July 16, 1940. W. J. HISCOCK 2,208,158

BOX AND HINGE COMBINED

Filed March 8, 1937 2 Sheets-Sheet 1

Fig. 1

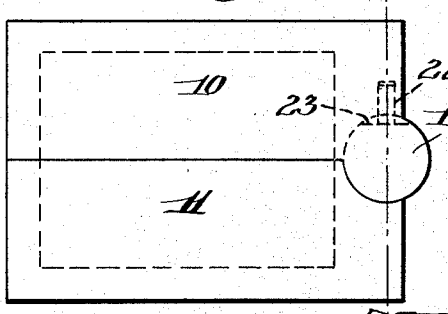


Fig. 2

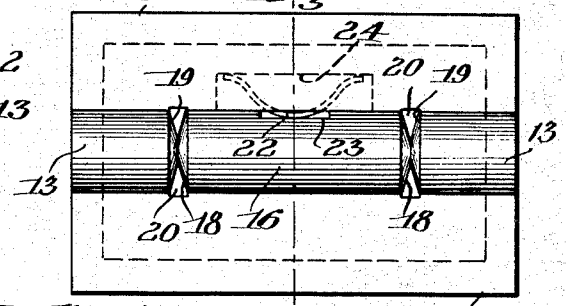


Fig. 7

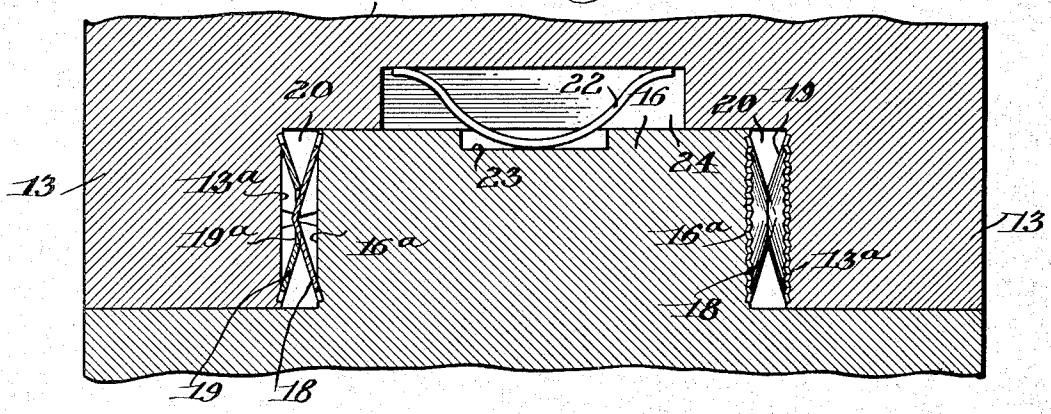


Fig. 8

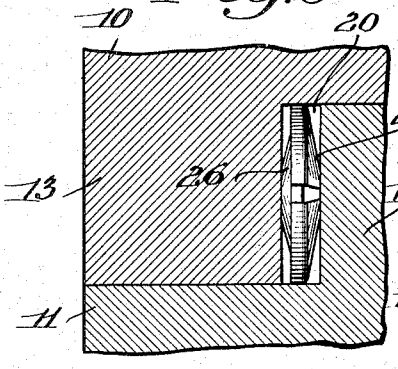


Fig. 9

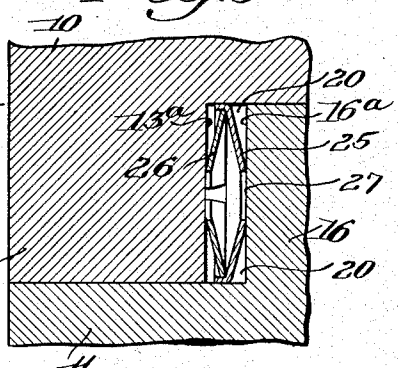


Fig. 10

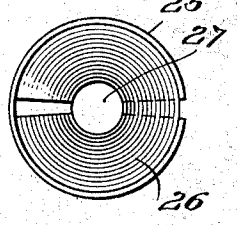


Fig. 11

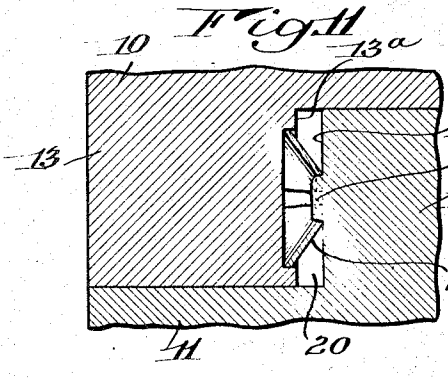
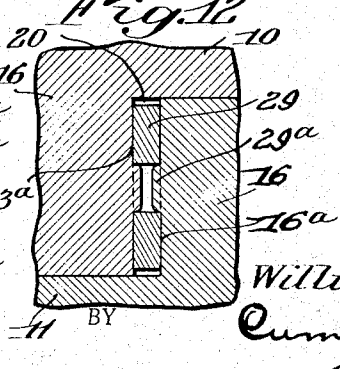


