Feb. 27, 1951 H. I. CLAXTON 2,543,437

HINGE LEAF STRUCTURE

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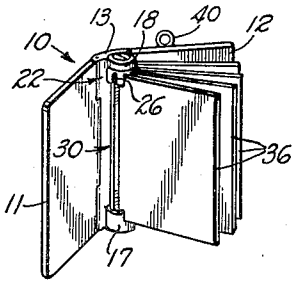


Fig. 1

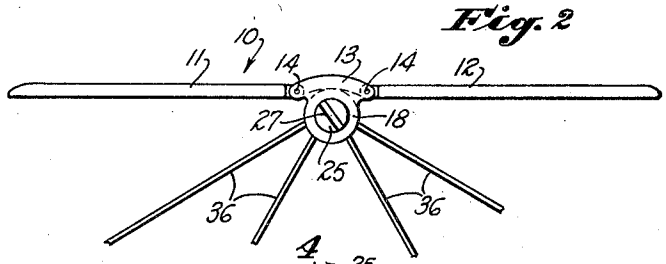


Fig. 2

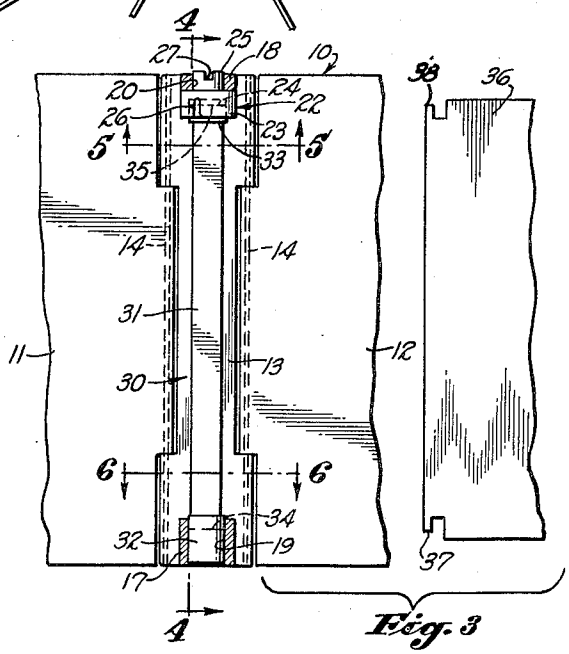


Fig. 3

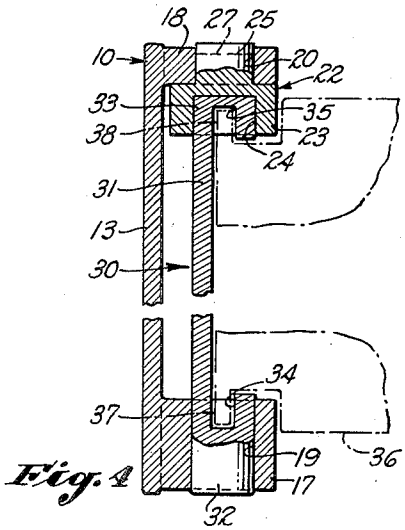


Fig. 4

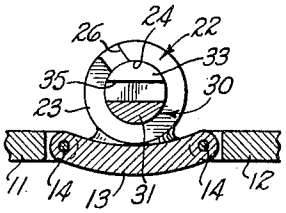


Fig. 5

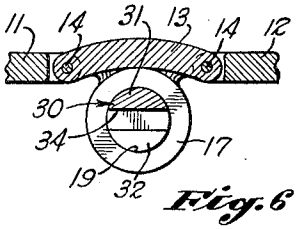


Fig. 6

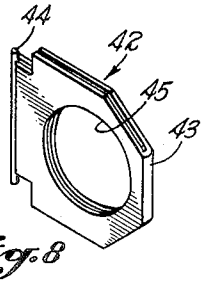
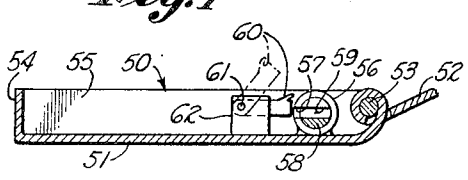


Fig. 8

Fig. 7



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HINGE LEAF STRUCTURE

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15 Claims. (Cl. 40—102)

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My invention relates generally to hinged leaf structures and particularly to a structure in which a plurality of leaves are mounted for relative pivotal movement. The invention has particular utility when applied to multiple leaf office filing devices, map cases, lockets and other devices wherein it is desirable to hingedly connect a plurality of elements in a manner such that the elements can be selectively added to or removed from the assembly.

