A. H. LEVENE.

LOCKING MECHANISM FOR SHELVING AND OTHER ARTICLES.

APPLICATION FILED OCT. 2, 1919.

1,423,861. Patented July 25, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

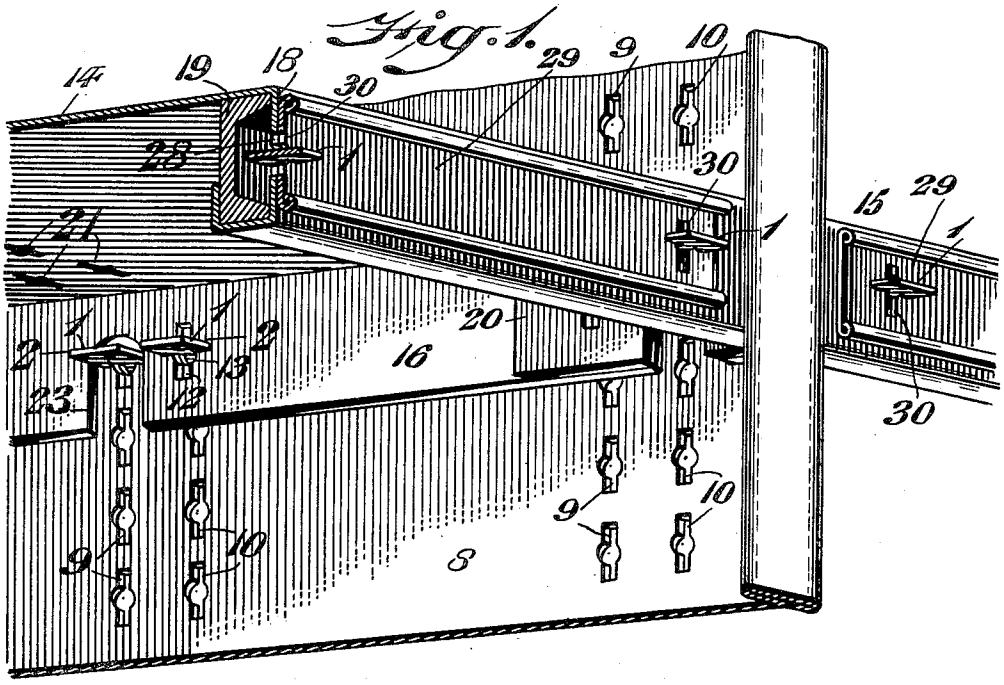


Fig. 5.

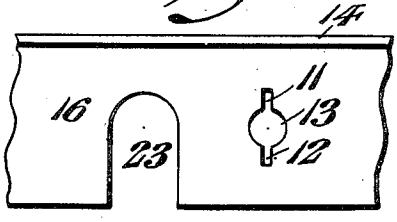


Fig. 2.

ON LINE. 2-2. FIG. 1.

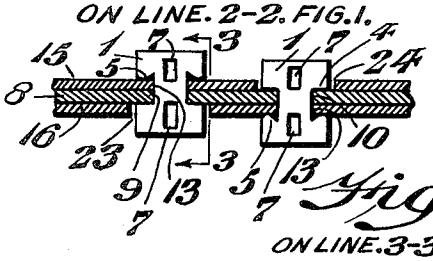


Fig. 6.

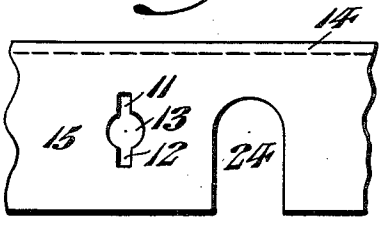


Fig. 3.

ON LINE. 3-3. FIG. 2.

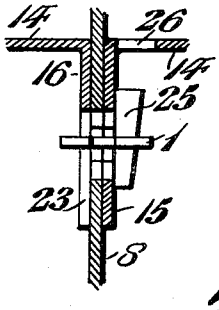
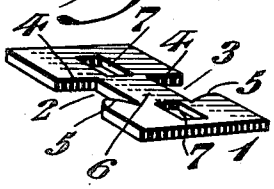


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 7.

