Feb. 25, 1941. J. W. ROONEY 2,233,326

HINGE

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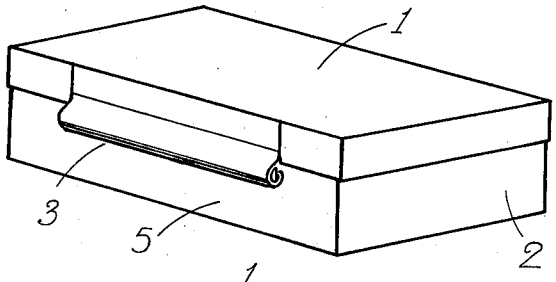


Fig. 1.

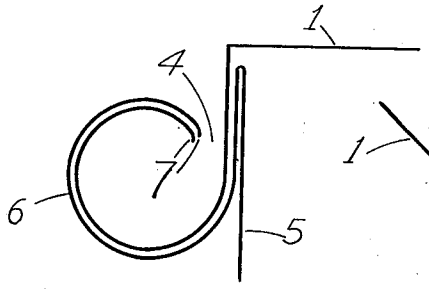


Fig. 2.

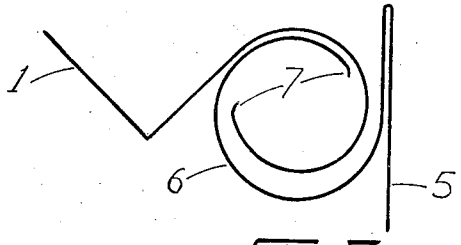


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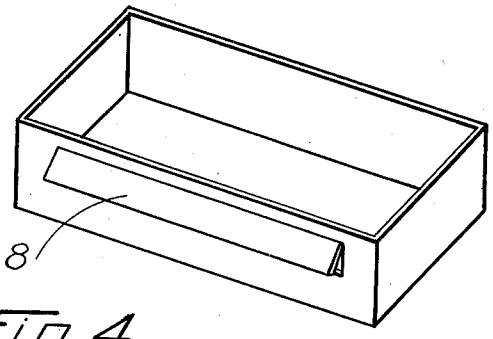


Fig. 4.

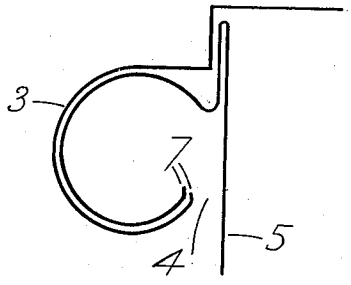


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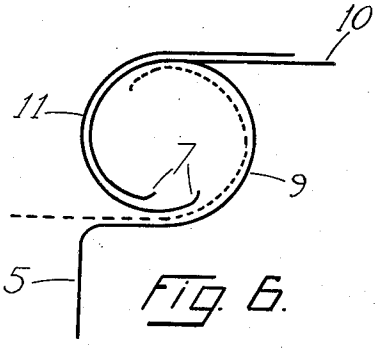


Fig. 6.

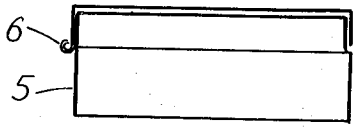


Fig. 7.

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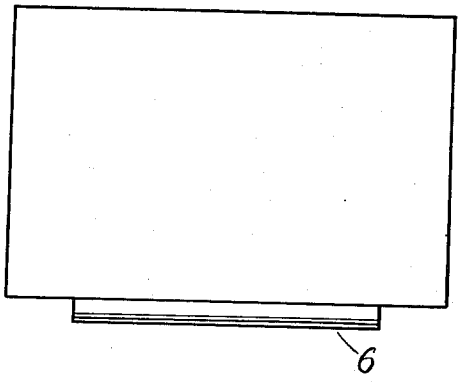


Fig. 8.

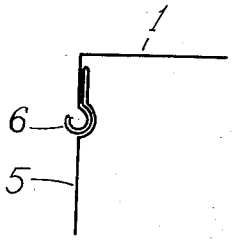


Fig. 9.