One object of the invention is to provide a multiple leaf device in which the leaves can be quickly and conveniently applied to and removed therefrom.

Another object is to provide a device, of the character referred to, in which the leaves are retained in hinged relationship without the use of screws or similar removable and adjustable mechanical holding elements so that the insertion and removal of the leaves is greatly expedited and the possibility of misplacing such holding elements is avoided.

Another object is to provide a device of the type indicated which includes an outer assembly composed of a front cover member and a back cover member hingedly connected to the front cover member, the outer assembly being provided with tubular socket means for receiving pintles formed on the leaves, the pintles being adapted to rotate in the sockets to permit pivotal movement of the leaves within the assembly.

Another object is to provide a device of the class referred to in which one of the tubular sockets has a radial re-entrant opening through which the pintles at one end of the leaves can be readily inserted into the socket. A further object in this respect is to provide means for retaining the pintles of the leaves within the sockets, such retaining means being simple in construction and conveniently operated. In one embodiment of the invention, the retaining means consists of a movable detent member adapted, when moved to one position, to overlie the re-entrant opening so as to prevent radial displacement of the pintles of the leaves from the socket. In another embodiment, the retaining means is incorporated in the socket member itself, in which case the socket member is rotatably mounted so that after the pintles have been inserted therein the member can be rotated to a position wherein its re-entrant opening is disposed adjacent the outer assembly and thus closed thereby to retain the pintles in the socket member.

Another object is to provide a device in which

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the outer assembly, which serves as a holder for the leaves, may be composed of two or more cover members arranged for relative pivotal movement, the cover members being either planar or of box-like form in which case the leaves are adapted to be nested in and enclosed by the box-like structure.

A further object is to provide a multiple leaf structure which is particularly simple in construction, economical to manufacture and highly efficient in performing its intended function.

Further objects will be apparent from the following description and from the drawing, which is intended for the purpose of illustration only, and in which:

Fig. 1 is a perspective view of a multiple hinged leaf device constructed in accordance with my invention;

Fig. 2 is an enlarged plan view of the same;

Fig. 3 is a composite elevational view of the central hinge portion of the device and the pivotal end of a leaf;

Fig. 4 is a vertical sectional view, taken on line 4—4 of Fig. 3;

Fig. 5 is a cross-sectional view, taken on line 5—5 of Fig. 3;

Fig. 6 is a cross-sectional view, taken on line 6—6 of Fig. 3;

Fig. 7 is a fragmentary transverse sectional view through a multiple hinged leaf device of modified construction; and

Fig. 8 is a perspective view of one form of leaf member adapted for use in the improved devices.

As previously indicated, the present improved multiple hinged leaf device may assume various shapes and sizes and the improved means for pivotally connecting the leaves may be embodied in devices intended for use as card files, map cases and similar devices. The present invention is therefore not to be regarded as limited in this respect. For the purpose of illustration, I prefer to disclose the invention as embodied in a multiple hinge leaf locket, the drawing showing such a device.

Referring first to Figs. 1 through 6, the locket 10 may comprise a front cover member 11, a back cover member 12 and an intermediate connecting member 13. The members 11 and 12 may be in the form of plates and their inner vertical edges are pivotally connected to the vertical edges of the intermediate member 13 by means of hinge pins 14 which extend through holes in hinge ears of the members (Fig. 3). The intermediate member 13 may be either of straight or curved shape in cross section, as desired. The inter-

mediate member 13 is provided at its lower end with an inner tubular ear or socket 17 and at its upper end with an inner bearing ear 18, the socket and ear having respective apertures 19 and 20 which are axially aligned.

A socket member or retainer 22 is adapted to be rotatably mounted at the upper end of the intermediate member 13, the socket member having a cylindrical portion 23 provided with an axial recess or socket 24 and a reduced cylindrical portion 25 adapted for rotation in the aperture 20 of the bearing ear 18. The portion 23 of the retainer member 22 is provided with a radial opening or slot 26 in its peripheral wall, the slot communicating with the socket 24 and providing a re-entrant opening. The upper end of the reduced portion 25 is provided with a screw driver slot 27.

