

- [54] **ROUND FURNITURE RECESS LOCK**  
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 70/79, 81, 85, 100, 125, 129, 134, DIG. 78,  
 DIG. 19

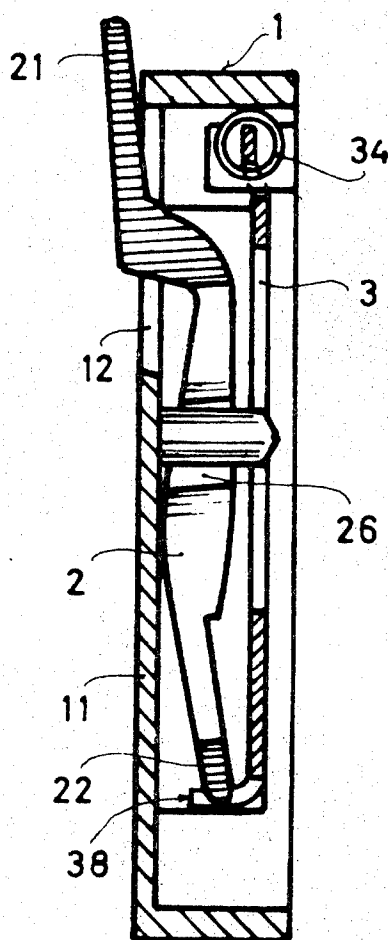
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*Attorney, Agent, or Firm*—Allison C. Collard

[57] **ABSTRACT**

A lock for recessing into an article of furniture which is responsive to a key consisting of a housing having a latch opening formed on its back side, a lid having an opening to receive the key for closing the housing, a latching bolt slidably disposed in said housing having an extending front latch portion offset from the plane of the bolt in the direction of the back of the housing for movement through the opening of said housing, a spring-loaded lock tumbler disposed in said housing and engaging said latching bolt for defining the lock and unlock positions of said bolt, so that when the key is inserted in the housing and rotated, it engages the latch bolt to move the offset front portion out of the housing latch opening in order to lock the furniture article.

