate, having substantially the same curvature as the periphery of flanges 21 and 22, and which is adapted to be disposed around the outside of the flanges, in the manner shown. At the top and bottom of wall 28, I provide the inwardly projecting beads or flanges 29, having angularly disposed diverging confronting surfaces 30. In spaced relationship, on each of the surfaces 30, I provide a pair of elevated pads 31, also having diverging confronting surfaces.

When the four coupling segments are assembled around the coupling flanges 21 and 22, in the manner shown and the bolts 26 are applied thereto and tightened, the pads 31 exert a wedging action against the angularly disposed surfaces of the flanges, and accordingly the coupling means serves not only to couple the sections 18 and 19 together, but also serves to force the abutting ends of the sections together in sealing relationship and prevent leakage. In this connection, in order to insure a tight joint, the two sections may be provided with a mortised connection, as shown, and a gasket 32 may be interposed between the abutting ends.

The coupling members 25 should be of sufficient strength to couple the sections 18 and 19 together, and to retain them in coupled relationship during normal use and operation. However, they should be relatively more fragile and frangible than the sections 18 and 19 so that one or more of the segments will break and release the coupling when the hydrant is subjected to a severe and unusual impact, as for instance, when it is struck by a motor vehicle. In this connection, the hydrant barrel or casing sections are generally formed of castings, and the segments 25 may be cast from similar metal, but should be of somewhat lighter or thinner construction than the barrel or casing itself. In this way any severe and unusual impact will cause the breaking of one or more of the segments 25 and will permit the upper portion of the hydrant to topple over, in the manner shown in Fig. 6, without causing any damage to any portion of the hydrant other than the coupling.

It will thus be seen that the coupling segments 25 serve to couple the hydrant barrel sections together during normal use or operation and will minimize or localize the damage to the hydrant in the event of an unusual and severe impact. After one or more of the coupling segments have been broken, and the hydrant has been toppled over, it is a relatively simple matter to restore the hydrant casing to its normal condition by simply superimposing the section 18 upon the section 19, replacing the broken segment or segments, and applying and tightening the bolts 26.

In order to prevent injury to the hydrant rod 11, in the event of a severe and unusual impact, I provide a rod and rod coupling of improved construction. Thus, the rod is formed in two sections 33 and 34, which abut end to end at approximately the same level as the joint between the sections 18 and 19 of the hydrant barrel or

casing. Section 33 is supported at its upper end by the operating nut and thrust plate, as shown. The lower section 34 of the hydrant rod connects in the usual manner with the valve (not shown).

The abutting ends of the sections 33 and 34 are coupled together by means of a coupling comprising a sleeve 35 which embraces the ends of the rod sections, in the manner shown. The rod sections 33 and 34, or at least the portions thereof which project into the sleeve 35, are of non-circular configuration in cross section, and the opening through the sleeve is of similar configuration so that rotation of one of the rod sections causes rotation of the sleeve and of the other rod section. In the preferred form of my invention illustrated in the drawings, the rod sections are square in cross section and the opening 36 in the coupling sleeve 35 is of similar shape.

The rod sections and rod coupling are so formed that when the upper portion of the hydrant is toppled over, in the manner illustrated in Fig. 6, due to a severe and unusual impact, one of the rod sections will withdraw from the coupling, releasing the connection between the rod sections without injury to the coupling sleeve or rod sections. In the preferred form of my invention, illustrated in the drawings, I prefer to have the upper rod section 33 withdraw from the coupling, and to facilitate this action I form the coupling sleeve 35 so that it embraces only a relatively short portion of the lower end of rod section 33. The coupling sleeve may embrace a considerably longer portion of the rod section 34, as shown in the drawings. Also there should preferably be a slight clearance between the sides of rod section 33 and the inner walls of coupling 35 so that the rod section 33 may be disposed at a slight angle to the coupling, in withdrawing therefrom, without distortion thereof. However, the clearance between the rod section and coupling sleeve should not be of such an amount as to permit them to rotate with respect to each other. I have also found that the withdrawal of the upper rod section 33 is facilitated by rounding the corners at the lower end thereof, as shown at 37.

To retain the coupling sleeve 35 in the proper position, I provide a pair of pins 38 and 39 extending through the apertures 40 and 41 in the coupling sleeve, and through the grooves 42 and 43 in the rod sections. It will be seen that the portions of the pins 38 and 39 extending transversely of the aperture 36 are accommodated partially by the grooves 42 and 43 in the rod sections, and partially by similar grooves formed in the side walls of the aperture 36.