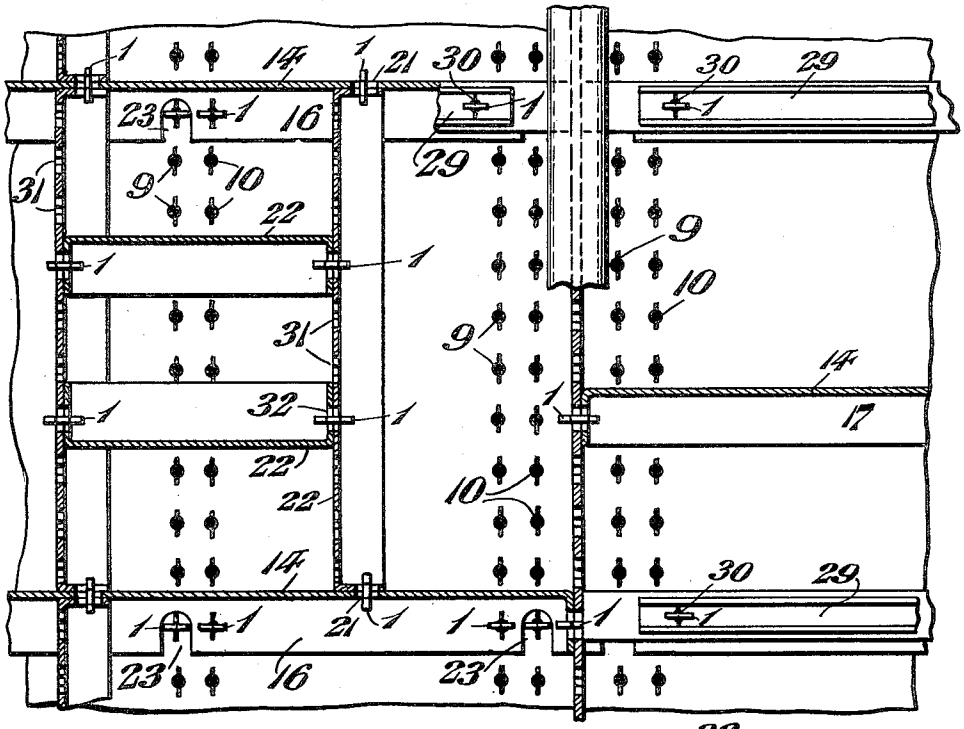


Fig. 10.

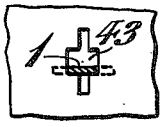


Fig. 11.

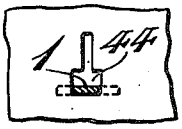


Fig. 12.

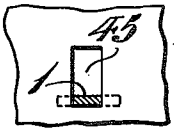


Fig. 8.

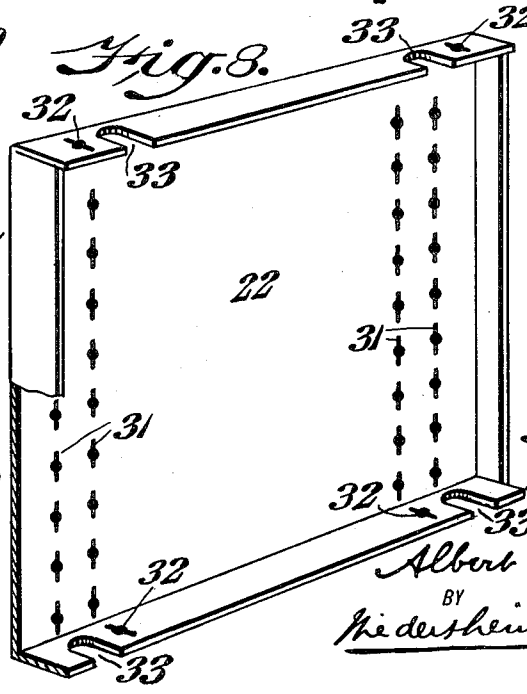
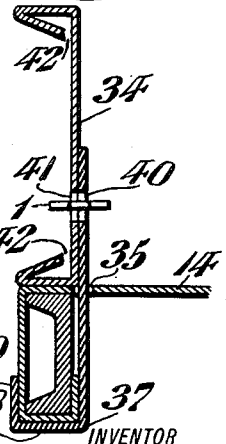


Fig. 9.



