A. C. GRUNWALD.

LOCKING MECHANISM FOR CLOSURES.

APPLICATION FILED MAR. 23, 1914.

1,201,174. Patented Oct. 10, 1916.

Fig. 1.

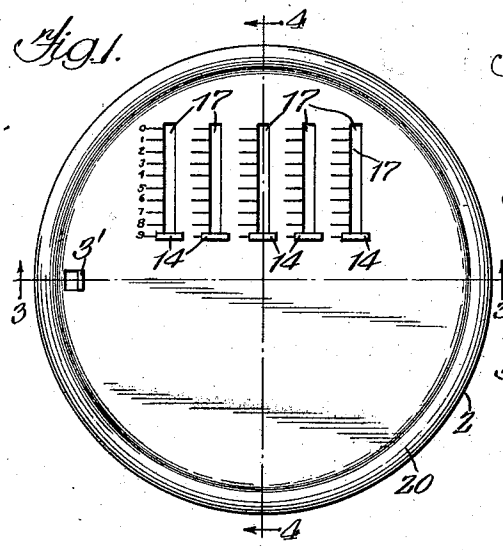


Fig. 2.

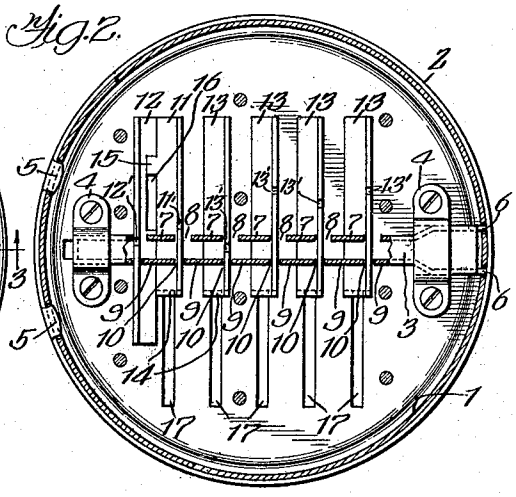


Fig. 3.

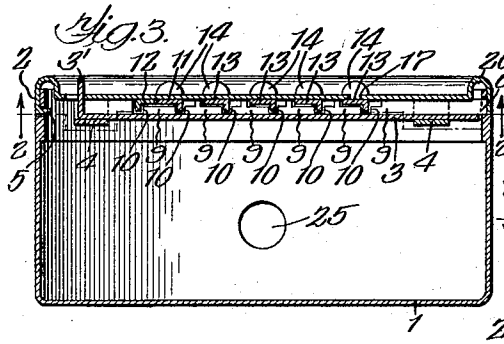


Fig. 4.

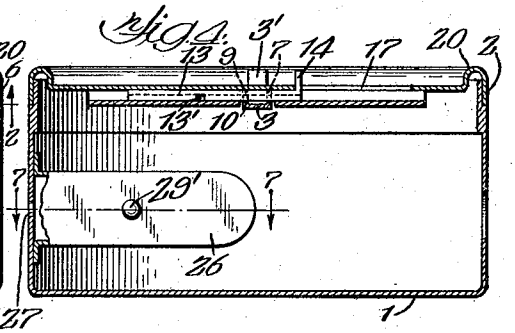


Fig. 5.

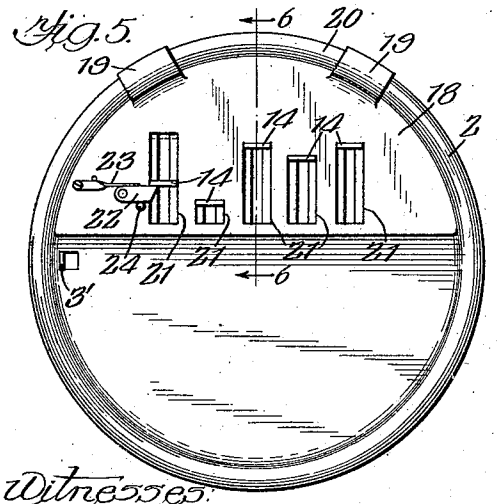
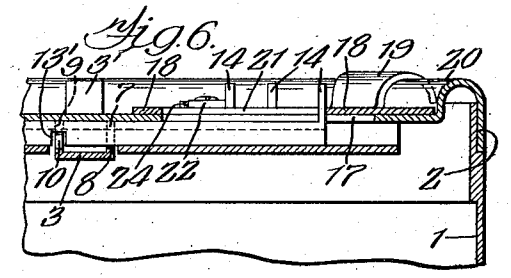


Fig. 6.



