Sept. 13, 1932. M. PARTIOT 1,877,039

HINGED BOX AND METHOD OF ASSEMBLY

Filed April 26, 1930

Fig. 1.

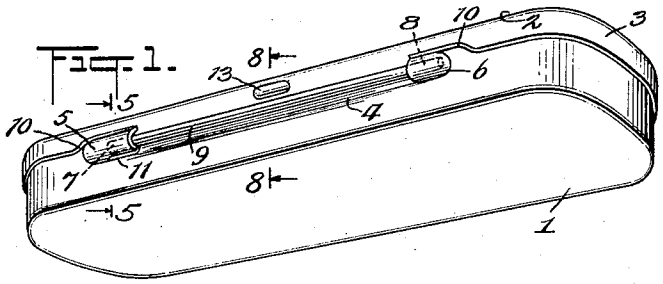


Fig. 5.

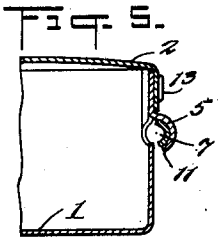


Fig. 2.

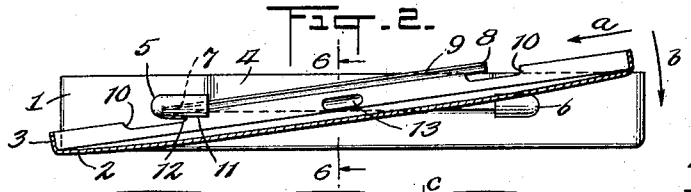


Fig. 6.

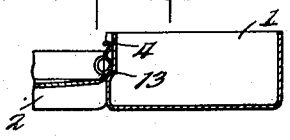


Fig. 3.

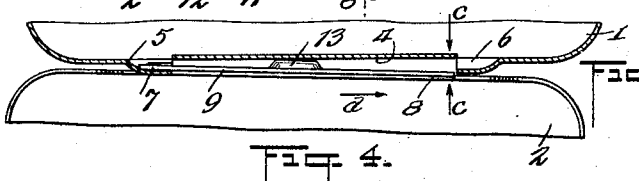


Fig. 7.

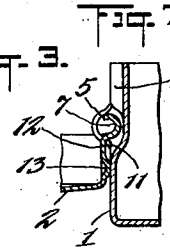


Fig. 8.

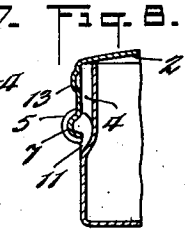


Fig. 4.

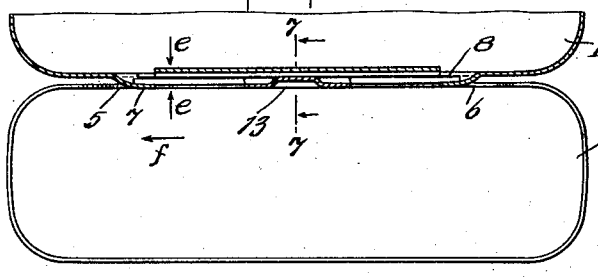


Fig. 18.

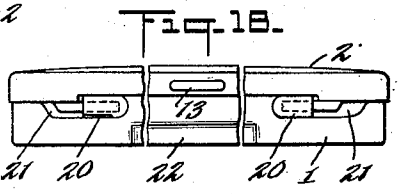


Fig. 9.

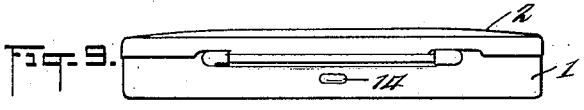


Fig. 10.

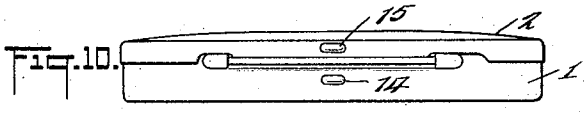


Fig. 15. Fig. 16. Fig. 17.

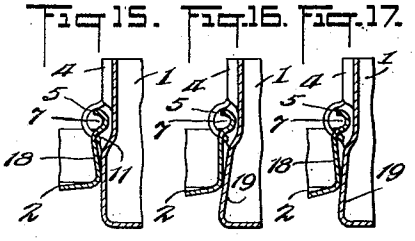


Fig. 11.

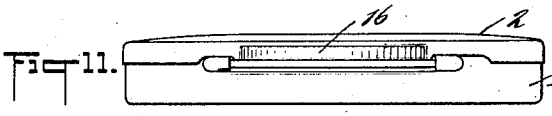


Fig. 12.