Fig. 12



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Fig. 5

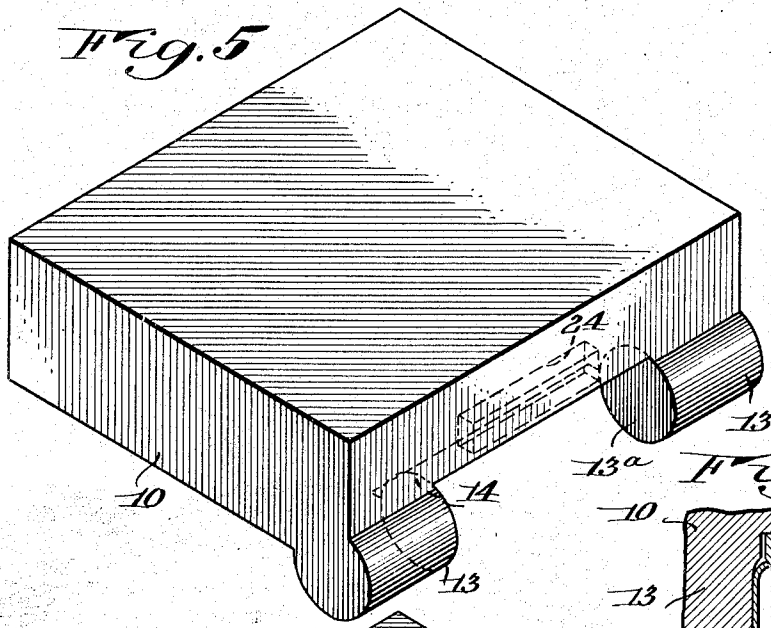


Fig. 3

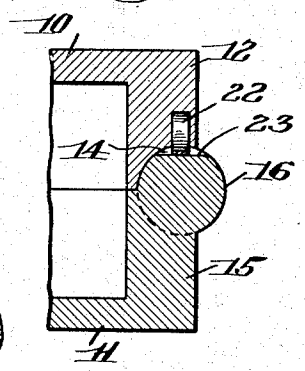


Fig. 16

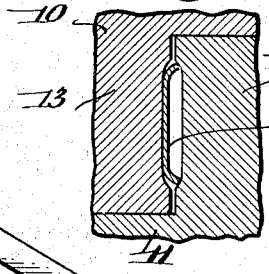


Fig. 4

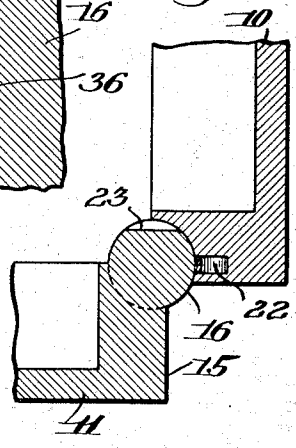


Fig. 6

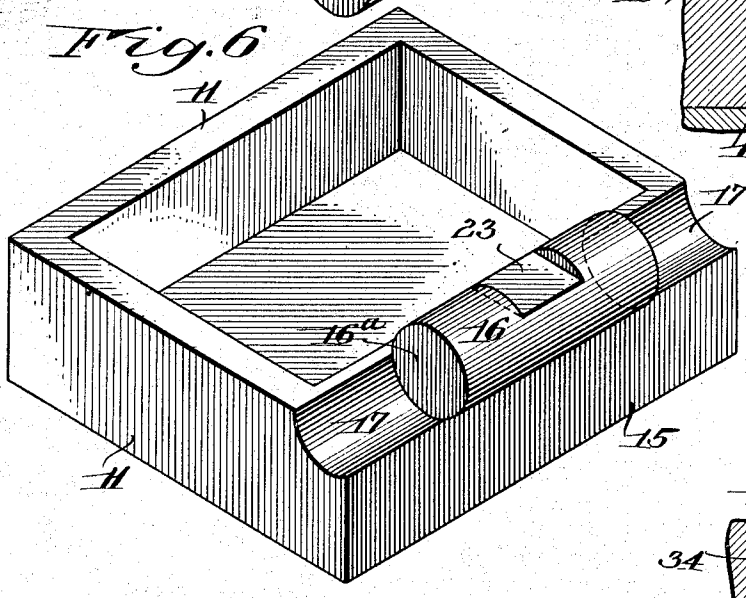


Fig. 15

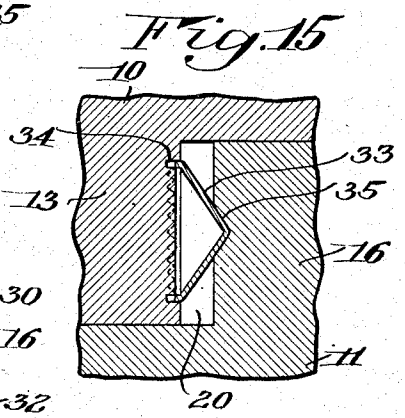


Fig. 13

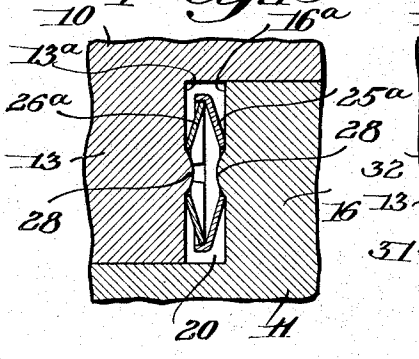
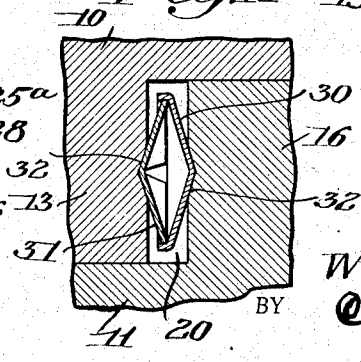


Fig. 14



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UNITED STATES PATENT OFFICE

2,208,158

BOX AND HINGE COMBINED

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Application March 8, 1937, Serial No. 129,679

14 Claims. (Cl. 220—31)

This invention relates to boxes or receptacles and more particularly to boxes or receptacles of the kind used as containers for small articles such, for example, as jewelry and other small ornaments or trinkets of different kinds.

One object of the invention is to provide a box or receptacle of this class embodying improvements resulting in a simplified and efficient construction which can be manufactured at a relatively low cost.

A further object of the invention is to provide improved hinge means for the box embodying relatively few parts so designed and arranged as to improve the appearance of the box and to increase its efficiency.

A further object of the invention is to provide an improved box of the class described comprising top and bottom sections having thereon cooperating hinge portions or members provided with improved means for maintaining the sections in hinged relation.

A further object of the invention is to provide in a box of the class described top and bottom sections so constructed as to include the means for hingedly connecting the same and in a manner to facilitate molding of the sections of suitable material and for the ready reception of inexpensive means for retaining the sections in hinged relation.