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LOCKING MECHANISM FOR SHELVING AND OTHER ARTICLES.

1,423,861. Specification of Letters Patent. Patented July 25, 1922.

Application filed October 2, 1919. Serial No. 327,904.

To all whom it may concern:

Be it known that I, ALBERT H. LEVENE, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Locking Mechanism for Shelving and other Articles, of which the following is a specification.

My present invention comprehends a novel construction of locking mechanism for securing together a plurality of plates or other parts and although not limited to such use it is especially designed to be employed for securing shelves in their adjusted position so that they may be readily changed without the use of tools in order that the shelves may be adjusted to suit the character of material which is to be stored.

It further comprehends a novel construction of an upright, a novel construction of shelves and a novel construction of locking members whereby aligned shelves may be secured in position on opposite sides of an upright and one of the shelves removed without affecting the locked condition of the other shelves.

It further comprehends a novel construction of a divider or partition and novel means for securing it to either an upright or a shelf.

It further comprehends a novel construction and arrangement of a bin front.

Other novel features of construction and advantage will hereinafter more clearly appear in the detailed description of the invention.

For the purpose of illustrating my invention, I have shown in the accompanying drawings typical embodiments which are at present preferred by me, since said embodiments will give in practice satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents, in perspective, a locking mechanism for shelves and other articles embodying my invention.

Figure 2 represents a section on line 2—2 of Figure 1.

Figure 3 represents a section on line 3—3 of Figure 2.

Figure 4 represents, in perspective, a locking member employed.

Figure 5 represents, in side elevation, a shelf flange to be used on one side of an upright.

Figure 6 represents, in side elevation, a shelf flange to be used on the opposite side of an upright.

Figure 7 represents, in front elevation and partly in section, shelving embodying my invention.

Figure 8 represents, in perspective and partly broken away, a shelf or shelf spacing device employed.

Figure 9 represents a sectional view of a bin front embodying my invention.

Figures 10, 11 and 12 represent other embodiments of my invention showing more particularly a different type of slot which can be employed. Similar numerals of reference indicate corresponding parts.

Referring to the drawings.

1 designates a fastening device embodying my invention and as best seen in Figure 4 it comprises a strip of material having the opposite sides slotted, as indicated at 2 and 3. The side wall of each slot at one side of it is provided with a straight wall as seen at 4 while its opposite side wall is curved or rounded as at 5, so that a wedging action will take place when the locking device is assembled with respect to the parts to be locked as will be hereinafter more fully explained. Between the slots 2 and 3 there is a neck 6 and on one or both sides of this neck, I provide an aperture 7 into which a tool may be inserted if desired to remove it from locking position or to move it into locking position.

The body portion of the locking member 1 may have any desired contour but is preferably rectangular as shown.

I will now explain the manner in which my locking device is adapted to be employed in conjunction with shelving so that the different portions thereof may be rigidly secured in adjusted position.

8 designates the uprights which are provided with two rows of apertures 9 and 10, respectively, and each aperture consists of a rectangular shaped upper and lower slot 11 and 12, respectively, which opens into a preferably centrally located aperture 13 which may be of any desired contour so that it serves as a bolt hole in case it is de-

sired to fixedly secure shelves or other devices with respect thereto.