The improved device also includes an elongate holder member 30 which comprises a vertical bar 31 formed with cylindrical portions 32 and 33 at its lower and upper ends, these end portions being offset laterally from the bar. The end portions 32 and 33 are provided with respective diametrical slots 34 and 35 which extend parallel to the plane of the bar 31. The end portions 32 and 33 are of such diameter that they are readily receivable in the respective aperture 19 and socket 24 to adapt them to pivot therein.

The device as thus far described is adapted as a holder or support for a plurality of leaf members 36 which, as shown in Figs. 1 to 4, may consist merely of thin plates. Adjacent the upper and lower inner corners of the members 36, the material is slotted to provide small vertical lower and upper pintles 37 and 38 (Fig. 3). These pintles are adapted to be disposed in the respective slots 34 and 35 of the holder member 30 when the leaf members are pivotally mounted in the device.

To pivotally connect the leaf members 36 to the locket assembly, the parts 11, 12 and 13 are first pivoted to the open position illustrated in the several views, after which the retainer member 22 is assembled thereon. This assembly operation is readily effected by merely inserting the reduced portion 25 of the member 22 into the aperture 20 of the bearing ear 18 as shown in Figs. 3 and 4. After the member 22 has been thus mounted, the holder member 30 is slid upwardly through the aperture 19 and its upper end 33 inserted into the socket or recess 24 of the member 22. A leaf member 36 is then pivotally mounted in the locket 10 by first inserting its lower pintle 37 in the slot 34 of the holder 30 and then passing its upper pintle 38 through the re-entrant opening 26 and into the slot 35, the retainer member 22 being first rotated to a position to align its opening 26 with the slot 35 to permit such insertion of the pintle 38. After the leaf member 36 has been assembled in this manner, additional leaf members can be pivotally connected in a like manner, after which the retainer member 22 is turned to a slight extent to disalign its opening 26 with the slot 35. This operation is easily accomplished by inserting the end of a small screw driver or other tool in the slot 27 and turning the same. The reduced end 25 of the retainer member 22 has a close frictional fit in the aperture 20 so that the member is frictionally held in its positions of rotative adjustment.

It will be noted by reference to Fig. 4 that the lower and upper recessed edges of the leaf members 36 are disposed closely adjacent the socket member 17 and the retainer member 22 so that excessive vertical movement of the leaf members is avoided. Moreover, the leaf members 36 act as spacers between the socket 17 and the member 22 and thus prevent downward movement of the holder member 30. In other words, the holder member 30 and the leaf members 36 retain each other in place in the locket 10. Since the pintles 37 and 38 are loosely held in the slots 34 and 35, the leaf members are freely mounted for pivotal movement and may be swung to various angular positions.

To close the locket 10 it is merely necessary to pivot the cover members 11 and 12 on the hinge pins 14 in the same manner in which the covers of a book are closed. The cover members may be retained in closed position by any suitable detent or latch means, not herein shown. The locket 10 may be suspended from a necklace chain which may pass through a loop 40 one one of the cover members (Fig. 1). The leaf members may be suitably engraved, embossed or otherwise embellished to provide ornamentation. In some instances the leaf members may provide holders for small photographs and in such case I propose to employ leaf members of the holder type shown at 42 in Fig. 8.

The leaf member 42 is designed to support a photograph and is constructed from a single piece of very thin sheet metal. The metal is folded upon itself as indicated at 43, the free ends of the metal being joined, by solder, to a transverse pin 44, the ends of which serve as pintles for pivotally mounting the leaf member in the locket in the manner previously explained. The folded sides of the leaf member 42 have openings 45 through which a photograph slid into position between the sides can be viewed.

When it is desired to remove one or more leaf members 36 or 42 from the locket, the latter is opened and the retainer member 22 is turned to align its re-entrant opening 26 with the slot 35 so as to permit withdrawal of the upper pintle 38 of a leaf member in a lateral direction. As the upper pintle of each leaf member is thus released, the member is tilted and its lower pintle 37 slid out of the lower socket 17 to permit removal of the leaf member.