**9 Claims, 20 Drawing Figures**



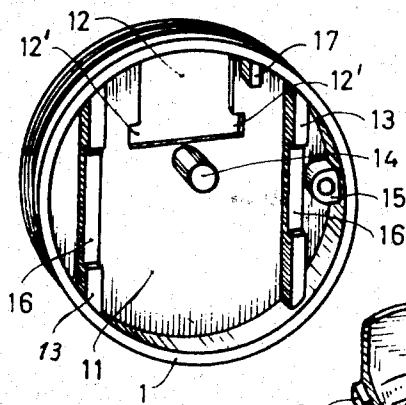


Fig. 1a

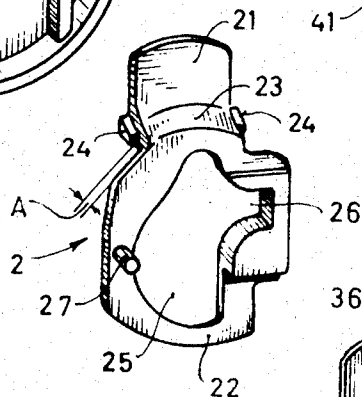


Fig. 1b

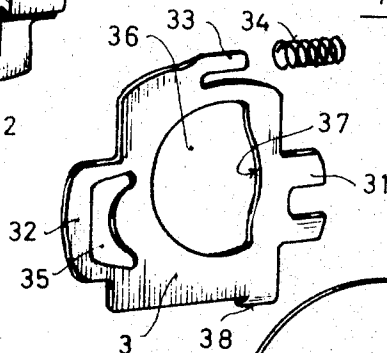


Fig. 1c

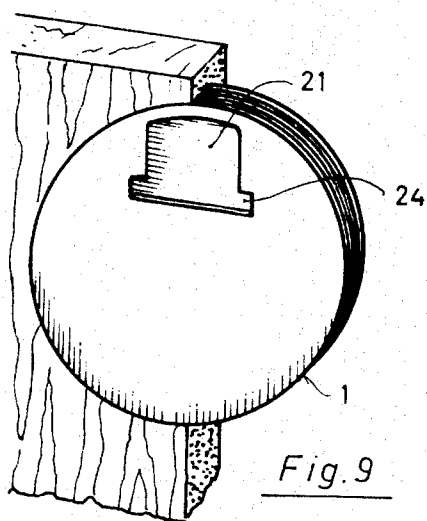


Fig. 9

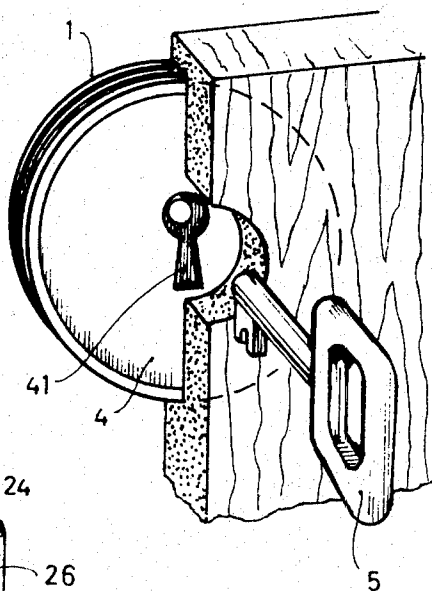


Fig. 10

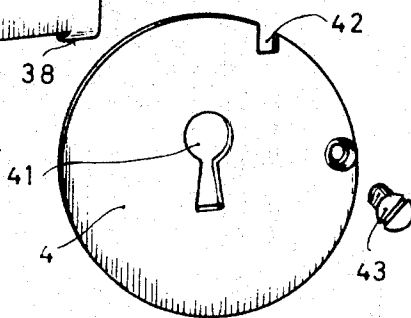
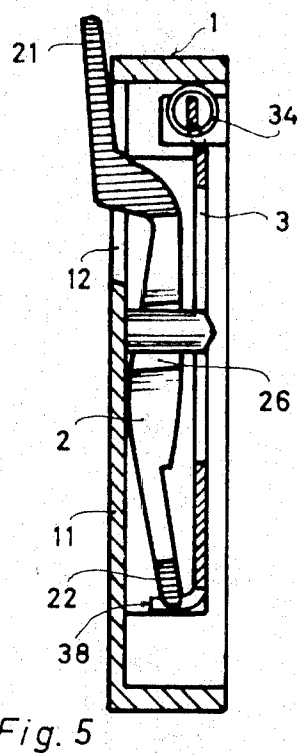
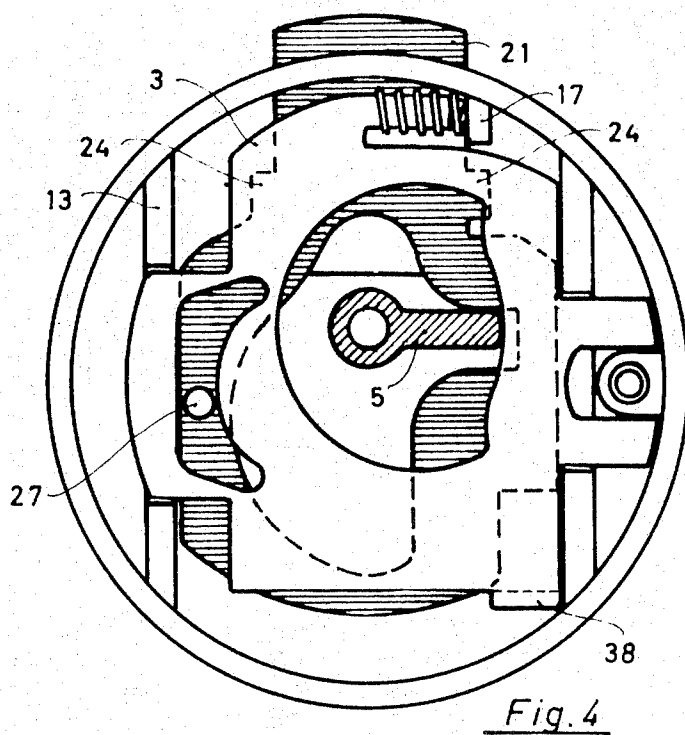
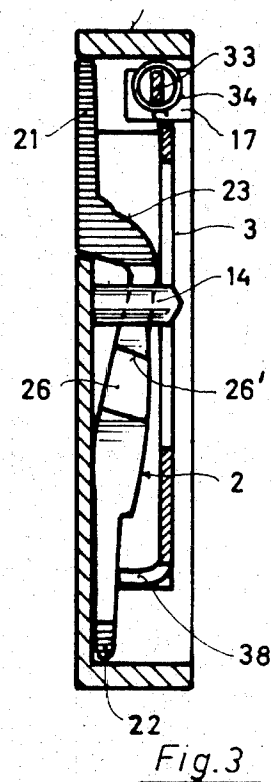
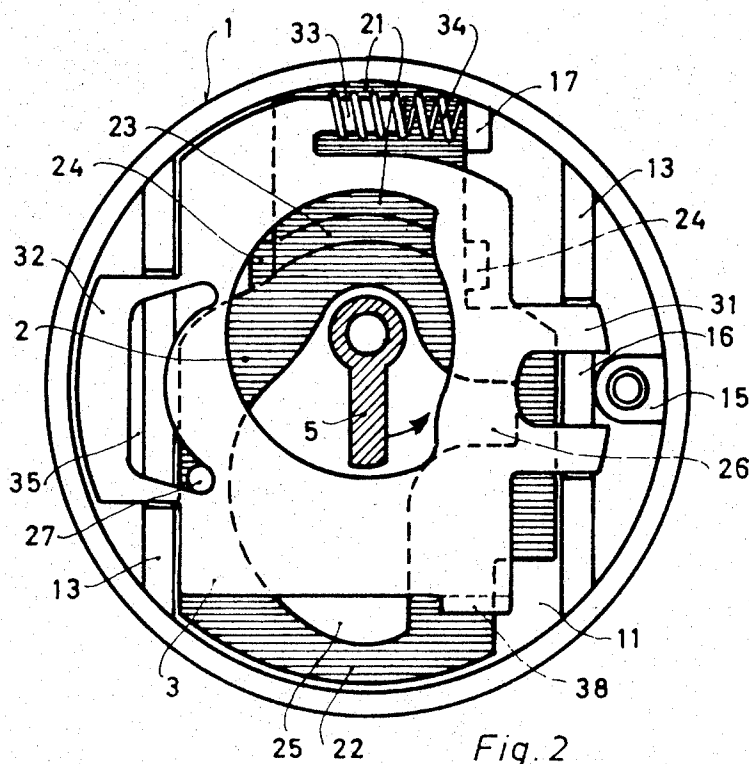