14 designates the shelves which are provided with the downwardly extending side flanges 15 and 16, a rear flange 17 and a front flange 18 which is bent around a reinforcing bar 19, as will be understood by reference to Figure 1. It will be understood that this reinforcing member 19 may be of any desired form and as illustrated at its free ends it is laterally bent as at 20, see Figure 1, in order that one of the locking devices may pass therethrough if desired. The body of the shelf if desired may be provided with a desired number of apertures or slots 21, see Figure 1, and also Figure 7, in order that spaces or partitions 22 can be adjustably secured between different shelves if desired, and in Figure 7, I have shown different constructions which may be employed for providing compartments between the shelves.

The side flange 16 of a shelf is provided with a slot 23 opening through its bottom and located on one side of one of the slots of a double row of slots. The flange 15 of the shelf is provided with an aperture 24 opening through its bottom and located on the opposite side of one of the line of slots in the upright.

When the shelves are to be assembled they may be placed in alignment with or out of alignment with the shelves on the opposite side of the same upright.

It will be apparent that if a shelf is to be secured with respect to an upright all that it is necessary to do is to bring its slots into register with desired slots in the upright and insert a locking device such as 1 through the slot and give it a half turn whereupon the flanges of the shelf and the upright will be wedged together and securely held in position as is evident.

If two shelves on opposite sides of an upright are to be secured in horizontal alignment then the locking members 1 will pass through each shelf and the upright to secure the two parts together and it will also pass through the open aperture or slot such as 23 and 24 on the opposite side of the upright, so that one shelf can be removed and adjusted without affecting the fixed and locked condition of the other shelf. The manner in which this action can take place will be readily understood by reference to Figures 1 and 2. If desired, a wedge 25 may be driven through an aperture 7 and a locking device 1 or wedges may be driven through both of the apertures 7 in case two are employed and if it is desired to use a long wedge, as shown in Figure 3, the shelf would preferably be apertured as indicated at 26.

The front wall 18 of the shelf is provided with slots 28 corresponding to those which make up the line of slots 9 and 10 and a title holder 29 is provided with slots 30 of the same construction so that when the locking devices 1 are secured in place the parts appear as seen in Figure 1. The title holder or name plate 29 as shown consists of a plate having its top and bottom edges deflected towards the body portion of the plate so that a name plate or card will be retained thereby.

In case it is desired to make the compartments smaller than could be done by the use of standard shelves, I employ the dividers or partitions 22 which are seen in Figures 7 and 8, it being understood that they may be of different dimensions in accordance with the character of compartment which is to be formed. The body portion or table of each spacer 22 is provided with a desired number of rows of slots 31 which are the same construction as those heretofore recited. The flanges are provided in a similar manner with slots 32 and apertures 33 opening through the bottom of the flange. The apertures at opposite ends of the flange are located on opposite sides of the juxtaposed slots, see Figure 8, so that when a locking member, as 1, has been secured in position, one spacer can be removed without affecting the locked condition of the aligned spacer.

It will be apparent from Figure 7 that these dividers such as 22 may be secured either in a vertical or a horizontal position and when secured in horizontal position they can be secured with their flanges directed upwardly or downwardly.

If a customer should desire to have a bolted construction instead of an adjustable one, the shelves and uprights are standard for such type of each construction since if the locking members 1 are dispensed with the parts can be bolted together owing to the provision of the bolt hole intermediate the ends of the slots.

If desired, bin fronts such as 34 can be secured to the shelves by providing a shelf with an aperture 35 through which passes the upwardly extending portion of a bracket 37 which is laterally deflected as at 38 and then upwardly as at 39, see Figure 9, in order to closely fit the front of the shelf. The upwardly extending portion 36 is provided with a slot 40 of the construction herein described and the bin front is provided with a similar slot 41 so that the parts may be locked together by means of a key or locking member 1. The top of the bin front 34 is deflected laterally and then inwardly as is also the bottom of the bin front so as to form the spaces 42 into which a tag or name plate may be inserted as will be evident to those skilled in this art.

