Oct. 14, 1952 H. W. REGENHARDT 2,614,016

INTERLOCKING FILING CABINETS

Filed Feb. 11, 1949 2 SHEETS—SHEET 1

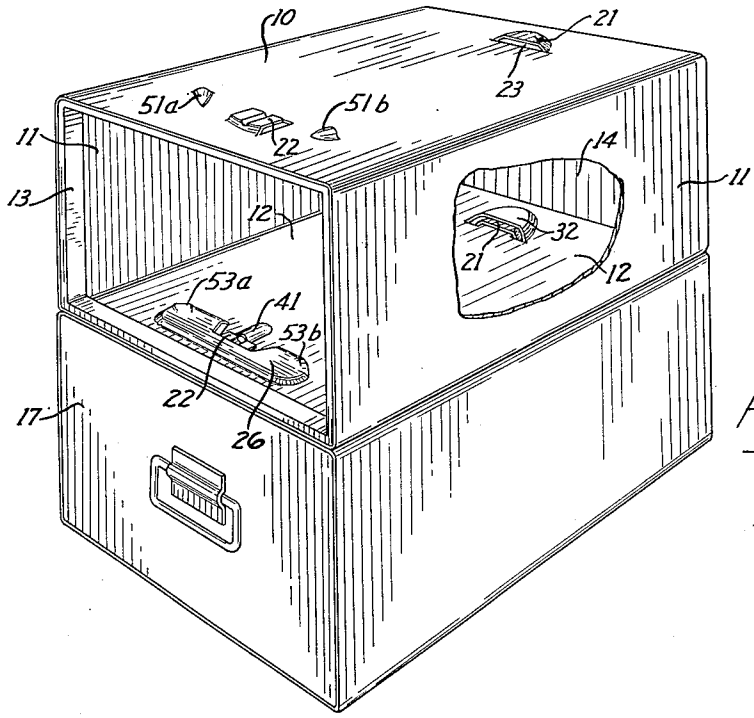


Fig. 1.

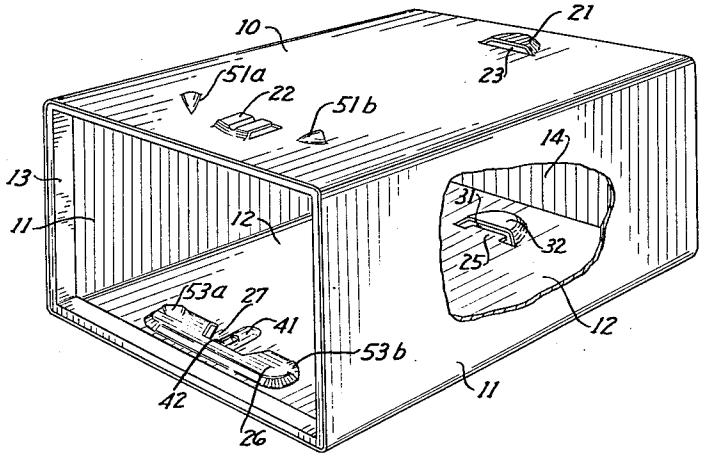


Fig. 2.

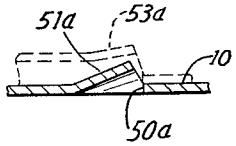


Fig. 9.

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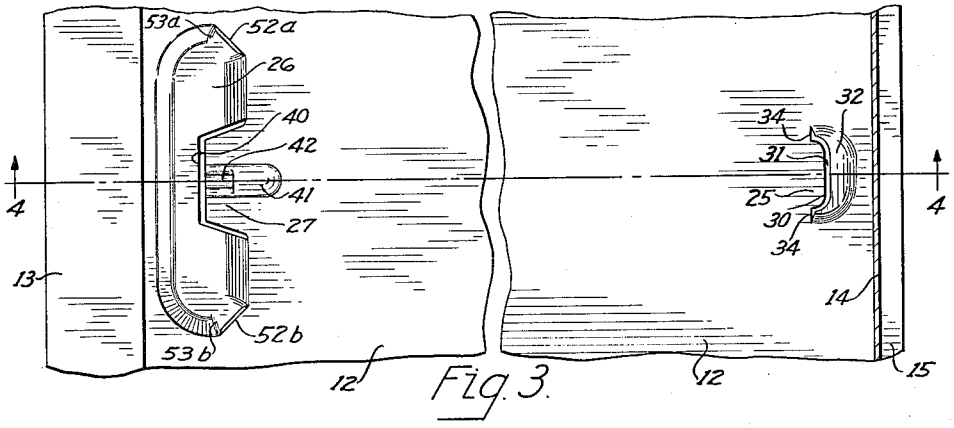


Fig. 3.