The pins 38 and 39 should be of sufficient strength to withstand the strains and stresses resulting from the ordinary operation and use of the hydrant. Thus they should be of sufficient strength to support the coupling 35 in position, and in that form of hydrant in which the valve and lower rod section 34 are supported from the upper rod section, the pins 38 and 39 should be of sufficient strength to withstand the forces and stresses resulting from the weight of the valve and rod section 34, and also those strains and stresses resulting from the tightening of the valve. However, at least the upper pin 38 should be of such a character as to shear off and to permit the withdrawal of the upper rod section 33 when subjected to unusual strains and stresses in a direction extending longitudinally of the hydrant rod. I have found that it is desirable to form the pins 38 and 39 from brass which will not readily or rapidly corrode and accordingly

can be readily removed even after they have been in use for some time.

I wish to point out at this time that the pins 38 and 39 do not have to withstand or transmit any of the torque or rotary forces resulting from the turning of the hydrant rod in removing the main valve. Due to the fact that the rod sections 33 and 34 are of non-circular configuration, and that the aperture 36 through the coupling sleeve conforms to the configuration of the rod sections, the torque is transmitted solely by the rod sections and coupling sleeve.

The coupling sleeve 35 should be of substantially nonfrangible construction and may be formed of cast iron or similar metal. It preferably tapers from the upper end toward the lower end thereof, in the manner shown, so as to permit the free passage of the water therearound.

In operation, the hydrant rod and coupling are assembled in the manner heretofore described, with the sleeve disposed around the abutting ends of the rod sections and with pins 38 and 39 inserted in the apertures and grooves. The valve may then be opened in the usual manner by rotating the operating nut 17. The coupling is of such a character as to retain the rod sections in coupled relationship during normal operation of the hydrant. When the hydrant is subjected to a severe and unusual impact, such as being hit by a motor vehicle, causing the upper section of the hydrant to topple over, in the manner shown in Fig. 6, the upper portion of the hydrant will at first pivot around the portion of the flanges 21 and 22, substantially opposite to the point at which the impact occurred, as shown at 45. The pivoting of the hydrant in this fashion, around the fulcrum point 45 on the flanges, serves to exert an upward pull upon the rod section 33, due to the fact that the rod section is attached to and supported by the upper portion of the hydrant. At the same time the lower rod section 34 is retained in position by means of the valve assembly. The forces exerted by the pulling of the rod section 33, with respect to the rod section 34, causes pin 38 to shear off, and the lower end of rod section 33 to withdraw from the coupling sleeve 35, as shown in Fig. 6. Accordingly, the entire upper portion of the hydrant is free from any attachment with the lower portion of the hydrant.

The withdrawal of rod section 33 from the coupling sleeve takes place without any damage to the rod sections or to the coupling sleeve, and in reassembling the hydrant, it is only necessary to reinsert the lower end of rod section 33 into the coupling sleeve 35 and to force a new pin 38 into position.

The pin 38 also serves another useful function. Sometimes an inexperienced operator may turn the operating nut 17 in the wrong direction, shifting the hydrant rod 11 upwardly when the main valve is already seated against its valve seat. Ordinarily, this may cause injury to the valve or valve seat. However, the pin 38 serves as a safety device and shears off before any damage has been sustained by the valve or valve seat.

We have previously described the manner in which the coupling segments 25 operate, and the manner in which the hydrant casing or barrel may be reassembled, and it is accordingly unnecessary to repeat this description.

In the illustrated embodiment of my invention, I have shown a coupling sleeve 35 which is so formed that the upper rod section 33 is adapted to withdraw therefrom, in the event of unusual

longitudinal stresses or strains. It should be understood that the coupling sleeve may be so formed that the lower rod section may withdraw therefrom. It should also be understood that the coupling sleeve may be formed integral with one of the rod sections and that the other rod section may project into the sleeve, in the manner that the rod section 33 projects into sleeve 25.

From the foregoing description of my invention, it will be appreciated that I have provided an improved hydrant assembly which minimizes and localizes the damage to the hydrant, and facilitates the repairing thereof when the hydrant is struck by a vehicle, or is otherwise subjected to a sharp impact.

Modifications may be made in the illustrated and described embodiment of my invention without departing from the invention as set forth in the accompanying claims.

I claim:

1. In a hydrant assembly, a hydrant rod comprising a plurality of separate sections, and coupling means for coupling two of the sections together end to end, said coupling means comprising a coupling member connected to one of the hydrant rod sections and provided with an aperture therein, said coupling member embracing the end of the other hydrant rod section, the said last-mentioned hydrant rod section projecting into the aperture for a relatively short distance only, and a shear pin connecting the last-mentioned hydrant rod section to the coupling member, said shear pin being of sufficient strength to withstand the strains and stresses resulting from ordinary operation of the hydrant, but being formed so as to shear off when subjected to unusual strains and stresses in a direction substantially longitudinally of the hydrant rod, whereby the last-mentioned hydrant rod section automatically withdraws from the coupling and releases the coupling when the upper portion of the hydrant assembly topples over.