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UNITED STATES PATENT OFFICE.

ALBERT C. GRUNWALD, OF CHICAGO, ILLINOIS, ASSIGNOR TO PRECISION METAL WORKERS, A FIRM COMPOSED OF ALBERT C. GRUNWALD AND CARL E. CARLSON, OF CHICAGO, ILLINOIS.

LOCKING MECHANISM FOR CLOSURES.

1,201,174. Specification of Letters Patent. Patented Oct. 10, 1916.

Application filed March 23, 1914. Serial No. 826,512.

To all whom it may concern:

Be it known that I, ALBERT C. GRUNWALD, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Locking Mechanism for Closures, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to locking mechanism for closures and is of particular service in the construction of portable savings banks, though it is not to be limited to such an embodiment.

The invention has for one of its objects the provision of an unlocking combination tumbler or tumblers that are directly accessible for the purpose of enabling them to be manipulated and which are supplemented by an additional combination tumbler which is operable through the intermediation of one or the other tumblers and constitutes what I term an intermediate combination tumbler.

The invention has for another of its objects the provision of a gage for determining the extent to which the combination tumblers may be manipulated in order to work the combination without the necessity of remembering the combination or having reference to a memorandum thereof. Moreover by means of this gage the speed and the positiveness with which the combination may be worked are materially increased.

My invention will be fully described by reference to various features thereof shown in preferred forms by the accompanying drawings in which—

Figure 1 is a plan view of a structure equipped in accordance with my invention; Fig. 2 is a bottom view of the structure on line 2 2 of Fig. 3; Fig. 3 is a sectional view on line 3 3 of Fig. 1; Fig. 4 is a sectional view on line 4 4 of Fig. 1; Fig. 5 is a view similar to Fig. 1 illustrating a slide motion limiting device which may be employed as an aid in working the combination; and Fig. 6 is a sectional elevation on line 6 6 of Fig. 5.

Like parts are indicated by similar characters of reference throughout the different figures.

The closure illustrated is one that happens to be embodied in the form of a savings bank having a body portion 1 and a cover portion 2 which is adapted to be locked into engagement with the body portion by means of a locking bolt 3 guarded in its movement by clips 4 secured to the bottom of the cover, the locking bolt having a finger 3^1 projecting through a slot in the cover for convenience in effecting its movement. This locking bolt is reciprocable in substantially a straight line. One means for locking the cover upon the body may include a pair of insetting ears 5 upon the cover which are adapted to be received within correspondingly disposed recesses in the cylindrical wall of the body as illustrated clearly in Figs. 2 and 3. The end of the locking bolt 3 opposite the ears 5 is provided with two separated projections 6 that are receivable within correspondingly disposed openings in the cylindrical wall of the body 1 as indicated in Fig. 2. When the locking bolt 3 is moved sufficiently to the left to clear the projections or lugs 6 from engagement with the body 1 the cover may readily be removed, as will be apparent, but when the locking bolt occupies the position illustrated in Fig. 2 the cover is securely locked in place. The locking bolt is desirably in the form of a channel, when viewed in cross section (Fig. 6), one of the right or vertically disposed walls 7 of the channel having a series of notches 8 while the other channel wall 9 has a series of notches 10. Combination tumblers 11, 12, 13 are mounted to reciprocate in straight lines substantially at right angles to the direction of movement of the locking bolt 3, these combination tumblers being desirably of small angle iron formation when viewed in cross section (Fig. 3). The vertical sides of the combination tumblers are provided respectively with notches 11^1, 12^1, 13^1 that are to be brought in alinement with the channel wall 9 of the locking bolt when said bolt is to be shifted. Each combination tumbler, excepting tumbler 12, is provided with an upwardly projecting finger 14 integrally formed therewith, which fingers are to be engaged in adjusting the notches in the combination tumblers in alinement with the channel wall 9 of the locking bolt 3. When such alinement has been effected

the locking bolt 3 may be shifted from the position illustrated in Fig. 2 since the notches 8 in the bolt 3 are sufficiently long to permit of the proper movement of the locking bolt 3 for the purpose of bringing its lugs or projections 6 out of engagement with the cylindrical body 1.