A further object of the invention is to provide a box or receptacle of the class described comprising top and bottom sections having alined cooperating hinge members preferably formed integral therewith and held in hinged relation by parts disposed within or interposed between the adjacent ends of the hinge members.

A further object of the invention is to provide in a box of the class described improved means for holding the top or cover of the box in open and closed positions.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is an end view of a box embodying the invention;

Fig. 2 is a rear view of the same;

Fig. 3 is a fragmentary sectional elevation on line 3—3 of Fig. 2;

Fig. 4 is a similar view with the cover of the box shown moved to open position;

Fig. 5 is a view in perspective of the cover or top section of the box drawn to an enlarged scale;

Fig. 6 is a view in perspective of the bottom section of the box also drawn to an enlarged scale;

Fig. 7 is a section on line 7—7 of Fig. 1 drawn to an enlarged scale;

Fig. 8 is a fragmentary sectional elevation of a modification showing a different device for retaining the sections of the box in hinged relation;

Fig. 9 is a similar view showing the retaining device in section;

Fig. 10 is an end elevation of the retaining device of Figs. 8 and 9 shown removed from the box sections;

Fig. 11 is a fragmentary sectional elevation of another modification showing a different retaining element for securing the hinge sections of the box in position one upon another, and

Figs. 12 to 16, inclusive, are fragmentary sectional elevations of different modifications illustrating slightly different retaining members for the hinge sections of the box.

The same reference numerals throughout the several views indicate the same parts.

Referring to the drawings, 10 and 11 represent the upper and lower or top and bottom sections of the box, respectively. The rear wall 12 of the upper section has thereon a pair of spaced substantially cylindrical hinge members 13, said wall also having formed therein between said members a substantially semi-circular groove 14, Fig. 3. The lower or body section 11 of the box has on its rear wall 15 a substantially cylindrical hinge member 16 terminating short of the ends of said wall, the latter having substantially semi-circular grooves 17 formed therein, as best shown in Fig. 6, it being understood that when the sections of the box are assembled as shown in Figs. 1 to 4, inclusive, that the hinge member 16 of the bottom section will lie between the hinge members 13 of the top section and within the groove 14 of the latter and that the hinge members 13 of the top section will lie within the grooves 17 of the bottom section. It will be further understood that although it is preferred to form the hinge members integrally with the box sections that they may be separately formed if desired and attached thereto by any suitable means.

The box sections may be constructed of any suitable material and by any preferred method, as by casting, molding, or otherwise, as desired. Preferably the sections are formed by molding the same of a suitable material such, for example, as Bakelite, rubber, or any other material

capable of being molded while in a plastic state and of hardening to the desired degree.

Several devices are shown in the different views of the drawings for retaining the box sections in assembled or hinged relation, each of which is disposed between the opposing adjacent ends of the hinge members 13 and 16. In the modification of the invention shown in Figs. 1, 2, and 7, a pair of inner and outer retaining members 18 and 19 are mounted within each of the pockets 20 formed by spacing the adjacent ends 13a and 16a of the hinge members 13 and 16 one from another. The members 18 and 19 each comprises a split disk formed of resilient or relatively thin material which will yield under pressure. Each of the members is dished or substantially cone-shaped, the outer member 19 having a centrally disposed opening 19a for the reception of the central portion of the inner member, as shown in Fig. 7. The peripheries of the disks, are serrated as shown, the teeth-like portions 21 of which are forced into the ends of the hinge members when applying the disks thereto, this being done if preferred when the molded material of the sections is in a semi-plastic or relatively soft condition. By thus applying the disks to the inner and outer ends of the hinge members 13 and 16, respectively, they will be firmly held in position thereon and will operate to center and support the hinge members in proper relation.

The sections of the box are assembled or connected by moving them into registering relation and forcing the hinge member 16 into position between the hinge members 13, at which time the retaining disks will be sufficiently compressed to permit the central portions of the inner disks to take into the openings of the outer disks, as shown in Figs. 2 and 7. In opening and closing the box by swinging the sections one upon another, relative rotation will be afforded between the inner and outer disks 18 and 19, the centers of which are coaxial with the axis about which one section is swung upon another.