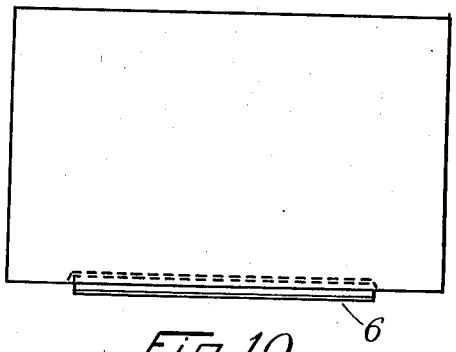


Fig. 10.

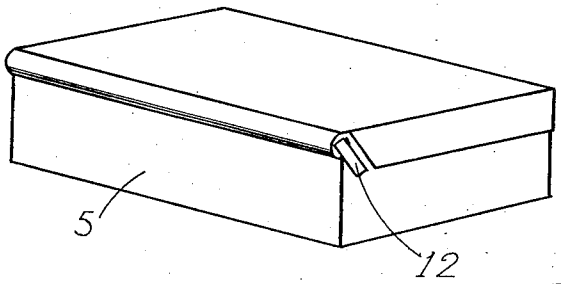


Fig. 11.

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UNITED STATES PATENT OFFICE

2,233,326

HINGE

John William Rooney, Dunedin, Otago, New Zealand

Application June 7, 1937, Serial No. 146,951
In New Zealand June 13, 1936

1 Claim. (Cl. 220—31)

This invention has for its object the provision of an improved hinge movement adapted more particularly to join the lids to the bodies of canisters, containers, tobacco tins, match boxes and other receptacles and is characterised by the lid being joined to the body by hinge parts formed of the lid and body parts.

An important feature of the invention is that the hinge pin may be altogether dispensed with. One benefit of this feature is the simplification of manufacture obtained by eliminating the necessity for handling the loose hinge pin and for the consequent operations when assembling the lid and body.

A general description of hinges made according to this invention shows them to comprise part-cylindrical rolls projecting from the engaging edges of the body and lid parts, the rolls being formed so that one will enter and partially rotate inside the other.

To achieve this, neither roll is a complete circle, but the terminal edge of each is open or separated from the body or lid at the termination of the roll. The axis of relative pivoting of the rolls is approximately the turning axis of the hinge.

That the invention may be better understood, preferred adaptations of my invention are shown in the accompanying drawings, in which—

Figure 1 is a perspective drawing of a flat tobacco-type of container embodying the invention.

Figure 2 is an enlarged end elevation of rolls forming hinge parts with the lid of the container closed.

Figure 3 is an end elevation of such rolls with the lid of the container open.

Figure 4 is a perspective drawing of part of the back of a container cut to provide material for a roll.

Figure 5 is an end elevation of an adaptation in which an inner roll projects from the body of a container and an outer roll projects from the container lid.

Figure 6 is an end elevation of a hinge wherein a roll is formed so as not to project outwardly from the container.

Figure 7 is a vertical section through a container having a hinge as shown in Figures 2 and 3.

Figure 8 is a plan of the container shown in Figure 7.

Figure 9 is a vertical section through hinge rolls partly offset or recessed into the back of the container to prevent axial disengagement of the rolls.

Figure 10 is a plan of a container with a partially recessed hinge as in Figure 9.

Figure 11 is a perspective drawing showing means for preventing axial disengagement of the rolls.

In the construction shown in Figure 1, the invention is applied to a flat tobacco-box type of sheet-metal container in which the hinge parts are made of the lid and body material 2.

On the back of the lid 1 is made a dependent flat strip of the length of the hinge, projecting from the back edge of the lid. To form the roll 3 this strip is bent outwards and then from its terminal edge is curled downwards and round as though to enclose a hinge pin. As already described, the curled roll does not form a complete circle, an opening or passage-way 4 occurring between the terminal edge of the roll 3 and the back of the lid.