Fig. 1d

Fig. 1



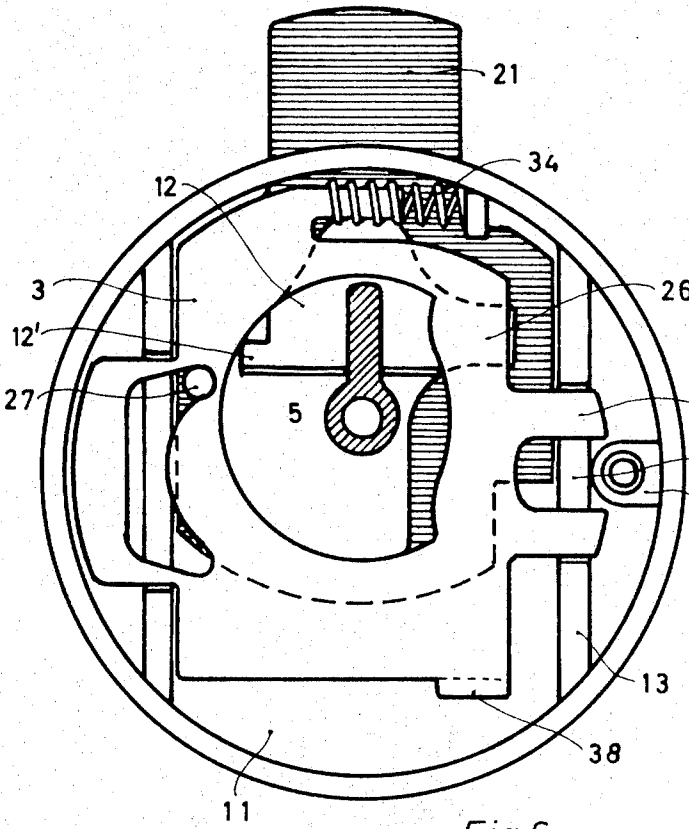


Fig. 6

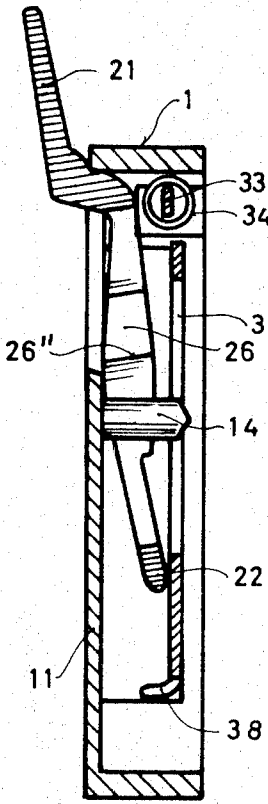


Fig. 7