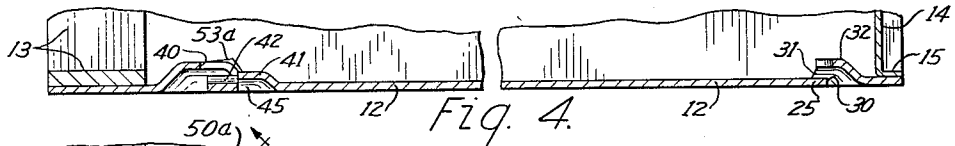


Fig. 4.

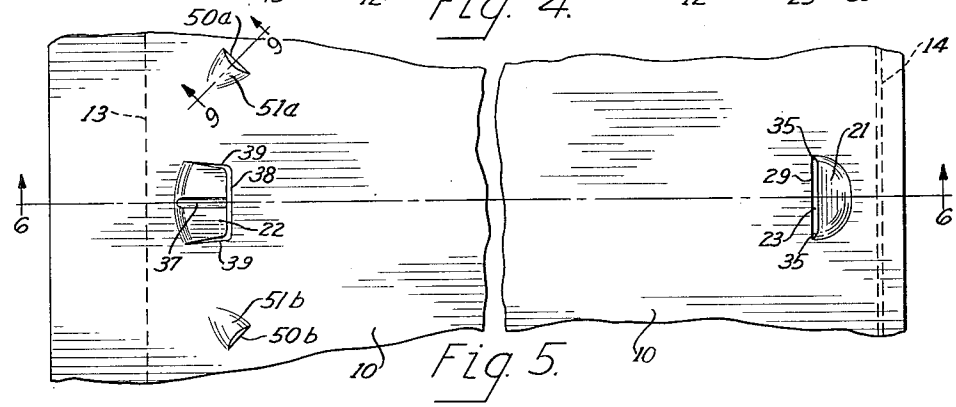


Fig. 5.

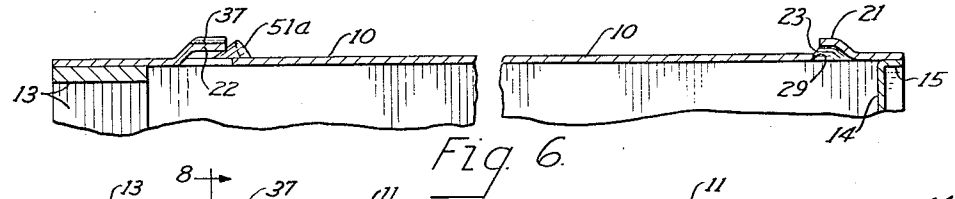


Fig. 6.

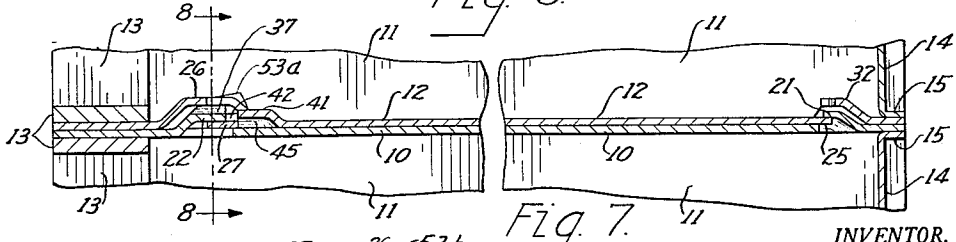


Fig. 7.