2. In a hydrant assembly, a hydrant rod comprising a pair of separate sections, and coupling means for coupling the sections together end to end, said coupling means comprising a coupling member connected to one of the hydrant rod sections and provided with an aperture therein, said coupling member embracing the end of the other hydrant rod section, the portion of the said last-mentioned hydrant rod section projecting into the aperture being of non-circular configuration in cross section, and the aperture in the coupling member being of corresponding configuration so that rotation of the hydrant rod section causes rotation of the coupling member, and there being a slight clearance between the sides of the aperture and the last-mentioned hydrant rod section whereby said hydrant rod section automatically withdraws from the aperture and releases the coupling when the upper portion of the hydrant assembly topples over.

3. In a hydrant assembly, a hydrant rod comprising a pair of separate sections, and coupling means for coupling the sections together end to end, said coupling means comprising a coupling member connected to one of the hydrant rod sections and provided with an aperture therein, said coupling member embracing the end of the other hydrant rod section, the end portion of the said last-mentioned hydrant rod section being of non-circular configuration in cross section, and the aperture in the coupling member being of corresponding configuration so that rotation of the hydrant rod section causes rotation of the cou-

pling member, said last-mentioned hydrant rod section projecting into the aperture for a relatively short distance only, and there being a slight clearance between the sides of the aperture and the last-mentioned hydrant rod section, and a shear pin connecting the last-mentioned hydrant rod section to the coupling member, said shear pin being of sufficient strength to withstand the strains and stresses resulting from ordinary operation of the hydrant, but being formed so as to shear off when subjected to unusual strains and stresses in a direction substantially longitudinally of the hydrant rod, whereby said hydrant rod section automatically withdraws from the aperture and releases the coupling when the upper portion of the hydrant assembly topples over.

4. A hydrant assembly comprising a casing member having a portion projecting above the ground level, a hydrant rod extending longitudinally of the casing and formed of a plurality of sections, one of the sections being connected to the portion of the casing which projects above the ground, and coupling means for coupling the last-mentioned section to another section of the hydrant rod and comprising a coupling member connected to the end of one of the coupled sections and provided with an aperture therein, said coupling member embracing the end of the other coupled section, the last-mentioned section projecting into the aperture for a relatively short distance only, whereby it automatically withdraws therefrom and releases the coupling when the upper portion of the hydrant assembly topples over.

5. In a hydrant assembly, a hydrant rod comprising a pair of separate sections, and coupling means for coupling the sections together and comprising a sleeve embracing the end portions of the hydrant rod sections, shear pins connecting said sleeve to the hydrant rod sections, portions of the hydrant rod sections embraced by the sleeve being of non-circular configuration in cross section and the sleeve being of corresponding configuration so that rotation of one of the hydrant rod sections causes rotation of the other hydrant

rod section, one of the hydrant rod sections projecting into the sleeve for a relatively short distance only and there being a slight clearance between the sleeve and the last mentioned hydrant rod section whereby said hydrant rod section automatically withdraws from the sleeve and releases the coupling when the upper portion of the hydrant rod assembly topples over.

6. A hydrant assembly comprising a casing having a portion projecting above the ground level, a hydrant rod extending longitudinally of the casing and formed of a pair of sections, one of which is secured to the portion of the casing projecting above the ground and the other of which is attached to the valve of the hydrant assembly, and coupling means for coupling the two sections together, said coupling means comprising a coupling member connected to one of the hydrant rod sections and provided with an aperture therein, said coupling member embracing the other hydrant rod section, the portion of said last mentioned hydrant rod section projecting into the aperture for a relatively short distance only and there being a slight clearance between the last mentioned hydrant rod section and the sides of the aperture of the coupling member, said portion on the last mentioned hydrant rod section being of non-circular configuration in cross section and the aperture in the coupling member being of corresponding configuration so that rotation of the hydrant rod section causes rotation of the coupling member, and a shear pin connecting the last mentioned hydrant rod section to the coupling member, said shear pin being of sufficient strength to withstand the strains and stresses of the ordinary operation of the hydrant but being formed to shear off when subjected to unusual strains and stresses in a direction substantially longitudinally to the hydrant rod whereby the last-mentioned hydrant rod section may withdraw from the coupling member when the portion of the casing projecting beyond the ground level topples over.

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