The means for holding the sections in both open and closed relation comprises a spring 22 preferably of the leaf type, the central portion of which is seated on the flat surface 23 of the hinge member 16, the ends of the spring extending within a recess 24 formed in the upper section 10 of the box, Figs. 2 and 7. The spring overlies the axis of the hinge when the top of the box is in closed position as shown in Fig. 3, the spring thus having the tendency to move the sections at this point in opposite directions whereby the top section of the box is maintained in closed position upon the bottom section. However in moving the top of the box from the closed position shown in Fig. 3 to the open position shown in Fig. 4 the tension of the spring will be increased since the compression will obviously be greater when the spring is moved from the flat portion 23 of the hinge member 16 to the curved surface thereof, which is at a greater distance from the axis of the hinge than the flat portion. By thus increasing the tension of the spring the pressure exerted thereby will be sufficient to maintain the cover in open position. However, it will be understood that the spring would operate to maintain the cover in closed position if the hinge member 16 were not cut away to provide the flat portion 23, which portion serves to effectively seat the spring when the cover is in closed position.

The modification shown in Figs. 8, 9, and 10 is similar to that shown in Fig. 7, in that the inter-engaging split disks are positioned within the spacings or pockets 20 formed between the adjacent ends of the hinge members 13 and 16. The inner and outer retaining disks of the modification are indicated at 25 and 26, respectively, the latter being flanged and the former having its peripheral edge disposed therein and in engagement with the flange thereof, as best shown in Fig. 9. The diameter of the disk 25 is substantially the same as that of the cylindrical hinge member upon which it is seated so that the disks are made to fit snugly within the cylindrical pockets 20 in order to maintain the hinge members in alinement and the box sections in proper relation one relative to another. The retaining disks 25 and 26 are provided with centrally disposed openings 27 to increase their flexibility and to reduce the frictional resistance between their outer faces and the end walls of the hinge members upon which they are seated. It will be understood that in assembling the box sections of this modification that the disks will become slightly compressed upon forcing the hinge member 16 between the ends of the hinge members 13 and that, due to the resiliency of the disks, they will tend to expand and will therefore exert pressure in opposite directions upon the hinge members 13 and 16, thus maintaining them in proper assembled relation.

In the modification shown in Fig. 13 it will be understood that the construction of the split disks 25a and 26a is substantially the same as that of the disks 25 and 26 and furthermore that the former will operate and function in the same manner as the latter, the principal difference in the modification of Fig. 13 and that shown in Figs. 8 to 10, inclusive, being that the disks 25a and 26a are made slightly smaller and that they are supported in central position within the pockets 20 by the projections or boss-like members 28 formed on the adjacent ends of the hinge members 13 and 16 as illustrated in Fig. 13.

In the modification shown in Fig. 11 the split disk 26a, or one constructed in the same manner, is interposed between the opposing ends of the hinge members 13 and 16 and in which case the inner ends of the hinge members 13 are recessed to receive the peripheral edges of the disks, while the ends of the hinge member 16 are provided with boss-like projections 28a which extend within the central openings of the disks 26a, as shown in Fig. 11.

In the modification shown in Fig. 12 the retaining member 29 is in the form of a relatively thin disk or washer, within the central portion of which extend the projections or boss-like members 29a formed centrally of and on the adjacent ends of the hinge members 13 and 16. The washers may be forced upon the projections 29a of either the inner or outer hinge members. After assembling the sections by moving the hinge members to final position one relative to another, the projections 29a will each lie within the opening of the washer, as shown in Fig. 12, in which position of the parts the sections will be retained in proper relation one upon another.