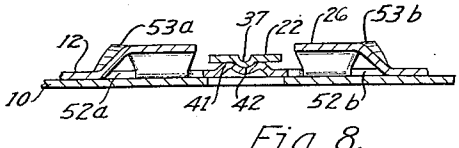


Fig. 8.

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UNITED STATES PATENT OFFICE

2,614,016

INTERLOCKING FILING CABINETS

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Application February 11, 1949, Serial No. 75,817

4 Claims. (Cl. 312—111)

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This invention relates to the combination, construction, arrangement, location, relationship and coaction of parts of an improved interlock for filing cabinets of the nature of that disclosed in prior application Serial No. 703,293, filed October 15, 1946, now Patent No. 2,573,602 of October 30, 1951, in the name of Hans W. Regenhardt.

As in such prior application, a general object of the invention is the provision of individual filing cases, drawers, compartments or the like provided with means whereby two or more such units can be conjugated without requiring any nuts, bolts, keys or other separately formed locking members. Another object is the provision of interlocking filing units in which adjacent units are securely locked against longitudinal and vertical displacement with respect to each other. Another object is the provision of such units which can be manufactured at relatively low cost. Another object is the provision of such units which can be readily interlocked to form a secure and stable stack and which can also be dis-assembled readily. Another object is the provision of such units in which the interlocking parts are formed integrally with the shells of the units, requiring no additional material.

Still another object of the invention is the provision in the interlocking parts of cooperating stops precluding even limited lengthwise displacement of an upper unit relative to a lower unit and all possibility of unintentional traverse of either with respect to the other. Still another object is the provision of a plurality of pairs of stops so constructed and arranged as to require deliberate upward movement of the front or forward end of an upper unit preliminary to disengagement from a lower unit by lateral traverse and, as an incident to subsequent re-engagement, like movement in the opposite direction following traverse of the upper unit into a position permitting such re-engagement. Still another object is the provision of locking means so constructed and arranged as to make possible interchangeability of units equipped with stops of the kind described with other units not so equipped, thereby making it practicable, where necessary, to stack mixed units indiscriminately, without, however, sacrificing all of the advantages of the present invention.

Further objects and advantages of the invention will become apparent from the following description of a preferred form thereof, reference being made to the accompanying drawings in which Figure 1 is a perspective, with part of

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the side wall broken away, showing two units assembled together; Figure 2 is a like perspective of the upper of the two units of Figure 1, the same being structurally similar to but shown as detached from the lower unit; Figure 3 is a plan of the bottom wall of the unit of Figure 2 showing features of the present invention in greater detail; Figure 4 is a longitudinal section through the bottom wall of the upper unit taken along line 4—4 of Figure 3; Figure 5 is a plan of the lower unit; Figure 6 is a longitudinal section through the top of the lower unit taken along line 6—6 of Figure 5; Figure 7 is a longitudinal central section through the top of the lower unit and bottom of the upper unit, the same being assembled in interlocking relation; Figure 8 is a transverse section on line 8—8 of Figure 7, looking in the direction of the arrows; and Figure 9 is a section, looking in the direction of the arrows, taken on line 9—9 of Figure 5.

Briefly, units made according to a preferred form of the invention include parts formed on the top and bottom of each unit arranged to interlock with the bottom and top, respectively, of an adjacent unit. The interlocking parts are disposed adjacent the front and rear portions of the units and include oppositely facing interlocking parts arranged so that when two units are assembled together they cannot be moved longitudinally with respect to each other in either direction, nor can either end of the upper unit be displaced vertically to any great extent with respect to the lower unit. This result is in part accomplished as in prior application No. 703,293, by means of oppositely facing slot-and-tongue assemblies which are arranged so that the tongue adjacent the rear of one unit may be engaged within a slot adjacent the rear of another unit when the longitudinal axes of the units are angularly displaced, after which the units may be interlocked by lifting and rotating the front end of the upper unit about the pivot established by the interengaging slot-and-tongue assembly to bring the longitudinal axes of the units into substantial alignment and thereby bring the interlocking parts adjacent the front ends of the units into locking engagement with each other.