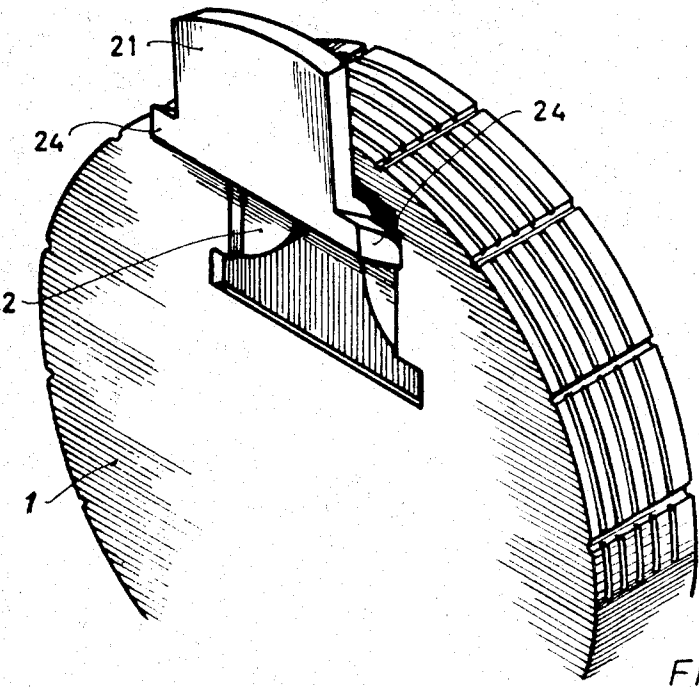
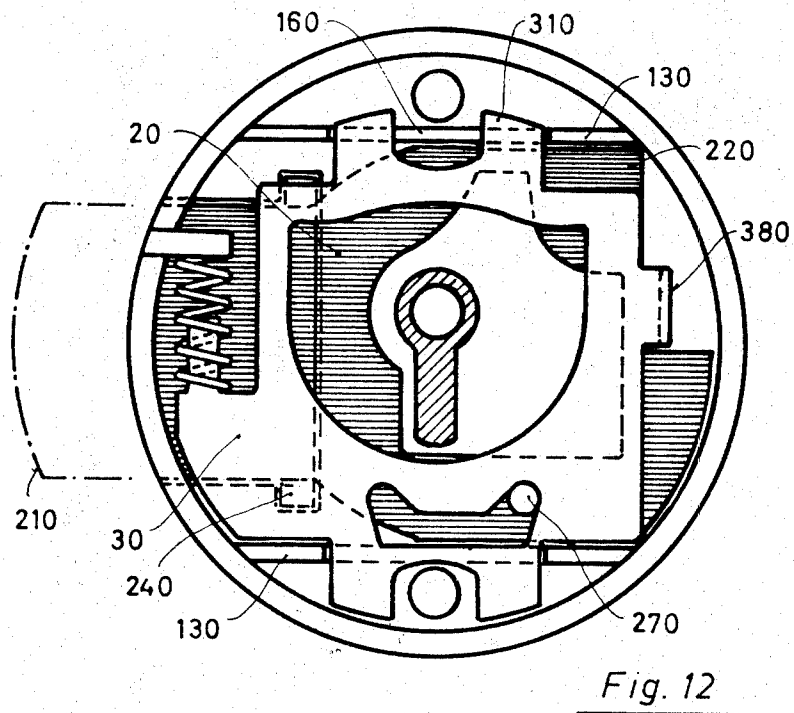
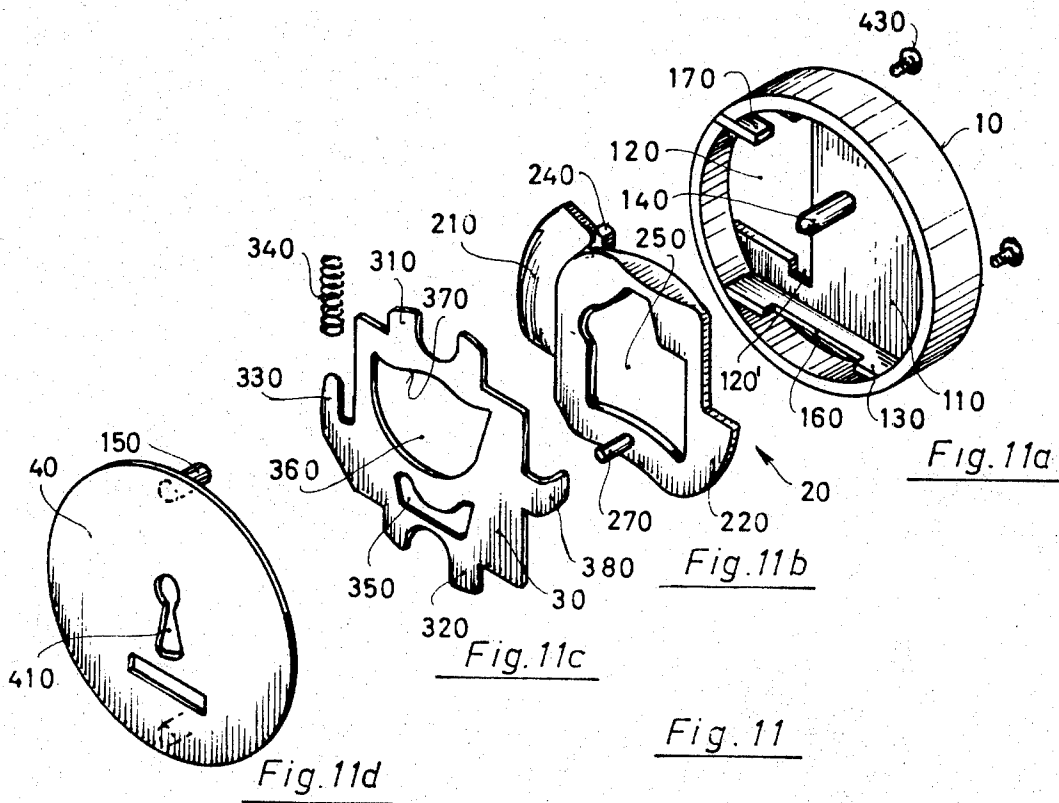