The modification shown in Fig. 14 is somewhat similar to that shown in Fig. 13, the difference being that the projections or boss-like members 28a of the hinge members are omitted, the split disks 30 and 31 of Fig. 14 not being provided with openings but having their central portions extended within correspondingly shaped recesses 32 formed in the adjacent end walls of the hinge

members 13 and 16. After securing the retaining devices of this modification in position upon the ends of the hinge member or members of one or the other of the sections, the sections are assembled by moving them into registering relation and forcing the hinge member 16 between the ends of the hinge members 13, at which time the resilient split disks will be compressed within the pockets 20 formed between the adjacent ends of the hinge members and will assume the position shown in Fig. 14, in which they will act as pivotal connections between the ends of the hinge members as well as means for retaining the sections in assembled relation.

In the modification shown in Fig. 15 the devices interposed between the ends of the hinge members for retaining and supporting the box sections in proper assembled relation are each formed of a single member comprising a dish-shaped section 33 the peripheral edge portion of which is serrated to form the teeth-like portions 34 which are forced into the end of the hinge member to which the device is applied. The central portion of said device is disposed within a recess 35 centrally formed within the end of the opposing hinge member, as shown in Fig. 15. After applying the members 33 to the inner ends of the hinge members 13, the sections of the box can be readily assembled by forcing the hinge member 16 between the hinge members 13, at which time the central portions of the members 33 will take into the recesses 35 of the ends of the hinge member 16, the retaining members at this time becoming slightly compressed due to their resiliency, said retaining members rotating with the section 10 of the box when it is moved to open position and serving as pivotal means as well as means for retaining the sections in proper hinged relation.

In the modification shown in Fig. 16 the opposing ends of the hinge members 13 and 16 are substantially in abutting relation, except where they are recessed to receive the dish-shaped retaining disk 36 which preferably lies partly within each of the recesses as shown. The retaining disk 36 is preferably formed of resilient material and is slightly compressed or flattened when assembling the box sections by forcing the hinge member 16 of one section into position between the hinge members 13 of the other section, the resistance offered by the retaining members serving to hold the sections in proper hinged relation one relative to another.

It will be understood that the retaining devices interposed between the hinge members of the box sections are provided primarily for the purpose of maintaining the sections in proper assembled relation but that said devices may also constitute pivotal or centering means between the opposing ends of the hinge members, formed integrally with the sections of the box. However, the construction of the two sections of the box is such that pivotal means, other than the cooperating hinge members and grooves of the box sections within which the hinge members operate may be dispensed with so long as means is provided for retaining the sections in assembled relation. This is true for the reason that the hinge members and grooves are cylindrical or substantially cylindrical in shape and are coaxially disposed, thus permitting the sections to swing freely one upon another. In other words, any means interposed between the ends of the hinge members 13 and 16, or otherwise applied to the sections, which will prevent lateral displacement of one section upon another and without interfering with the swinging movements of one section relative to another will answer the purpose. The preferred means for accomplishing this result is that shown, which embodies the idea of providing means between the ends of the hinge members which will frictionally or otherwise engage the same to prevent lateral displacement of one section relative to another without interfering with the hinging movements of the sections.

In each of the embodiments shown the retaining devices which are applied to the ends of the hinge members before assembling the sections one upon another may be secured to said ends by any suitable means or in any preferred manner, as by embedding portions of the retaining members within the material of the hinge members before it has had time to harden, or by cementing the retaining devices in position upon the ends of the hinge members, or securing them by frictional engagement with said ends, or otherwise as preferred.

It will be noted that in a box constructed in accordance with the present invention that there are no unsightly parts projecting within or from the box, this not being true of previously constructed boxes of this type. As a matter of fact all of the metal or applied hinge parts are concealed within the material of the box, with the result that the box, whether viewed from the interior or the exterior, will have the appearance of being constructed of two parts only, namely, the top and bottom sections. This is advantageous or desirable in boxes of the present type which are supposed to be made as neat and attractive in appearance as possible and therefore free from exposed parts tending to detract from the appearance of the box.

I claim:

1. A box comprising top and bottom sections having alined hinge members provided with opposing end surfaces, and one or more disk-like members interposed between and engaging the opposing end surfaces of said members and cooperating therewith to form a hinge between the sections and to retain the sections in hinged relation one upon another.