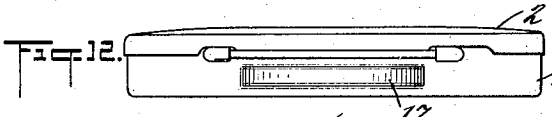


Fig. 14.

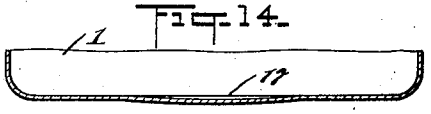
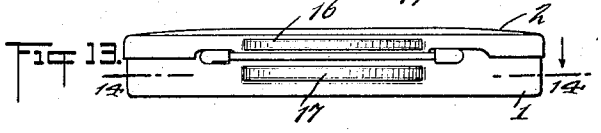


Fig. 13.



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UNITED STATES PATENT OFFICE

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HINGED BOX AND METHOD OF ASSEMBLY

Application filed April 26, 1930. Serial No. 447,488.

This invention relates to hinged boxes of the type disclosed in my application Serial No. 422,033, filed January 20, 1930, of which this application is a continuation in part.

The principal object of the invention is to form complete hinge parts on a box and cover and to assemble same by a simple motion which instantly locks the parts together without any further operation and prevents them from coming apart accidentally even after prolonged use.

Another object of the invention is to provide a box of this type having a raised portion on the box or cover, or both, which will prevent the cooperating parts of the hinge from assuming a position where they might accidentally come apart when the cover is open.

The hinge disclosed in my prior application is preferably formed by stamping out a pair of spaced bulbular hinge knuckles on the box, and by cutting out and curling the metal along one edge of the cover to provide oppositely extending hinge pintles. One hinge knuckle has a longitudinal slot cut about half-way through it from its open end. The parts are assembled by inverting the cover and inserting one of the hinge pintles in the slotted knuckle on the box portion so that the edge adjacent this pintle slips into the slot in said knuckle. This telescoping action permits the opposite hinge pintle to register with the opening in the other knuckle and to be inserted therein by a slight canting movement which locks the hinge parts together without any further bending or other operation.

Hinged boxes of this type are uniformly successful in operation and do not come apart when subjected to ordinary usage. In some cases, however, either through rough handling or repeated opening and closing of the cover over long periods of time the parts may become bent in such a way that the pintles will slip out of the hinge knuckles and permit the cover to drop off the box. According to the present invention I provide a raised portion on the box or cover, or on both the box and cover, which will limit the opening movement of the cover just enough to prevent the hinge pintles from assuming a position where they might accidentally slip out of the hinge knuckles when the cover is open. This raised portion may be formed at the time the hinges are formed and hence requires no extra operation.

The invention will be described in connection with certain preferred embodiments shown in the accompanying drawing, in which:

Fig. 1 is a perspective view of the assembled box showing the position of the hinges and raised portion with the cover closed;

Fig. 2 is a rear view of the box with the cover in section, showing the first steps in securing the cover to the box;

Fig. 3 is a fragmentary plan view showing the final step in securing the cover to the box;

Fig. 4 is a similar view showing the box assembled with the cover in open position;

Fig. 5 is a fragmentary section on the line 5—5 of Fig. 1, showing the hinge pintle on the cover inside the slotted knuckle on the box;

Fig. 6 is a fragmentary section taken on the line 6—6 of Fig. 2;

Fig. 7 is a fragmentary section on the line 7—7 of Fig. 4, showing the position of the raised portion with the attached cover in open position;

Fig. 8 is a fragmentary section on the line 8—8 of Fig. 1, showing the position of the parts with the cover closed;

Figs. 9 to 13, inclusive, are rear views showing modified constructions and arrangements of raised portions intermediate the hinges;

Fig. 14 is a longitudinal section taken on the line 14—14 of Fig. 13;

Figs. 15 to 17, inclusive, are transverse sections showing further modifications of the invention; and

Fig. 18 is a rear view showing still another modification of the invention.

The box shown in Fig. 1 comprises a cup-shaped box portion 1 of any desired shape, preferably made of thin sheet metal, and a cover 2 having the usual flange 3 adapted to

overlap the edge of the box when in closed position.

The rear wall of the box portion is stamped to provide a central depression 4 and hinge knuckles 5 and 6, respectively, on opposite sides of said depression to receive oppositely extending hinge pintles 7 and 8 on the cover. The hinge knuckles 5 and 6 are in the form of raised bulbs having open ends facing each other, and their remaining sides closed and merging into the box portion. One of these knuckles is preferably longer than the other, the knuckle 5 here being shown about twice as long as the knuckle 6.