Fig. 8



## ROUND FURNITURE RECESS LOCK

This invention relates to a round, recessed lock for furniture, consisting of a lock housing provided with a lid, a spring loaded tumbler and a latch bolt. In its initial position, the bolt sinks into the bottom of the lock. During the latching portion, the bolt is guided out of the bottom opening of the lock housing in response to the turning of the key.

Furniture locks are generally inserted, in the sides of furniture doors, flaps, drawers and the like, and only to a very limited degree because of the relatively great expenditure of labor. Instead, box locks are surface mounted on the rear side of the cupboard door which, although substantially simpler to assemble, are, however, unsightly due to their projecting lock boxes and obstructive appearance. These surface mounted box locks however, can not be used as flap closures of writing bureaus, for example, since the inner sides of the flaps, in their folded down state, serve as a writing surface, and should, accordingly, be shaped to be planar. For this special field of application, round recess locks have been developed, having a bottom which is flush with the rear flap side in a parallel plane.

A conventional round lock is provided with a round insertion opening, in which a pin enters during the transition into the locked position of the flap so as to displace a groove extending transversely to its access. The latch bolt can then pivot to engage the lock. With this lock construction, a very accurate adjustment is required to prevent the pin from hitting the edge of the housing bottom. Accurate adjustment is also required when the upper horizontal wall carrying the pin serving as a counter bearing due to excessive loading has settled or been bent.