2. A box comprising top and bottom sections having alined hinge members with opposing end surfaces having pockets therebetween, and a pair of pivotally associated disk-like members disposed within each of the pockets, said disk-like members cooperating with said hinge members to form a hinge between the sections and to retain the sections in hinged relation one upon another.

3. A box comprising a bottom section having an upstanding rear wall, and a cover section having a rear edge, said wall and rear edge meeting along a hinge line, hinge means along the upper edge of the rear wall of the bottom section having at least a pair of faces fronting in opposite directions, hinge means along the rear edge of the cover section having at least a pair of faces fronting in opposite directions, each of the faces on the bottom section opposing a face on the cover section, and means lying between and bearing against each set of opposing faces for enabling pivotal movement of the sections with respect to each other on said hinge means while holding the sections in assembled relation against movement with respect to each other into any other relationship.

4. A box comprising a bottom section having an upstanding rear wall, and a cover section hav-

ing a rear edge, said wall and rear edge meeting along a hinge line, hinge means along the upper edge of the rear wall of the bottom section having at least a pair of faces fronting in opposite directions, hinge means along the rear edge of the cover section having at least a pair of faces fronting in opposite directions, each of the faces on the bottom section opposing a face on the cover section, and means lying between and bearing against each set of opposing faces for enabling pivotal movement of the sections with respect to each other, said means being anchored to one of said sections and the other of said sections pivoting on said means.

5. A box comprising a bottom section and a cover section, hinge means on the bottom section having a pair of faces fronting in opposite directions, hinge means on the cover section having a pair of faces fronting in opposite directions, each of the faces on the bottom section opposing a face on the cover section, and means comprising one or more resilient disks cooperating with the hinge means on the bottom and cover sections and lying between each set of opposing faces for enabling pivotal relative movement of the sections with respect to each other on said hinge means while holding the sections in assembled relation and against movement with respect to each other into any other relationship.

6. A pintleless hinged box comprising a moulded bottom section and a moulded cover section, solid hinge means integral with the bottom section having a pair of faces fronting in opposite directions, solid hinge means integral with the cover section having a pair of faces fronting in opposite directions, each of the faces on the bottom section opposing a face on the cover section, and retaining means cooperating with the hinge means on the bottom and cover sections and lying between and bearing against each set of opposing faces for enabling pivotal relative movement of the sections with respect to each other on said hinge means while holding the sections in assembled relation and against movement with respect to each other into any other relationship, said hinge means being constructed so as to be capable of being moulded with the box sections without coring.

7. A box comprising a bottom section and a cover section, one of said sections having at least a pair of spaced apart substantially cylindrical hinge elements along one edge thereof and a groove along said edge between said elements, and the other of said sections having at least a pair of spaced apart grooves along one edge thereof and a substantially cylindrical hinge element along said edge between said grooves, the hinge elements and grooves in said sections being constructed and arranged so as to mate with each other to form a hinge when the box is assembled, the hinge elements on said sections having faces opposing each other so that the sections are retained against any substantial lateral movement with respect to each other, and means interposed between said faces for holding the sections assembled with respect to each other while enabling their relative pivotal movement.

8. A box comprising a bottom section and a cover section, one of said sections having at least a pair of spaced apart substantially cylindrical hinge elements along one edge thereof and a groove along said edge between said elements, and the other of said sections having at least a pair of spaced apart grooves along one edge thereof and a substantially cylindrical hinge element along said edge between said grooves, the hinge elements and grooves in said sections being constructed and arranged so as to mate with each other to form a hinge when the box is assembled, the hinge elements on said sections having faces opposing each other so that the sections are retained against any substantial lateral movement with respect to each other, and resilient means cooperating with the hinge elements on the bottom and cover sections and interposed between said faces for holding the sections assembled with respect to each other while enabling their relative pivotal movement.