The flange 3 of the cover has a central section 9 slightly higher than the rest of the flange and in the same general location as the depression 4 in the box portion. The hinge pintles 7 and 8 are preferably formed by undercutting the opposite ends of this raised section at 10 so that the pintles partially overhang the recesses or cut-out portions 10. The metal coextensive with the pintles 7 and 8 is then fluted inwardly of the cover to form a continuous ridge of substantially semicircular cross section which will pivot in the depression 4 of the box portion after the cover is attached.

A slot 11 is cut lengthwise in the metal preferably at the bottom of the elongated hinge knuckle 5 and transverse to the opening in the end of said knuckle, and is just wide enough to receive the single thickness of thin flat metal 12 at the inner edge of the recess 10 immediately below the hinge pintle 7. The slot 11 preferably extends about half the length of the knuckle 5 and hence does not impair the strength or rigidity of the knuckle.

I also form a raised portion 13 in the rear flange 3 of the cover which, in the form shown in Figs. 1–8, is located midway between the pintles 7 and 8 and extends outwardly so that it will strike against the rear wall of the box portion 1 when the cover is open. The raised portion 13 may be stamped in the metal at the time the pintles are formed and hence requires no extra forming operation.

In order to assemble the cover on the box portion the parts may be held as shown in Fig. 2 with the cover inverted so that when the pintle 7 is slipped into the knuckle 5 the edge of the flat metal 12 under the pintle will be exactly in line with the slot 11. With the parts in this position, the cover is moved longitudinally in the direction of the arrow *a* in Fig. 2, engaging the pintle 7 in the knuckle 5 and guiding the flat edge 12 telescopically into the slot 11 until it strikes against the edge of said slot as shown in Fig. 2. In this position the raised portion 13 rests in the central depression 4 in the box portion as shown in Fig. 6. With the parts in this limiting position the cover is tipped or canted downwardly as indicated by the arrow *b* in Fig. 2, bringing the cover parallel with the box portion. Fig. 3 is a plan view showing the box and cover in this last position, and it will be evident that the raised portion 13 strikes against the box directly beneath the depression 4, thus causing the right-hand end of the cover to stand out from the box and preventing the pintle 8 from coming into alignment with the knuckle 6.

When the parts are in the position shown in Fig. 3, two motions are necessary to complete the assembly. First the box and cover are pressed together in the direction of the arrows *c* in Fig. 3, bringing the pintle 8 into alignment with the knuckle 6. Secondly, the cover is moved in the direction of the arrow *d* in Fig. 3, causing the pintle 8 to enter the knuckle 6 and at the same time completely withdrawing the flat edge 12 from the slot 11 as shown in Fig. 4. The movement of the parts in the direction of the arrows *c* is very small compared to the total span of the pintles between the two knuckles, and can be made without distorting the hinge. This motion is made possible by the elasticity of the metal transversely to the axis of the hinge.

Figs. 4, 5, 7 and 8 show the box and cover completely assembled. It will be evident, especially in Fig. 7, that the raised portion 13 strikes against the rear wall of the box portion when the cover is open, and thus prevents the edge 12 beneath the pintle 7 from coming into alignment with the slot 11, so that the box and cover can not come apart accidentally. In order to remove the cover from the box, pressure must be applied intentionally in the direction of the arrows *e* in Fig. 4 so as to place the flat metal edge 12 in line with the slot 11, and the cover moved in the direction of the arrow *f*, whereupon the pintle 8 will spring out of the housing 6 as the result of the tension stored up by the pressure *e*.

Fig. 9 shows a modification of the invention in which a raised portion 14 is located in the rear wall of the box portion instead of in the cover. In Fig. 10 I provide a raised portion 14 on the box portion and a raised portion 15 on the cover, and hence each of these raised portions need be only half as high as is the case when only one raised portion is provided. Fig. 11 shows an elongated raised portion 16 on the cover. Fig. 12 shows a similar elongated raised portion 17 on the box. In Figs. 13 and 14 I provide an elongated raised portion 16 on the cover and an elongated raised portion 17 on the box, these portions being stamped in such a way that they blend gradually into the main body of the metal as shown in Fig. 14 and are therefore scarcely noticeable.

In Fig. 15 to 17, inclusive, I also obtain the advantages previously described without any abrupt abutment on either the box or cover. In Fig. 15 the rear wall 18 of the cover is

arranged at a slight angle with the top edge substantially in line with the pintles on the cover so that this edge will strike against the box and prevent the pintle 7 from coming out of the knuckle 5 when the cover is open. In Fig. 16 the rear wall 19 of the box is stamped out at an angle and gives the same result as the construction shown in Fig. 15. In Fig. 17 the rear walls of both the cover and the box are tapered slightly, being a combination of Figs. 15 and 16, and hence the taper can be so slight as to be scarcely noticeable.