In the invention of said prior application, locking engagement at the rear end of the units is made by relative movement between the units in a generally longitudinal direction and locking engagement at the front end is made by lateral movement effected by swinging one unit with respect to the other to bring their

axes into substantial alignment. The invention of the present application, however, incorporates the cooperating stops previously mentioned as precluding even limited lengthwise displacement of the upper unit and all possibility of unintentional traverse of either unit with respect to the other. The presence of these stops has the effect of modifying the manner in which the locking engagement is effected to the extent that the lateral movement must be accompanied by just enough lifting of the end being swung to avoid interference arising out of the presence of the stops and, following achievement of substantial alignment between upper and lower units, by dropping of the lifted end of the upper unit into contact with the top of the lower unit.

As indicated in Figures 1 and 2, each unit preferably comprises a steel shell having a top wall 10, side walls 11 and a bottom wall 12. The shell is preferably reinforced by a front steel reinforcement 13 and the back of the shell is closed by a rearwardly flanged member 14. The flanges 15 (see Figures 3, 4, 6 and 7) of back 14 may be secured to the shell by spot welding, as may also reinforcement 13. A drawer 17, which may be of conventional construction, is arranged to fit within the shell, the drawer sliding on the reinforcement 13 and suitable drawer stops (not shown) which, with the back of the drawer, function to prevent accidental removal of the drawer from the shell. Obviously, other drawer or compartment arrangements may be employed without affecting the interlocking of the units.

In order to interlock the units into a secure and stable stack such as shown in Figure 1, each shell is provided with interlocking parts on both the top and bottom thereof. Each top wall 10 has a raised portion 21 near the rear thereof formed by displacing some of the metal of the shell upwardly as shown, thereby providing a forwardly facing slot 23. Aligned therewith but near the front of the shell is a rearwardly facing locking member 22, the member 22 projecting a slight distance above the plane of top wall 10. The bottom 12 of each shell is provided with parts adapted to interfit with the parts 21 and 22 of the underlying shell. These parts comprise a rearwardly facing tongue 25 at the rear thereof and, at the front end thereof, a raised portion 26 and forwardly facing tongue 27. As shown in Figure 1 of the drawings, these parts may be interengaged with parts 21 and 22 with tongue 25 disposed within slot 23 beneath the raised portion 21 and the rearwardly facing locking member 22 engaged by forwardly facing tongue 27.

The configuration of the interengaging parts will be described in greater detail below with reference to the remaining figures of the drawings, the construction of the interlocking parts and the interlocking engagement between two adjacent shells being shown in Figures 3 to 8 of the drawings. The interlocking parts provide an assembly in which longitudinal movement of one shell with respect to the other is impossible and in which both ends of the upper shell are locked against vertical movement with respect to the lower shell. These desirable results are accomplished without requiring any separately formed locking members, keys, nuts, bolts or the like.

Considering first the interlock at the rear of the shells, as shown in Figures 5 and 6 a slit 29 is cut in top wall 10 and the metal back of the slit is displaced upwardly to provide the raised portion 21, leaving slot 23. As shown in Figures 3 and 4, the tongue 25 is provided by cutting a slit 30 in the metal of bottom wall 12 and displacing the metal in back of the slit upwardly to form a slot 31 and raised portion 32, thereby providing clearance for raised portion 21 when the shells are assembled. As shown in Figure 7, these parts may be assembled by disposing the upper shell on the lower shell with raised portion 32 over raised portion 21 and then sliding tongue 25 longitudinally into slot 23 so that it is disposed beneath raised portion 21.

When so assembled, the interengagement between tongue 25 and the underside of raised portion 21 prevents the upper shell from being raised to any great extent with respect to the lower shell while the engagement of the shoulders 34 adjacent the tongue 25 with the edge portions 35 of the raised portion 21 prevents movement of the upper shell rearwardly with respect to the lower unit. However, one shell may be swung angularly with respect to the other about the pivot established by the interengagement of raised portion 21 and tongue 25. Thus, these parts may be initially engaged with the axes of the two shells angularly displaced and then one shell may be swung into alignment with the other to engage the locking members near the front of the shells, as described below.

