

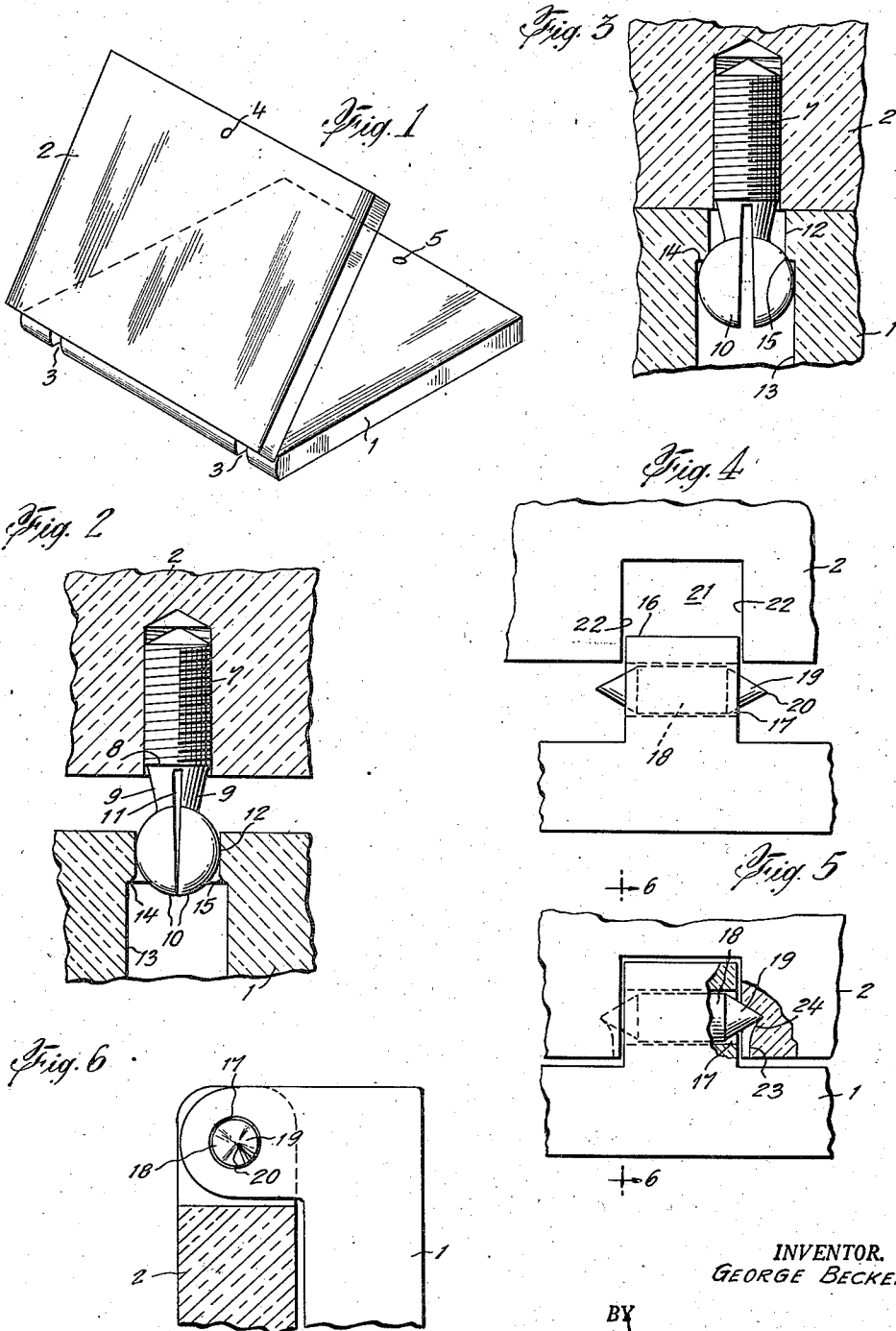
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HINGE AND LATCH CONSTRUCTION

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HINGE AND LATCH CONSTRUCTION

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The present invention is directed to hinge and latch structures adapted to be used in co-operation with each other or separately.