It will be apparent that if a straight narrow slot was employed in the shelves, par-

titions or uprights a locking member of the type disclosed could not be employed unless the width of the slot was greater than the width of the neck of the locking member, since it could not be turned in such a slot in locked condition. It is therefore necessary to have intermediate the ends of each slot an enlargement or have the slot of the aperture of greater width in order to provide for the turning of the neck portion 6 of the locking member. This enlargement therefore has a double function which serves to provide for the turning of the locking member into locked position and it is also adapted to receive a fastening device in case it is desired to make a bolted and more rigid construction instead of an adjustable one.

It will of course be apparent that if desired the width of the slots may be such that the locking devices can be turned in them without rendering it necessary to increase the width of the slots intermediate their ends. I therefore do not desire to be limited in every case to the employment of a slot in which its width or diameter is increased intermediate its ends as at 13.

It will of course be understood that the contour of the apertures, as 13, is immaterial as long as it permits the turning of the neck portion 6 where such neck portion is made wider than the width of a slot as 11 or 12 and it is within the scope of my invention to form the aperture 13 of any desired contour.

In Figures 10, 11 and 12, I have shown different types of slots which may be employed in accordance with my invention. In Figure 10, the slot 43 is provided intermediate its ends with a rectangular shaped aperture while in Figure 11 the slot is provided with a rectangular shaped aperture 44 located at one end of the slot. In Figure 12, the slot 45 is of such width that the neck 6 of the locking device can be turned to bring the locking device into its locking position. In so far as I am aware, I am the first in the art to devise an adjustable shelving of the character described in which a plurality of parts can be locked together in alignment and wherein one of the parts can be removed without affecting the locked condition of the other parts by the turning and removing of a locking member and it is to be understood that my claims to such features are to be interpreted with corresponding scope.

Special attention is directed to the novel construction of a divider such as 22 employed. It will be seen that this divider is provided with outwardly extending flanges in order to impart to the divider the necessary rigidity and these flanges also serve to receive the locking devices, whereby the divider may be employed either as a divider or as a subsidiary shelf and can serve as a subsidiary shelf when the flanges are turned downwardly and when the flanges are turned upwardly as will be understood by reference to Figure 7, the divider serves as a combined shelf and bin, the front flange of the divider forming the bin front. The slots or apertures formed in the two members which are to be locked together are of such height as to receive the locking members and these slots have a portion of such width as to enable the turning of the locking members into locked position. This portion of a slot of increased width may be located at any desired place in the lineal length of the slot and in order to illustrate some of the ways in which this slot can be formed, I have shown different forms of slots wherein the portion of increased width to enable the turning of the locking member is intermediate the ends of the slots and also at an end of the shelf, it being understood that it can be located at either end of the slot or any point therebetween.

The contour of the locking portion of the locking member such as, for example the neck, is preferably such that it will conform to the contour of the wall of the slot which forms a seat for the locking member.

It will now be apparent that I have devised a novel and useful locking mechanism for shelving and other articles which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have, in the present instance, shown and described, preferred embodiments thereof which will give in practice satisfactory and reliable results, it is to be understood that such embodiments are susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A shelving member having a double line of apertures, shelving members on opposite sides of said first shelving member, the side members each having an aperture to register with one line of apertures in the first shelving member, and locking devices to pass through registering apertures, the shelving member on one side being removable without affecting the locked condition of the member on the other side.

2. The combination of a shelf, a bin front, and a clip to secure said bin front to said shelf, said shelf being apertured to receive said clip, the lower end of said clip forming a seat for the shelf, said bin front and clip having registering apertures, and a locking device in said apertures.

3. In a shelving, a combination of an outer, an inner and an intermediate member and a pair of locking members, the inter-

mediate member having slots and the outer and inner members having apertures to register with the slots of the intermediate member, said locking members passing in opposite directions through the registering apertures and slots to lock two of the members together without interfering with the other member.

4. The combination in shelving, of a shelf having spaced rows of apertures, a divider having flanges with spaced apertures arranged in pairs, one of which opens through such flange, a second divider on the opposite side of the shelf having a flange with spaced apertures arranged in pairs one of which opens through such flange, and locking devices to pass through each pair of apertures in the flange and the shelf apertures registering therewith.