Other conventional round recess locks are constructed as cylinder locks and possess a latching bolt recess to be sunk into the lock bottom. Such furniture locks possess different disadvantages. First of all, the height of the lock determined by construction of the cylinder lock is greater than the wall thickness of conventional furniture flaps so that there is a relatively great projection on the visible side of the furniture. Moreover, special cylinder keys must be used which, in practice, is disadvantageous, since the buyer prefers to exchange the individual keys of one or more pieces of furniture with one another. It is further disadvantageous of these known furniture locks, that the latch bolt can only be swivelled, when it has been pushed out of its recessed seating by pressure correspondingly exerted by the key. Finally, it has been found to be disadvantageous that the key can only be withdrawn when the bolt is disposed in the latched position.

The conventional furniture lock constructed as a cylinder lock, can still be operated by a conventional furniture key, which does not have to be pressed into the lock to start the latching process. The lock includes a helically ascending glide surface provided within the cylinder. This construction, however, requires very long lock length so that the housing part projecting on the visual side of the furniture plate is enormously great. A more significant disadvantage in these locks is their relatively laborious and costly production. As determined by the production, the key can also, in the case of this furniture recess lock, be withdrawn only in the latched position of the latching bolt, so that there are particular difficulties in storing and packing the

lock. Moreover, in most cases, the latching bolt can only be moved about its known axis.

In recognition of the disadvantages of conventional furniture locks, the task of the present invention is to create a round furniture recess lock of extremely low assembled height, inexpensive in cost, operable with a customary furniture key, and having a bolt which is linearly movable over the periphery of the lock housing, so that the key can be withdrawn in a latched as well as in an unlatched position.

The bolt is constructed like a rocker, having a bend extending transverse to its direction of motion guided on the lock bottom, and linearly movable over the periphery of the housing box. The latching portion, guideable out of the lock housing, is offset relative to the inner bolt portion by the thickness of the bottom wall. The latching portion in the zig-zag shaped transition region has lateral material projections which engage in the recesses of true contours of the lock bottom. The projections and the edges of the bottom opening are in the direction of movement of the bolt having opposed chamfers.

The novel lock can be constructed to be disc-shaped and have a maximum height of merely 10 mm, so that it can be inserted even in the thinnest woods, which are used for door or flap levers. The lock bottom also extends in a plane parallel to the inner side of the door leaf. The bend provided in the latch portion guided within the lock housing makes it possible for the bolt, acted upon by the key bit and set into linear motion, to be guided out of the bottom opening by its notched portion, while the other end of the bolt swivels in the direction of the housing lid or, on reverse motion, of the housing bottom. This measure in connection with the run-up ramp of the cam-shaped material projections of the bolt permit the lock to function reliably with an extreme flat construction.

In a further development of the invention, the bolt is guided on a linear path of movement by webs bordering it laterally, and arranged perpendicular on the lock bottom. The webs possess elongated recesses open at an edge, in which is guided the plate-shaped tumbler lying on the latch bolt and displaceable transversely thereto. The rectilinear motion of the latching bolt is further supported by the cam-shaped material projections, which glide along on the outer side of the lock bottom at the edge region of the recesses. According to a further feature of the invention, the latch portion, guideable out of the lock housing by the cam-shaped projections provided at its base, has a T-shape which corresponds to the bottom opening. Within the inner bolt portion is a curve-shaped recess in which the key bit engages, wherein the edge portion (end region) of the recess directly acted upon by the key bit, possesses a wall thickness about double that of the remaining region of the bolt. Finally, the tumbler, at the end region remote from the arm, possesses a bent-over lug directed to the bolt.

In the drawings wherein similar reference numerals denote similar elements throughout the several views:

FIG. 1 shows a round recess lock according to the invention in exploded representation by the partial FIGS. 1a to 1d;

FIG. 2 is an enlarged scale view of the fully assembled lock according to FIG. 1 with the omission of the housing lid;

FIG. 3 is a vertical sectional view through the lock according to FIG. 2;

FIGS. 4 and 5 show the lock according to FIGS. 2 and 3 after a key rotation of 90°;

FIGS. 6 and 7 show the lock according to FIGS. 2 and 3, or 4 and 5 respectively after a key rotation of 180°;

FIG. 8 is a perspective view of the lock according to FIGS. 1 to 7 with a view of the outer lock bottom with the latching bolt displaced in the latched position;

FIG. 9 shows the lock inserted in the swivel flap of a piece of furniture viewed in the direction of the latching bolt;

FIG. 10 is a view of the inserted lock seen in the direction of the key opening;

FIG. 11 shows a modified embodiment of a furniture lock according to the invention in exploded representation with partial FIGS. 11a to 11d, and;

FIG. 12 shows in an enlarged scale, the fully assembled lock according to FIG. 11 with the omission of the housing lid.