Again referring to Figures 5 and 6, the locking member 22 adjacent the front end of the top wall 10 of the lower shell is struck upwardly from the plane of the top wall 10 and is provided with a central groove 37 which terminates at or near the free edge of locking member 22. The metal of the top is slit as at 38 to permit displacement of the member 22 from the plane of top wall 10 and to provide openings to receive the tongue 27 of the upper unit. It will be noted that slit 38 extends as at 39 toward the front of the cabinet on both sides of locking member 22, which, as will appear below, permits interlocking of two shells to take place by lateral movement of the forward part of one shell with respect to the forward part of the other shell.

To receive locking member 22 of the lower shell, bottom wall 12 (see Figures 3 and 4) of each shell is provided with raised portion 26, the metal of the bottom being slit as at 40 leaving the forwardly projecting tongue 27 disposed substantially in the plane of bottom wall 12. Tongue 27 is provided with a central raised portion 41 having a smaller depression 42 therein. Raised portion 26, which extends on either side of tongue 27, receives the tongue 22 of the top of the lower shell when the parts are assembled with the interlocking parts at the rear of the shells in engagement with each other but with the axes of the shells angularly displaced. Then, when the upper shell is rotated with respect to the lower shell about the pivot established by the interengagement of the interlocking parts 21 and 25, the parts take the position shown in Figures 7 and 8. There it will be seen that the rearwardly projecting locking member 22 of top wall 10 of the lower shell is disposed over the projecting tongue 27 of the bottom 12 of the upper shell with the bottom of the groove 37 engaging within and making a snap fit with groove 42 in raised portion 41 of the tongue 27.

The foregoing structural features and manner of operation are common to the previously mentioned prior application and the present application.

The present invention may and usually will in-

clude, together with these features, at least one pair and preferably a plurality of pairs of cooperating stops, one stop of each pair on the bottom wall of the upper shell and the other stop of each pair on the top wall of the lower shell, by means of which unintentional traverse of either shell with respect to the other is precluded. The stops on the top wall of the lower shell are formed by slitting the metal diagonally as indicated at 50*a* and 50*b* in Figure 5 and thereafter striking upwardly the metal adjoining the slits on the forward or inner sides thereof, the upstruck metal adjoining slit 50*a* being designated 51*a* and that adjoining slit 50*b* being designated 51*b*. The stops on bottom face of the upper shell are similarly formed by slitting the metal diagonally as indicated at 52*a* and 52*b* (Figure 3) and striking upwardly the metal on the forward or inner sides thereof, the upstruck metal adjoining slit 52*a* being designated 53*a* and that adjoining slit 52*b* being designated 53*b*. Raised portions 53*a* and 53*b* appear in somewhat exaggerated fashion in Figures 1 to 4, 7 and 8, while raised portions 51*a* and 51*b* appear normally in Figures 1, 2, 5, 6 and 9.

As will appear, in the preferred embodiment of the invention the position of the pairs of stops is determined in part, at least, by the size, shape and location of raised portion 26 in bottom wall 12 of the upper shell. Raised portions 51*a* and 51*b* on the top wall 10 of the lower shell are preferably struck up to an extent such that the maximum elevation thereof approximately equals the elevation of raised portion 26 on the bottom wall 12 of the upper shell although they may, if desired, be slightly greater or slightly less in elevation. They are preferably located beneath the ends of raised portion 26 and toward the rear limits rather than toward the forward limits thereof, conveniently being disposed below the rear corners of raised portion 26. Raised portions 53*a* and 53*b* in the bottom wall 12 of the upper shell overlie raised portions 51*a* and 51*b* in the top of the lower shell and are so formed as to enable them to receive and straddle raised portions 51*a* and 51*b*, as indicated in dotted lines in Figure 9.

By virtue of the fact that raised portions 53*a* and 53*b* are located at the rear corners of raised portion 26 as shown in Figure 3, little, if any, additional elevation needs be imparted to raised portions 53*a* and 53*b* when raised portion 26 is formed: the offset between the plane of the bottom wall 12 of the upper shell and the plane of raised portion 26 provides at least part of the height required to enable raised portions 53*a* and 53*b* to receive and straddle raised portions 51*a* and 51*b*. If, as in the usual case, raised portions 53*a* and 53*b* are located within the limits of raised portion 26, it follows that raised portions 51*a* and 51*b* on the top wall 10 of the lower shell will likewise be located within such limits. In consequence, an upper shell equipped with raised portion 26 but lacking raised portions 53*a* and 53*b* can be stacked upon a lower shell provided with raised portions 51*a* and 51*b*, thus allowing for indiscriminate stacking of mixed shells if such stacking becomes necessary.