5. The combination in shelving, of an upright having spaced rows of apertures, a shelf having flanges with spaced apertures arranged in pairs one of which opens through the bottom of the flange, a second shelf on the opposite side of the upright having a flange with spaced apertures arranged in pairs one of which opens through the bottom of such flanges, and locking devices to pass through said apertures in a flange and the upright apertures registering therewith.

6. The combination with an upper and a lower shelf, each having front and rear flanges and a line of apertures in proximity to each flange, of dividers each having side flanges and a front flange, the side flanges of a divider having apertures to register with the apertures in the shelves, said dividers having also a line of apertures in their body portions in proximity to their front and rear edges whereby when one of the dividers is positioned horizontally the apertures in its side flanges will register with the apertures in the body portion of the other two dividers, and locking devices co-operating with said apertures to secure the parts in locked condition.

7. The combination with an upper and a lower shelf, each having front and rear flanges and a double line of apertures in proximity to each flange, of dividers each having side flanges and a front flange, the side flanges of a divider having a double line of flanges to register with the apertures in the shelves, said dividers having also a double line of apertures in their body portions in proximity to their front and rear edges, whereby when one of the dividers is positioned horizontally the apertures in its side flanges will register with the apertures in the body portion of the other two dividers, and locking devices co-operating with said apertures to secure the parts in locked condition.

8. The combination with an upper and a lower shelf, each having front and rear flanges and a double line of apertures in proximity to each flange, of dividers each having side flanges and a front and rear flange, the side flanges of a divider having a double line of flanges to register with the apertures in the shelves, said dividers having also a double line of apertures in their body portions in proximity to their front and rear edges, whereby when one of the dividers is positioned horizontally the apertures in its side flanges will register with the apertures in the body portion of the other two dividers, and locking devices co-operating with said apertures to secure the parts in locked condition.

ALBERT H. LEVENE.

Witnesses:
H. S. FAIRBANKS,
F. A. NEWTON.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,423,861, granted July 25, 1922, upon the application of Albert H. Levene, of Philadelphia, Pennsylvania, for an improvement in "Locking Mechanism for Shelving and other Articles," errors appear in the printed specification requiring correction as follows: Pages 3 and 4, strike out present claims 3, 4, 6, and 7 and insert the following as claims 3, 4, 6, and 7:

3. In shelving, the combination of an outer, an inner and an intermediate member and a pair of locking members, the intermediate member having apertures and the outer and inner members having apertures and recesses to register with the apertures of the intermediate member, said locking members passing in opposite directions through the registering apertures and into registering recesses to lock two of the members together without interfering with the other member.

4. The combination in shelving, of a shelf having spaced rows of apertures and recesses arranged in pairs, a divider having spaced rows of apertures and recesses arranged in pairs, a second divider on the opposite side of the shelf having spaced rows of apertures and recesses arranged in pairs, and locking devices to pass through apertures registering with recesses and extending into registering recesses.

6. The combination with an upper and a lower shelf each having a line of apertures in proximity to its opposite edges, of dividers each having apertures to register with the apertures in the shelves, said dividers having also a line of apertures in their body portions in proximity to their front and rear edges, whereby when one of the dividers is positioned horizontally the apertures at its opposite edges will register with the apertures in the body portion of the other two dividers, and locking devices co-operating with said apertures to secure the parts in locked condition.

7. The combination with an upper and a lower shelf, each having a double line of apertures in proximity to their opposite edges, of dividers each having a double line of apertures to register with the apertures in the shelves, said dividers having also a double line of apertures in their body portions in proximity to their front and rear edges, whereby when one of the dividers is positioned horizontally its apertures will register with the apertures in the body portion of the other two dividers, and locking devices co-operating with said apertures to secure the parts in locked condition.;

page 4, line 71, claim 8, for the word "flanges" read *apertures;* and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 12th day of September, A. D., 1922.

[SEAL.] KARL FENNING,
Acting Commissioner of Patents.