The partial FIG. 1a shows a lock box 1, having a back or bottom 11 with an opening 12, two perpendicularly oriented webs 13 as well as a guide pin 14. A boss 15 having a threaded bore is provided for securing a housing lid 4 (FIG. 1d), when the lid is not to be locked by means of a clip closure. Webs 13 display elongated recesses 16 open at an edge.

FIG. 1b shows a latching bolt 2, which is disposed in housing bottom 11. A front latching portion 21, i.e., extends out of bottom opening 12 while bolt portion 22 sits in the interior of the lock. Bolt portion 22 is bent, as may be seen from FIGS. 3, 5 and 7, so that latch bolt 2 is constructed as a rocker. Portion 21 of bolt 2 is offset relative to portion 22 by the wall thickness of lock bottom 11, so that the outer side of latch portion 21 is flush with the outer bottom side of lock housing 1 in the open position of the lock. The transition region 23 from bolt portion 21 to bolt portion 22 rises steeply, to form a zig-zag shaped transition. Shaped laterally on to this transition are cam-shaped projections 24, the dimensions of which correspond to the lateral enlargements 12' of the recess of bottom opening 12. Projections 24 possess front and rear inclined ramps, which are adapted to the chamfers of the edges of openings 12', these slopes serving as glide surfaces, which aid the exit or entry of bolt 2 from or into the bearing seating of lock bottom 11. Between projections 24 and bolt portion 22 is a spacing "A," which is somewhat greater than the wall thickness of housing bottom 11, so as to serve as a guide groove between projections 24 and bolt portion 22.

Tumbler 3 in FIG. 1c is a flat, plate-shaped disc, which, in the assembled lock, comes to rest on the latching bolt. Lateral projections 31 and 32 are guided in recesses 16 of webs 13 (FIG. 1a). A slightly bent arm 33 of the tumbler receives a compression spring 34, which is supported against a projection 17 provided in the lock housing. Projection 31 of tumbler 3 is formed to be fork-shaped, so that it will not abut against boss 15. In the range of projection 32, the tumbler includes an approximately U-shaped guide groove 35 in which routing pin 27 of the latch bolt glides. Tumbler 3 has a curve-shaped aperture 36 for engaging the key bit. During the locking movement of the key, the key bit engages at edge 37 of the hole and pushes tumbler 3 to one side against the force of compression spring 34, so

that routing pin 27, seated in one of the U-arms of opening 35, can move up or down. At the side remote from the arm 33, the tumbler includes a nose 38, directed downwardly to the bolt, which releases or locks the bolt.

FIG. 1d shows a disc-shaped housing lid 4 with a key-hole opening 41, and a lateral recess 42 for receiving abutment 17 to fix the lid into position. In this embodiment, housing lid 4 is fastened to lock housing 1 by a counter sunk screw 43. It is equally possible to secure the lid by undercut projections.

FIGS. 2 and 3 show the fully assembled lock in the unlocked state with housing lid 4 removed, and with a key 5 shown in cross-section and inserted over guide pin 14. The parts lying over one another in the lock housing are clearly distinguished by horizontal hatching. The inner portion 22, remote from the latching portion 21 of the latching bolt, rests on the housing bottom in a planar parallel manner. If key 5 is then rotated in the direction of the arrow, then the key bit engages the upper region of wall 26' of the aperture, since this wall, in this position of the latching bolt, is designed to be slightly slanted. In combination with the run-up ramps of material porjections 24, and the bend lying further back, an adequate tilting motion is exerted upon the bolt, which effects an emerging or dipping of bolt head 21 out of, or in to the lock bottom 11, respectively.