In Fig. 7 is shown a multiple hinge leaf device 50 of slightly different form. In this alternative structure the cover members 51 and 52 are pivotally connected by a pin 53 and at least one of the members is made in the form of a box having side and end walls 54 and 55. The member 51 is provided with spaced loops 56 adjacent its end walls 55, only one of the loops being herein shown. One loop 56 has a radial re-entrant opening 57. A holder member 58, similar to the member 30 described previously, has its ends disposed in the loops 56 and has transverse slots 59 at its end portions for receiving the pintles of leaf members, the holder member being turned to align its slot with the re-entrant opening 57 to permit such assembly. In order to retain the pintle last inserted in the slot 59, I provide a detent 60 which is pivoted at 61 to a block 62 fastened within the cover member 51. When the detent 60 is pivoted upwardly as indicated by broken lines, the pintle of a leaf member can be inserted or removed through the opening 57. However, when the detent 60 is in the position shown in full lines, its end overlies the opening 59 to close the same and thus retain the pintle in the slot 59. When the leaf members are pivotally connected to the locket 50 in the manner explained above, they can be pivoted downwardly

and nested in the box-like cover member 51, whereafter the cover member 52 can be swung downwardly to close the open side of the member 51 and thus conceal the leaf members.

While the improved device has been herein described as a multiple hinge leaf locket, by way of example, it will be readily understood that the improved hinged leaf structure may be embodied in other articles of jewelry, such as rings, brooches, bracelets, etc., and that similar devices of larger proportions and embodying the present improved pivotal mounting for the leaves are adapted for use as card files, map cases and other holders for various papers, cards, photographs and other thin objects.

I claim as my invention:

1. A hinged leaf structure, comprising: an outer assembly including a front cover member and a back cover member, said members being pivoted relative to each other to adapt them to be pivoted to open and closed positions; first and second socket means at the opposite ends of said assembly, said second socket means having a radial re-entrant opening; an elongate holder member having first and second ends pivotally disposed in the respective first and second socket means, said ends having inner diametrical slots facing each other; and a leaf member detachably mounted between said front and back cover members, said leaf member having pintles at its upper and lower edges, one of said pintles being receivable in said slot of said first end and the other of said pintles being insertable through said re-entrant opening into said slot of said second end.

2. A hinged leaf structure, comprising: an outer assembly including a front cover member and a back cover member, said members being pivoted relative to each other to adapt them to be pivoted to open and closed positions; first and second tubular socket means at the opposite ends of said assembly, said second socket means having a radial re-entrant opening; an elongate holder member including a bar provided with first and second cylindrical ends pivotally disposed in the respective first and second socket means, said ends having inner diametrical slots facing each other; and a leaf member detachably mounted between said front and back cover members, said leaf member having pintles at its upper and lower edges, one of said pintles being receivable in said slot of said first end and the other of said pintles being insertable through said re-entrant opening into said slot of said second end.

3. A hinged leaf structure, comprising: an outer assembly including a front cover member and a back cover member, said members being pivoted relative to each other to adapt them to be pivoted to open and closed positions; first and second tubular socket means at the opposite ends of said assembly, said second socket means having a radial re-entrant opening; an elongated holder member having first and second ends pivotally disposed in the respective first and second socket means, said ends having inner diametrical slots facing each other, the slot of said second end being adapted to align with said re-entrant opening; a leaf member detachably mounted between said front and back cover members, said leaf member having pintles at its upper and lower edges, one of said pintles being receivable in said slot of said first end and the other of said pintles being insertable through said re-entrant opening into said slot of said second end; and means for releasably retaining said pintles in their respective sockets.

4. A hinged leaf structure, comprising: an outer assembly including a front cover member and a back cover member, said members being pivoted relative to each other to adapt them to be pivoted to open and closed positions; first and second tubular socket means at the opposite ends of said assembly, said second socket means having a radial re-entrant opening; an elongate holder member including a bar provided with first and second cylindrical ends pivotally disposed in the respective first and second socket means, said ends having inner diametrical slots facing each other, the slot of said second end being adapted to align with said re-entrant opening; a leaf member detachably mounted between said front and back cover members, said leaf member having pintles at its upper and lower edges, one of said pintles being receivable in said slot of said first end and the other of said pintles being insertable through said re-entrant opening into said slot of said second end; and means for closing said re-entrant opening to retain said other of said pintles in said slot of said second end.