Various structures of this type have in the past been known and used. They have been satisfactory from the standpoint that they accomplished the desired purpose but most of such structures were relatively complicated and were considerably expensive. Also, in connection with some materials particularly for containers consisting of a receptacle and a cover, where at least one of the elements is of molded or other plastic, difficulty arose in combining metal parts of the hinge and latch with the non-metallic materials of the container. Therefore complications arose in attempting to provide a satisfactory hinge and latch arrangement for plastic containers.

The present invention is intended and adapted to overcome the difficulties and disadvantages of the prior art and to provide a structure of hinge and latch which is quite simple, which requires a minimum of parts and which may be assembled without the necessity of expensive machines or highly skilled labor.

It is also among the objects of the present invention to provide a container of plastic material and combine therewith a single metallic part which constitutes the hinge of the container.

It is still further among the objects of the present invention to provide a latch in combination with a container which embodies but a single metal part and which is adjustable so as to provide an accurate latching arrangement.

In practicing the present invention, there is provided for example, a container having both the receptacle and cover of a molded plastic such as Lucite or the like. A knuckle is provided on one of the elements and a socket co-operating therewith is formed on the other element. The size and shape of the socket is such as to properly fit over the knuckle. Within the cylindrical opening of the knuckle is placed a metal pintle cylindrical in form and having the ends tapering to a point. The ends project a substantial distance beyond the end of the knuckle. By the use of sufficient pressure the pintle in the knuckle is pressed into the socket, the pointed ends thereof cutting a groove in the socket and coming to rest in a seat formed thereby. Because of the resiliency of the material surrounding the socket, there is a tendency for the groove to be filled by the material at least in part. This locks the pintle in place and gives a strong and effective hinge. It is necessary that only the element having the

socket be of resilient material to partially close the groove.

The present invention also contemplates a latch arrangement wherein a metal or other piece having a base or support and an extended head in the shape of a ball is integral therewith. The ball is split centrally so that transverse pressure may close the same to a lesser diameter. The support is held within one of the elements and the other element is provided with an opening of somewhat lesser diameter than the ball, said opening having an enlargement at its inner end to act as a seat for the ball. Thereby a tight resilient latch is provided which is capable of holding the two elements in closely fitting positions relative to each other.

The invention is more fully described in connection with the accompanying drawing constituting a part hereof, and in which like reference characters indicate like parts and in which,

Fig. 1 is a perspective view of a container provided with the hinge and latch arrangement of the present invention;

Fig. 2 is an enlarged vertical cross-sectional view of fragmentary character showing particularly the arrangement of latch, the elements being shown in partly open position;

Fig. 3 is a view similar to Fig. 2, showing the relative positions of the various parts when the latch is in fully closed position;

Fig. 4 is an enlarged vertical cross-sectional view fragmentary in nature, taken through the hinge structure of the present invention and showing the parts just prior to assembly thereof;

Fig. 5 is a view similar to Fig. 4, showing the pintle in its final position, and

Fig. 6 is a cross-sectional view taken along the line 6-6 of Fig. 5.

The invention is capable of adaptation to various elements as for example, a container consisting of a receptacle 1 and a cover 2. A pair of hinges 3 connects these two elements along one side thereof. A latch arrangement having two elements is provided at the side opposite the hinges. The cover 2 has a latch element 4 and a receptacle 1 carrying latch element 5.

There is provided in the cover a threaded opening 6 extending vertically from the lower surface of the cover. A support 7 of metal, or if desired of non-metallic material similarly threaded fits into the opening 6. On the lower face 8 thereof there is a downwardly tapering neck 9 terminating in a ball 10. Both neck and ball are cut transversely as shown at 11 so as to provide for

compression of the ball, reducing the dimensions thereof in the direction of the force.

In the top of receptacle 1 is an opening 12 of a diameter slightly less than the diameter of ball 10. Said opening is provided with an enlargement 13 providing a shoulder 14 between opening 12 and enlargement 13. Said shoulder has a beveled edge to act as a seat for the ball.

In assembling the latch arrangement, the support is threaded into opening 6 to a point where lower face 8 thereof is a short distance above the lower surface of cover 2. The cover is then moved downwardly so that ball 10 enters opening 12 causing the two parts of the ball to move towards each other, as shown in Fig. 2. As the cover is moved to its final position, the ball enters enlargement 13 and seats upon bevel 15, as shown in Fig. 3. If the cover does not fit tightly enough on the receptacle, a screw driver is introduced into slot 11 and is turned to cause support 7 to be raised into opening 6. If the cover does not contact with receptacle 1, then by means of the screw driver, support 7 is caused to move in the opposite direction until the ball seats properly.