As indicated in somewhat exaggerated fashion in Figure 9, the relationship between raised portions 51*a* and 53*a* is such that when the upper shell is positioned squarely over the lower shell, the edge of raised portion 51*a* on the top wall 12 of the lower shell abuts the metal lying in the

plane of the bottom wall 10 of the upper shell; i. e., the metal adjoining slit 52*a* on the rear or outer side thereof. This provides the "stop" function and this function is a feature of the pair or pairs of cooperating stops whether they be employed with or without the slot-and-tongue assembly at the rear of the two shells and with or without the slot-and-tongue assembly at the front of the two shells. In the preferred form of the invention, slot-and-tongue assemblies are used at both ends, the cooperating stops being at the front end as above described.

With the preferred arrangement of stops 51*a* and 53*a* at one side of raised portion 26 and stops 51*b* and 53*b* at the other, it is virtually impossible to dislodge upper shell from the lower shell accidentally or otherwise except by lifting the forward end of the upper shell sufficiently to enable the metal lying in the plane of the bottom wall 12 of the upper shell to clear lower stops 51*a* and 51*b*, which movement has to be effected against the yielding resistance provided by the interlocking of tongue 27 beneath locking member 22, and laterally traversing the forward end of the upper shell with respect to the forward end of the lower shell until tongue 27 disengages itself from and clears locking member 22 in the direction of lateral movement. Thereafter, the upper shell can be pulled forward or lower shell pushed back until tongue 25 at the rear of the upper shell frees itself from raised portion 21 at the rear of the lower shell, after which the two shells may be moved independently of each other.

In stacking one shell on the other, engagement is first effected at the rear of the two shells, tongue 25 in the bottom of the upper shell being caused to enter into slot 23 in raised portion 21 on the top of the upper shell. Thereafter, with the front end of the upper shell elevated sufficiently above the front end of the lower shell to enable the bottom wall 12 of the upper shell to clear stops 51*a* and 51*b*, the upper shell is angled to one side or the other until tongue 27 in the bottom wall 12 of the upper shell clears locking member 22 in the top wall 10 of the lower shell. Thereupon the direction of angular movement is reversed to cause tongue 27 to enter beneath locking member 22 as previously described. In mid-position; i. e., when the axis of the upper shell exactly overlies the axis of the lower shell, stops 53*a* and 53*b* on the upper shell overlie and encompass stops 51*a* and 51*b* on the lower shell. The forward end of the upper shell is then permitted to drop into position on the forward end of the lower shell, as a result of which the edges of the raised portions 51*a* and 51*b* on the top wall 10 of the lower shell abut the metal going to make up the bottom wall 12 of the upper shell; i. e., the metal from which raised portions 53*a* and 53*b* are formed.

When the parts are so assembled, the disposition of tongue 27 beneath locking member 22 prevents substantial relative vertical movement of the parts. The snap fit between the bottom of the groove 37 and the top of groove 42 prevents accidental lateral displacement of the parts with respect to each other while permitting ready detachment when desired. The engagement of the free or upstruck end portion of the locking member 22 with the sloping shoulder 45 at the end of the groove 42 (Figure 7) prevents relative movement of the upper shell in a forward direction with respect to the lower shell. Inasmuch as the locking parts at the rear of the filing cabinet prevent rearward movement of the upper shell

with respect to the lower shell, it will be seen that both shells are securely locked against longitudinal movement in either direction and against vertical movement at either end of the assembly. Also, the parts are firmly held against accidental lateral displacement, although the sections may be readily dis-assembled when desired.