Fig. 18 shows a modification of the invention in which the hinge knuckles 20 open outwardly and hinge pintles 21 are turned inwardly toward each other, and in which the raised portion 13 is provided on the cover as previously described. In this form of the invention I provide a central depression 22 at the bottom of the rear wall of the box so that the raised portion 13 may slide therein during the assembling operation. After the parts are assembled, however, the raised portion 13 will strike against the metal above the depression 22 when the cover is open, preventing the parts from separating.

It will be evident that the invention is capable of various other modifications and adaptations not specifically described but included within the scope and spirit of the invention as defined by the appended claims.

The invention claimed is:—

1. A hinged box comprising a section having two hinge pivots adjacent one edge, and another section having two spaced hinge knuckles each with one end open to receive said pivots, one of said knuckles having a slot communicating with its open end to admit the edge of the first section when the adjacent pivot is inserted into said knuckle and thereby permit the second pivot to be fitted into the second knuckle, and means on at least one of said sections to prevent the edge adjacent the first pivot from registering with said slot.

2. A hinged box comprising a section having two hinge pivots adjacent one edge, and another section having two spaced hinge knuckles each with one end open to receive said pivots, one of said knuckles having a slot communicating with its open end to admit the edge of the first section when the adjacent pivot is inserted into said knuckle and thereby permit the second pivot to be fitted into the second knuckle, and a raised portion on at least one section adapted to strike against the other section when the box is open to prevent the edge adjacent the first pivot from registering with said slot.

3. A hinged metal box comprising a section having two projecting hinge knuckles each with one end open, another section having oppositely extending hinge pivots adapted to be inserted in said hinge knuckles and having recesses below said pivots to span the outer faces of said hinge knuckles, a slot extending transversely outwardly from the open end of one hinge knuckle to telescope with the edge of one of said recesses when the adjacent pivot is inserted in the open end of said knuckle, thereby permitting the opposite pivot to be moved longitudinally into the open end of the other hinge knuckle by a relative canting movement between the two box sections to lock both hinge pivots in the respective knuckles, and a raised portion on at least one of said sections adapted to strike against the other section when the box is open to prevent the edge of the aforementioned recess from coming into alignment with the slot in said knuckle.

4. A hinged box comprising a section having two hinge pivots adjacent one edge, and another section having two spaced hinge knuckles each with one end open to receive said pivots, one of said knuckles having a slot communicating with its open end to admit the edge of the first section when the adjacent pivot is inserted into said knuckle and thereby permit the second pivot to be fitted into the second knuckle, and a raised portion on one section intermediate the hinges adapted to limit the opening movement of said sections sufficiently to prevent the edge adjacent the first pivot from registering with said slot.

5. A hinged box comprising a section having two hinge pivots adjacent one edge, and another section having two spaced hinge knuckles each with one end open to receive said pivots, one of said knuckles having a slot communicating with its open end to admit the edge of the first section when the adjacent pivot is inserted into said knuckle and thereby permit the second pivot to be fitted into the second knuckle, and raised portions on each of said sections positioned to strike against each other when the box is open to prevent the edge adjacent the first pivot from registering with said slot.

6. A hinged box comprising a cover having a flexible edge provided with two hinge pintles, a box portion having two projecting hinge knuckles each with one end open to receive said pintles, one of said knuckles having a longitudinal slot communicating with its open end to receive the edge of the cover when the adjacent pintle is inserted in said slotted knuckle and thereby permit the other pintle to be fitted into the other knuckle, and a raised portion on the cover between said pintles lower than the range of flexibility of said flexible edge so as to permit the pintles to be flexed into the knuckles and high enough to strike against the box portion when the cover is open to prevent the edge of the cover adjacent the first pintle from registering with the slot in the cooperating knuckle.

7. A hinged box comprising a section having two hinge pivots on the rear wall, and another section having two spaced hinge

knuckles on the rear wall each with one end open to receive said pivots, one of said knuckles having a slot communicating with its open end to admit the edge of the first section when the adjacent pivot is inserted into said knuckle and thereby permit the second pivot to be fitted into the second knuckle, the rear wall of at least one section being tapered to strike against the rear wall of the other section and prevent the edge adjacent the first pivot from registering with said slot when the box is open.

Signed at New York, in the county of New York and State of New York, this 24th day of April, A. D. 1930.

MAURICE PARTIOT.