If key 5 is rotated in the direction of the arrow, then the key bit initially engages tumbler 3 at the edge 37 of the hole and pushes this to the right (in the drawing), so that pin 27 is released. In a short moment, the key bit then engages at wall 26' of the hole with the effect of tipping bolt 2 and displacing it radially, respectively. Due to the leverage of the key bit, and the wedged surfaces of cam-shaped projections 24, bolt 2 then easily glides out of its bearing seating in the housing bottom. FIGS. 4 and 5 show the position assumed by the lock elements after a 90° rotational movement of the key. After the key is rotated 180°, the lock is latched as shown in FIGS. 6 and 7. In FIG. 7, bolt 2 is now tilted about its bend, so that the inner portion of the bolt, opposite to latching portion 21, points in the direction of the housing lid and pin 27 has notched into the base of the other U-arm of the guide groove 35. During the unlatching process the reverse process takes place, where the key bit engages the upper edge of inclined wall 26'' of the hole, so that the bolt is tipped about the location of its bend.

The lock of the invention is easily inserted in pieces of furniture, as indicated in FIGS. 9 and 10. Only one stepped drill is required to form the recess bore for receiving the lock. The penetrating keyhole bore can also be provided in one operating step. The lock can then be pressed into the bore. It is not necessary to retain the lock by means of screws or the like since as shown in FIG. 5, the outer housing envelope is provided with circumferentially and co-axially extending riflings, grooves, flutes, beads or the like. Of particular advantage is the extremely low assembly depth of the novel lock so that the lock can be fully insertable even with particularly thin walls.

The lock shown in FIGS. 1 to 8 is intended for application with flaps in writing bureaus or the like, or for use where a vertically latch bolt motion is demanded with a vertically orientated keyhole. The lock of the invention can also be applied as a cupboard door lock,

where the doors are pivoted about a vertical axis, with the employment of the same or only slightly modified basic elements. An example of this embodiment is shown in FIGS. 11, 11a to 11d and 12. In this embodiment, the bolt is transversely orientated with respect to the keyhole, so that the guide pin for the key is displaced relative to the prior example. For simplicity, the reference numerals of the embodiment of FIGS. 11 and 12 have been chosen in accordance with FIGS. 1 to 10 and been made different merely by a "0" appended in each numeral.

While only a few embodiments of the present invention have been shown and described, it will be obvious to those persons skilled in the art that many changes and modifications may be made thereunto without departing from the spirit and scope of the invention.

What is claimed is:

1. A lock for recessing into an article of furniture and responsive to a key comprising:

a housing having a latch opening formed in a portion of its back side;

a lid for closing the front opening of the housing, said lid including a key-receiving opening;

a latching bolt slidably disposed in said housing having an extending latch portion offset from the plane of said bolt in the direction of the back of the housing for movement through the latch opening of said housing; and

a spring loaded lock tumbler disposed in said housing and engaging said latching bolt for defining the locked and unlocked positions of said bolt, so that when the key is inserted in the housing and rotated, the key engages the latching bolt to move the offset latch portion upward and rearward out of the housing latch opening to lock the furniture article.

2. The lock as defined in claim 1, wherein the extending latch portion additionally comprises lateral projections disposed on each side thereof for engaging the edges of said housing latch opening to guide said ex-

tending portion out of said opening.

3. The lock as recited in claim 2, wherein said housing latch opening includes enlarged openings for slidably receiving said projections.

4. The lock as recited in claim 1, wherein the back portion of said housing further comprises webs spaced apart and disposed parallel within said housing for guiding said bolt on a linear path of movement.

5. The lock as recited in claim 4, wherein said webs include elongated recesses and said tumbler includes lateral projections on each side for insertion into said web recesses so that said tumbler is transversely displaceable within said web recesses of said housing.

6. The lock as recited in claim 1, wherein said projections of the extending portion of said latch forms a T-shape member, and said housing latch opening is correspondingly T-shaped along its bottom opening so that said latch projections initially move through the T-shape opening in said housing and then are guided along the edges of the narrow portion of the opening as the bolt moves to its locking position.

7. The lock as recited in claim 1, wherein said bolt additionally comprises a curve-shaped recess formed within the body of said bolt for engaging the key, said recess including an edge portion having an enlarged thickness with respect to that of the bolt for engaging the key bit.

8. The lock as recited in claim 1, wherein said tumbler comprises a bent-over lug directed toward the lower portion of said bolt.

9. The lock as recited in claim 1, wherein said latching bolt comprises a routing pin secured perpendicular with respect to the plane of said bolt, and said tumbler comprises a guide slot for engaging said routing pin, said slot including two recessed areas at opposite ends for defining the locked and unlocked positions of said bolt.

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