The other roll is curled on the back 5 of the body of the box by making vertical cuts in said back and curling the part between said cuts outwardly and then downwardly and around so that it nearly meets the flat of the back 5 of the tin; a passage-way 4 being left between its terminal edge and the back of the tin.

The lid 1 can be slid into position upon the box body by passing the lid roll along the passage in the body roll. The roll of the lid enters and slides, in effect, into and out of the body roll as the lid is opened and closed.

In the adaptation shown in Figures 2, 3 and 7 and 8, the back 5 of the body of the container is initially higher than the sides and front edges thereof, the extra material being bent downwards and around to form the outer roll 6.

The lid is left longer at the back than at the sides and front to provide material for the lid roll.

The terminal edge of each of the rolls is bent over to provide a round corner 7, for the other roll to bear against when turning.

In the construction shown in Figure 4, the top edges of the container are the same height all round and a strip of material for the outer roll is provided by making a horizontal cut in the back 5 of the body and a short vertical cut from each end of the said horizontal cut. A strip 8 or flap of the material is thus separated from the body except at its upper extremity. This strip is fashioned into a roll by bending it outwards and then curling it upwards and around into the required shape.

Figure 5 illustrates an adaptation in which an inner roll projects from the body of the container and an outer roll projects from the lid.

In this construction, the passage-way or gap 4 at the terminal edge of the outer roll 3 is on the lower side of the hinge.

In the construction shown in Figure 6, a roll 9 is formed at the rear top edge of the container back 5 with its top surface level with the top surfaces or edges 10 of the sides and front of the container.

In this construction, as in that illustrated in Figures 1 and 5, the inner roll is part of the body and the outer roll is dependent from the lid.

In this adaptation, the back edge of the lid is formed into a curved roll 11 to extend (when the lid is closed) round the body roll 9 from its top surface to a point inside its terminal edge 7. When the lid is opened, the lid roll 11 will turn around and into the body roll 9 as shown by dotted lines in Figure 6. The terminal edge of the inner roll is slightly bent inwards as at 7 to provide a smooth bearing edge.

In a container having hinges of this type, the roll 9 on the body extends from side to side, and is inside the container itself, so that when the lid is assembled on the body roll no sideways withdrawal is possible owing to the retaining effect of the container ends.

One means of assembling the lid on the body is to first form the roll on the lid and partly form the roll on the body and to place the lid in its open position assembled, and to press the roll on the body down into its final shape.

In Figure 11 is shown means for preventing axial disengagement of the rolls, such means comprising pieces of sheet metal 12 soldered to the ends of the container.

Alternatively, suitable tags may be formed on the roll, and bent downwards to act as stops to prevent axial withdrawal of one roll from the other. This is not shown in the drawings. In another construction, the outer roll is made the longer and its ends are bent inwards or otherwise mis-shaped to prevent sliding axial withdrawal of the inner roll. The assembled rolls may instead be offset into, or recessed in the container back 5 sufficiently to prevent axial withdrawal one from the other, as shown in Figures 9 and 10.

This setting back operation is performed after the lid and body are assembled together and is a preferred method of preventing dissembling of the lid and body parts.

In manufacture, the rolls are preferably formed on each part separately, by means of curving dies and rolls as are known in the art. As the containers are generally made of thin sheet metal the required shapes can be secured with interchangeable regularity. The lid and body are assembled by sliding the hinge roll of one into the hinge roll of the other, when the lid is in open position.

What I claim as new and desire to secure by Letters Patent is:

An improved hinge for a sheet metal container having a lid including a roll portion formed integrally with the back of the lid and engaging and overlying a roll portion formed integrally with the top portion of the back of the container, the construction being such that the lid roll portion will enter into the body roll portion when the lid is opened, the hinge being off-set or recessed into the back of the container, the rolls forming said hinge being of less length than the wall forming the back of said container and being off-set inwardly therefrom a distance sufficient to position the outer surface of the roll of the lid in substantially tangential relation with the plane of the back wall.

JOHN WILLIAM ROONEY.