In order to form a hinge for a plastic element, the receptacle 1, for example, is provided with a knuckle 16 of the usual type, having a cylindrical transverse opening 17 therein. A cylindrical pintle 18 of approximately the same diameter as opening 17 has tapered ends 19 terminating in sharp points 20. Said points extend beyond the two sides of the knuckle. A cover 2 is provided with a socket 21 of a width approximately equal to that of knuckle 16. The sides 22 of the socket are smooth.

In order to assemble the hinge structure, pintle 18 is introduced into the knuckle as shown in Fig. 4. Pressure is exerted on elements 1 and 2 to bring the knuckle fully within the socket. As the movement progresses, ends 19 contact with the edge of cover 2, then begin to form a groove 23 in faces 22. As pintle 18 progresses to its seat 24 cut by it in the plastic material, groove 23 partially closes so that the seat 24 is deeper in the material than the groove, as shown in Fig. 5.

It will be noted that both the hinge and the latch arrangement are extremely simple in construction. Each of them requires but a single part and the assembling of the part is a matter of only moderate skill or experience. The character of these parts is quite simple and they may be made cheaply in large quantities. Both the latch and the hinge are strong and effective and may be used under relatively difficult conditions with satisfactory results.

Although I have described the invention setting forth a single embodiment thereof, it will be apparent to those skilled in the art that many changes in the details may be made within the spirit of the invention. It is not necessary that Lucite be the plastic used as other materials, either plastic or non-plastic, may be substituted therefor. In the hinge structure, the socket should be formed in a material which has sufficient elasticity so that the groove is partially closed and preferably a plastic is used for this purpose. The hinge and latch may be used on various other articles than containers. For instance, the hinge arrangement may be used to connect up the links of a belt, such as is used in the operation of ro-

tating devices. It may also be used to link together ornamental or decorative pieces in a single line to provide such articles as bracelets and the like. Also, such elements may be provided with hinge parts on two or more of their sides whereby a substantial area of such pieces may be linked together for decorative purposes. Such an area may be used not only for decorative purposes but for other uses such as to form insulating pads for holding hot dishes. Various containers may be provided with the present hinge and latch, such as compacts, cabinets, and others. Where the element having the knuckle is of plastic, the knuckle may be made either of plastic or of metal.

From the above, it will be apparent that many changes in the details of construction may be made without departing from the principles set forth herein and the invention is therefore to be broadly construed and not to be limited except by the character of the claims appended hereto. In the claims, the word "cut" is intended to include the forming of the seat without actual cutting of the material.

I claim:

1. A hinge for holding two elements together comprising a cylindrical metal pintle having pointed ends, a hinge knuckle on one of said elements, said pintle being in said knuckle with the ends thereof extending therefrom, a socket in the other element into which said knuckle fits, said other element being of plastic material, the ends of said pintle resting in a seat cut in said material by said ends.

2. A hinge for holding two elements together comprising a cylindrical metal pintle having pointed ends, a hinge knuckle on one of said elements, said pintle being in said knuckle with the ends thereof extending therefrom, a socket in the other element into which said knuckle fits, said other element being of plastic material, the ends of said pintle resting in a seat cut in said material by said ends, and a groove extending from said seat to the edge of said other element.

3. A method of making a hinge joint which comprises providing a hollow knuckle on one element, providing a socket on a second element into which said knuckle may fit, said second element being of plastic material, introducing into said knuckle a cylindrical pintle having pointed ends, said ends extending beyond the ends of said knuckle and being of greater length than said socket, pressing said knuckle into said socket to cause said pointed ends to deform said plastic and provide a seat for said pintle.

4. A method of making a hinge joint which comprises providing a hollow knuckle on one element, providing a socket on a second element into which said knuckle may fit, said second element being of plastic material, introducing into said knuckle a cylindrical pintle having pointed ends, said ends extending beyond the ends of said knuckle and being of greater length than said socket, pressing said knuckle into said socket to cause said pointed ends to deform said plastic and provide a seat for said pintle, said plastic having substantial elasticity and at least partially closing the groove formed in said plastic by the passage of said pintle to its seat, whereby said pintle is held against accidental displacement.

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