5. A hinged leaf structure, comprising: an outer assembly including a front cover member and a back cover member, said members being pivoted relative to each other to adapt them to be pivoted to open and closed positions; first and second socket means at the opposite ends of said assembly, said second socket means having a radial re-entrant opening; an elongate holder member having first and second ends pivotally disposed in the respective first and second socket means, said ends having inner diametrical slots facing each other; and a plurality of leaf members detachably mounted between said front and back cover members, each of said leaf members having pintles at its upper and lower edges, one of said pintles being receivable in said slot of said first end and the other of said pintles being insertable through said re-entrant opening into said slot of said second end.

6. A hinged leaf structure, comprising: an outer assembly including a front cover member and a back cover member, said members being pivoted relative to each other to adapt them to be pivoted to open and closed positions; first and second tubular socket means at the lower and upper ends of one of said cover members, said second socket means having a radial re-entrant opening; an elongate holder member having first and second ends pivotally disposed in the respective first and second socket means, said ends having inner diametrical slots facing each other; and at least one leaf member detachably mounted between said front and back cover members, said leaf member having pintles at its upper and lower edges, one of said pintles being receivable in said slot of said first end and the other of said pintles being insertable through said re-entrant opening into said slot of said second end.

7. A hinged leaf structure, comprising: an outer assembly including a front cover member, a back member and an intermediate member disposed between said front and back members, said members being pivotally connected; first and second tubular socket means at the opposite ends of said intermediate member, said second socket means having a radial re-entrant opening; an elongate holder member having first and second ends pivotally disposed in the respective first and second

socket means, said ends having inner diametrical slots facing each other; and at least one leaf member detachably mounted between said front and back cover members, said leaf member having pintles at its upper and lower edges, one of said pintles being receivable in said slot of said first end and the other of said pintles being insertable through said re-entrant opening into said slot of said second end.

8. A hinged leaf structure, comprising: an outer assembly including a front cover member, a back cover member, said members being pivoted relative to each other; a first tubular socket means at one end of said assembly; a bearing member at the opposite end of said assembly; a retainer member rotatable in said bearing member and having a circular wall defining a second socket means, said second socket means having a radial re-entrant opening; an elongate holder member having first and second cylindrical ends pivotally disposed in the respective first and second socket means, said ends having inner diametrical slots facing each other; and at least one leaf member detachably mounted between said front and back cover members, said leaf member having pintles at its upper and lower edges, one of said pintles being receivable in said slot of said first end and the other of said pintles being insertable through said re-entrant opening into said slot of said second end, said retainer member being rotatable to a position wherein its circular wall overlies the ends of the slot of said second end of said holder member so as to retain said second end of said leaf member therein.

9. A hinged leaf structure as defined in claim 8 in which said retainer member is frictionally engaged in said bearing member so that rotation thereof is resisted.

10. A hinged leaf structure as defined in claim 8 in which said retainer member is frictionally engaged in said bearing member and has means for facilitating manual rotation thereof.

11. A hinged leaf structure as defined in claim 1 in which said leaf member has edge portions disposed adjacent and adapted to engage the inner ends of said socket means to retain said leaf member within said assembly.

12. A hinged leaf structure as defined in claim 4 in which said closing means comprises a detent member movably mounted on one of said cover members and adapted to be moved to one position to overlie said re-entrant opening and to another position to uncover the same.

13. A hinged leaf structure as defined in claim 4 in which said closing means comprises a detent member pivotally mounted on one of said cover members and adapted to be pivoted to one position to overlie said re-entrant opening and to another position to uncover the same.

14. A hinged leaf structure as defined in claim 8 in which said retainer member has a reduced end rotatable in said bearing member, said reduced end having a screw driver slot therein by which said retainer member can be rotated.

15. A hinged leaf structure, comprising: an outer assembly including a front cover member and a back cover member, said members being pivoted relative to each other to adapt them to be pivoted to open and closed positions; an elongate holder member having its ends pivotally mounted within said outer assembly adjacent the pivotal connection between said front and back cover members, said ends having inner diametrical slots facing each other; a leaf member detachably mounted between said front and back cover members, said leaf member having pintles at its opposite edges, said pintles being receivable in said slots of said ends of said elongate holder member; stationary means at one end of said outer assemby overlying said slot at one end of said holder member for retaining one of said pintles inserted therein; and movable retaining means at the other end of said outer assembly and movable to a first position to expose an end of said slot at the other end of said holder member to allow insertion of the other of said pintles therein, said retaining means being movable to a second position to overlie said end of said slot so as to retain said other of said pintles therein.

HARRY I. CLAXTON.

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