9. A box comprising a bottom section and a cover section, one of said sections having at least a pair of spaced apart hinge elements along one edge thereof and a recess along said edge between said elements, and the other of said sections having at least a pair of spaced recesses along one edge thereof and a hinge element along said edge between said recesses, said hinge elements and recesses in said sections being constructed and arranged so as to mate with each other to form a hinge when the box is assembled, the hinge elements on said sections having faces opposing each other so that the sections are retained against any substantial lateral movement with respect to each other, and one or more disk-like members interposed between and engaging said opposing faces and cooperating therewith to form a hinge between the sections and to retain the sections in hinged relation with one another.

10. A box comprising a bottom section and a cover section, one of said sections having at least a pair of spaced apart substantially cylindrical hinge elements along one edge thereof and a groove along said edge between said elements, and the other of said sections having at least a pair of spaced apart grooves along one edge thereof and a substantially cylindrical hinge element along said edge between said grooves, the hinge elements and grooves in said sections being constructed and arranged so as to mate with each other to form a hinge when the box is assembled, the hinge elements on said sections having faces opposing each other so that the sections are retained against any substantial lateral movement with respect to each other, and a pair of pivotally associated disk-like members disposed between said opposed faces, said disk-like members cooperating with said hinge elements to form a hinge between the sections and to retain the sections in hinged relation one with another.

11. A pintleless hinged box comprising a moulded bottom section and a moulded cover section, one of said sections having at least a pair of spaced apart solid substantially cylindrical hinge elements along one edge thereof and a groove along said edge between said elements, and the other of said sections having at least a pair of spaced apart grooves along one edge thereof and a substantially cylindrical hinge element along said edge between said grooves, said hinge elements and grooves being capable of being moulded without coring integral with said sections and being constructed and arranged so as to mate with each other to form a hinge when the box is assembled, the hinge elements having faces opposing each other so that the sections are retained against any substantial lateral movement with respect to each other, and means interposed between said faces and cooperating with the hinge elements on the bottom and cover sections for holding the sections assembled with respect to

each other while enabling their relative pivotal movement.

12. A box comprising a bottom section and a cover section, one of said sections having at least a pair of spaced apart hinge elements along one edge thereof and an intervening recess between said elements, and the other of said sections having at least a pair of recessed portions along one edge thereof and a hinge element along said edge between said recesses, the hinge elements and recesses in said sections being constructed and arranged so as to mate with each other to form a hinge when the box is assembled, the hinge elements on said sections having faces opposing each other so that the sections are retained against any substantial lateral movement with respect to each other, and means lying between each set of opposing faces for enabling free pivotal movement of the sections with respect to each other while holding the sections in assembled relation, each of said means at least for the most part being thin in the plane of the faces so that the opposing faces are closely adjacent each other and each of said means also being anchored with respect to one of said faces and the other of said faces pivoting on said means.

13. A box comprising a bottom section and a cover section, one of said sections having at least a pair of spaced hinged elements along one edge thereof and an intervening recess between said elements and the other of said sections having at least a pair of recessed portions along one edge thereof and a hinge element along said edge between said recesses, said hinge elements and recesses in said sections being constructed and arranged so as to mate with each other to form a hinge when the box is assembled, the hinge elements on said sections having at least two sets of opposing faces arranged so that the sections are retained against any substantial movement with respect to each other in a direction parallel to the hinge line, one face of each set of opposing faces having a recess of slight extent in a direction along the hinge line and being coincident therewith, and a device thin in the plane of the faces interposed between each set of opposing faces, each of said devices being anchored with respect to one of said faces and having a small protuberance fitted into the recess of the opposing face.

14. A box comprising a bottom section having a rear edge and a cover section having a rear edge, said edges meeting along a hinge line, hinge means along the edge of the bottom section having at least a pair of faces fronting in opposite directions, hinge means along the edge of the cover section having at least a pair of faces fronting in opposite directions, each of the faces on the bottom section opposing a face on the cover section, said hinge means being substantially continuous along the meeting edges so that no intervening space exists between the edges along the hinge line either when the box is open or closed, and means lying between and bearing against each set of opposing faces for enabling pivotal movement of the sections with respect to each other on said hinge means while holding the sections in assembled relation against movement with respect to each other into any other relationship.

WILLIAM J. HISCOCK.