The combination tumbler 12 is what I term an intermediate combination tumbler and has no finger 14 in fixed relation thereto but does have lost motion engagement with the tumbler 11, such motion being effected, for example, by means of a lug 15 upon the tumbler 11 working within a recess 16 in the tumbler 12. Remembering that the lower portion of Fig. 2 corresponds to the upper portion of Fig. 1, the fingers 14 are moved upwardly to bring the notches in the combination tumblers in alinement with the wall 9 of the locking bolt 3. The notches in the combination tumblers are spaced apart varying distances from the finger 14 so that differing degrees of movement of the combination tumblers are required to bring their notches into proper alinement with the locking bolt 3. The lost motion connection between the combination tumblers 11 and 12 is such as to require a predetermined upward movement of the tumbler 11 before the tumbler 12 is actuated whereafter this movement is continued sufficiently to bring the notch 12^1 in the tumbler 12 into alinement with the channel wall 9. When this movement is completed the notch 11^1 in the combination tumbler 11 is out of alinement with the channel wall 9, a predetermined return in the downward movement of the tumbler 11 being required to bring the notch 11^1 into alinement with the channel wall 9. This return movement of the tumbler 11 is sufficiently short as not to bring about a reëngagement of the lug 15 with the tumbler 12 whereby the alinement of the notch 12^1 in the tumbler 12, which was previously established, is not disturbed.

The differences in the spacings between the notches in the combination tumblers and the fingers 14 are in multiples of a unit of measurement, nine such units of measurement being marked off in Fig. 1. One who knows the unlocking combination will shift the fingers 14 in the slots 17 in the cover 2 to those varying positions which will bring the notches in the combination tumblers in proper alinement with the locking bolt, the finger 14 belonging to the tumbler 11 operating through the intermediation of the lug 15 to bring the notch 12^1 into alinement with the locking bolt wall 9 as hitherto described. All the fingers 14 excepting this finger are allowed to remain in the positions to which they have been adjusted, but this particular finger that belongs to the tumbler 11 is returned until the notch 11^1 is brought into alinement with the wall 9. In order to avoid the necessity of remembering or referring to the locking combination the person authorized to open the closure may be provided with a gage 18 for limiting the extents to which the fingers 14 may be moved. This gage may be of the form illustrated in Fig. 5 where it is shown as being provided with a pair of curved ears 19 that snugly fit the beaded upper rim 20 of the cover 2 and which gage is of a diameter snugly to be inclosed by said rim. The gage is provided with slots 21 equal in number to the fingers 14 which project through said slots, these slots corresponding in length to the movements which the fingers 14 should have in order to bring the notches in their corresponding combination tumblers into alinement with the locking bolt wall 9. The left hand slot 21 of the gage 18 is associated with a tripping lug 22 which is normally moved downwardly by a spring 23 into engagement with a stop lug 24. The tripping lug 22 permits the adjacent finger 14 to move upwardly beyond the same in order that the finger 14 may reach the upper end of the corresponding slot 21 to bring the intermediate tumbler in that position in which its notch 12^1 will register with the locking bolt wall 9, this finger escaping the trip lug 22 in the upward movement of the finger, the tripping lug being restored to the path of the finger 14 by the spring 23 then to limit the extent to which the combination tumblers 11 may be returned, the extent of the return movement being just sufficient to permit the recess 11^1 to be placed in alinement with the wall 9 of the locking bar 3.

While I have herein shown and particularly described the preferred embodiment of my invention I do not wish to be limited to the precise details of construction as changes may readily be made without departing from the spirit of my invention, but

Having thus described my invention I claim as new and desire to secure by Letters Patent the following:—

1. Locking mechanism for closures including a cover to which parts of the locking mechanism are applied; a locking bolt for locking the cover in a closed position; and combination tumblers, one of which lies next to and engages the cover and is provided with a finger that may work in a slot provided in the portion of the cover engaged by said tumblers to permit of the operation of the tumbler having the finger, a portion of the cover margining the slot lying between the tumbler and the finger whereby the finger serves to maintain the tumbler close to said cover portion.

2. Locking mechanism including a locking bolt reciprocable in substantially a straight line; a pair of combination tumblers for preventing or permitting the movement of the bolt reciprocable transversely to the line of

reciprocation of said bolt and in substantially parallel straight lines, one of these tumblers being accessible for operation and having lost motion connection with the other tumbler whereby the first tumbler may adjust the position of the second tumbler and thereafter be adjustable without disturbing the adjustment of the second tumbler to bring both tumblers into position to permit of the operation of the bolt.

In witness whereof, I hereunto subscribe my name this 10th day of March, A. D. 1914.

ALBERT C. GRUNWALD.

Witnesses:

G. L. CRAGG,

ETTA L. WHITE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."