All this is accomplished without requiring any additional separately formed parts and without requiring any movable parts or additional metal in the shells. All of the interlocking parts are fixed with respect to the shell and hence may be formed rapidly and economically from the metal of planes of conjugation; i. e., the tops and bottoms of the respective shells, by simple stamping operations, the interlocking parts being integral with the shells themselves. While the interlocking parts are preferably arranged as shown with the pivotal interlock at the rear of the units, the arrangement may be reversed if desired and the shells arranged with interlocking parts **21** and **25** near the front and interlocking parts **22** and **27** at the rear thereof. In such case, the pair or pairs of cooperating stops **51***a*, **53***a* and **51***b* and **53***b* will preferably be located at the rear of the assembly.

Those skilled in the art will appreciate that various changes and modifications may be made without departing from the spirit and scope thereof of the invention and that the patent is intended to cover, by suitable expression in the appended claims, whatever features of patentable novelty reside in the invention.

What is claimed is:

1. Means for interlocking a pair of superimposed cabinet units comprising a first unitary slot-and-tongue assembly toward the front of said cabinet units, a second unitary slot-and-tongue assembly toward the rear of said cabinet units, said second slot-and-tongue assembly being in front-to-rear alignment with said first slot-and-tongue assembly in the central vertical plane of the cabinet, and, precluding unintended lateral traverse of either unit with respect to the other, paired cooperating slit-metal stops on opposite sides of said first tongue-and-slot assembly, one component portion of each pair projecting upwardly from the lower unit and another component portion of each pair projecting upwardly from the floor of the upper unit, which stops are angled relative to said central vertical plane so as to become engaged and dis-engaged only upon relative movement in a generally vertical direction.

2. Means for stacking a pair of cabinet units comprising a first generally laterally extending interlock at the forward end of said cabinet units, a second generally laterally extending interlock at the rear end of said cabinet units, said first and second interlocks being aligned with each other in the central vertical plane of the cabinet, and, precluding unintended lateral traverse of either unit with respect to the other, paired cooperating slit-metal stops incorporated in said first interlock at the lateral limits thereof, one component portion of each pair projecting upwardly from the lower unit and another component portion of each pair projecting upwardly from the floor of the upper unit, which stops are angled relative to said central vertical plane so as to become engaged and dis-engaged only upon relative movement in a generally vertical direction.

3. A pair of filing units or the like adapted to be locked together in superposed relationship, the top wall of the lower unit and the bottom wall of the upper unit having interengaging parts near the rear thereof adapted to prevent the rear of the upper unit from being lifted from the lower unit and to prevent the upper unit from being moved rearwardly with respect to the lower unit, the top wall of the lower unit having a raised rearwardly facing locking member adjacent the front thereof and the bottom wall of the upper unit having a forwardly facing tongue engageable with said locking member by lateral movement of the front portion of one unit with respect to the other, the engagement of said parts being adapted resiliently to limit lifting of the front of the upper unit from the lower unit and to prevent the upper unit from being moved forwardly with respect to the lower unit, the bottom wall of the upper unit being recessed on either side of said tongue to receive said locking member to permit the upper unit to be disposed on the lower unit with their adjacent walls substantially in contact with said locking member received in the recessed portion of the bottom wall and then to be moved laterally with respect to the lower unit to bring said tongue into engagement with said locking member, and a pair of stop members on opposite sides of said locking member adapted to prevent lateral movement of said units with respect to each other, said stop members being disengageable upon lifting of the front of the upper unit from the lower unit.

4. A pair of filing units or the like adapted to be locked together in superposed relation each having a top wall and a bottom wall, the top wall of the lower unit and the bottom wall of the upper unit having overlapping longitudinally abutting interengaging parts near the rear thereof adapted to prevent the rear of the upper unit from being lifted from the lower unit and to prevent the upper unit from being moved rearwardly with respect to the lower unit, one of said walls having a raised rearwardly facing locking member adjacent the front thereof and the other of said walls having a forwardly facing tongue integral therewith, said locking member overlapping and longitudinally abutting said tongue whereby to prevent the front of the upper unit from being moved forwardly with respect to the lower unit, said forwardly facing tongue being laterally engageable with and disengageable from said locking member by lateral movement of the front portion of one unit with respect to the other, and interengaging stop means adjacent the front of said units for preventing lateral movement of the front portion of one unit with respect to the other, said stop means comprising upstruck portions on the top wall of the lower unit engageable within recesses provided by upstruck portions in the bottom wall of the top unit.

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