March 25, 1930. N. S. AMSTUTZ 1,751,677

FOLDING BOOKRACK

Filed March 26, 1925 3 Sheets-Sheet 1

Fig. 1

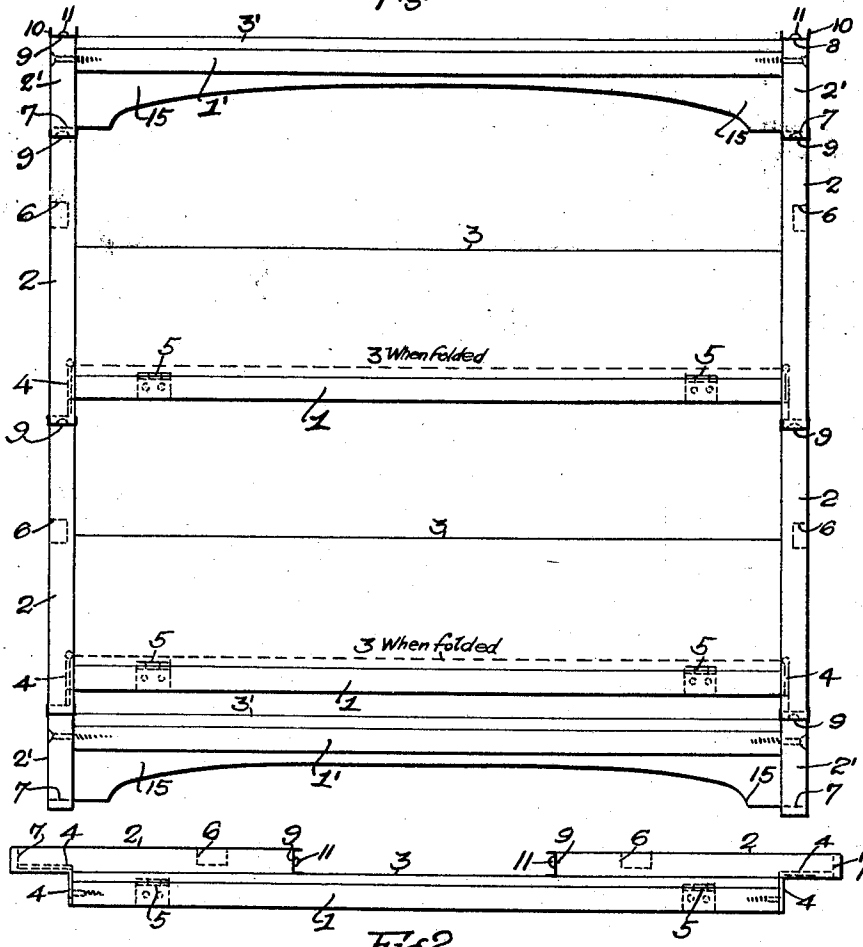


Fig. 2.

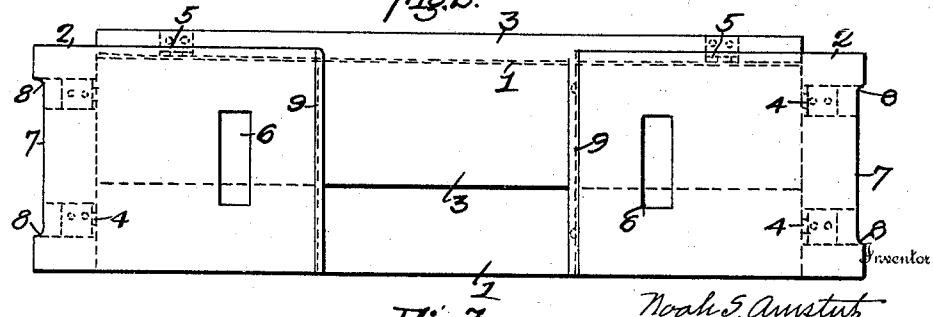


Fig. 3.

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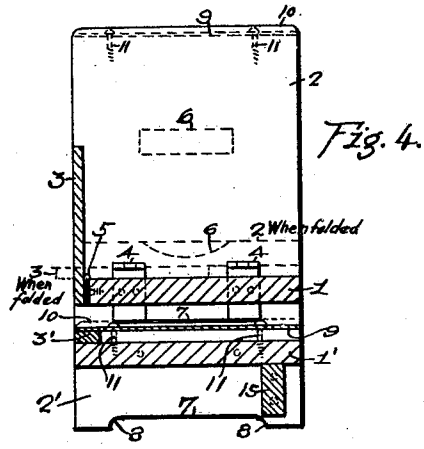


Fig. 4.

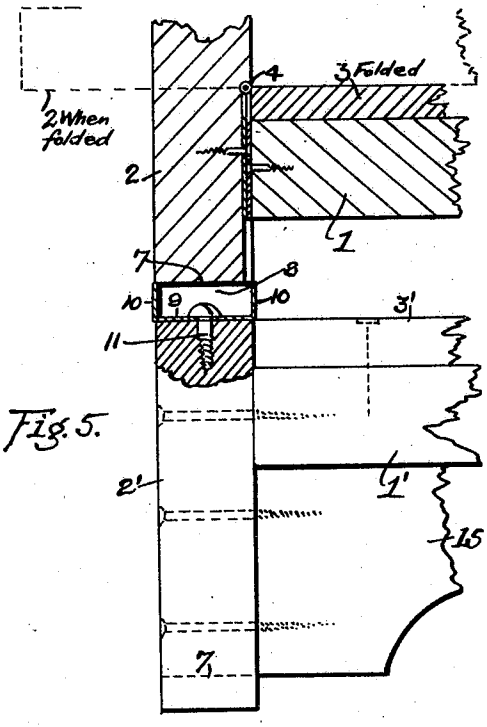


Fig. 5.

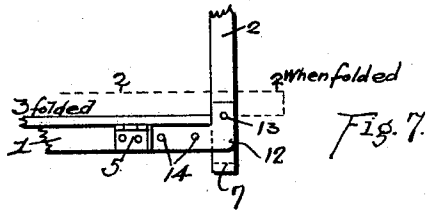


Fig. 7.

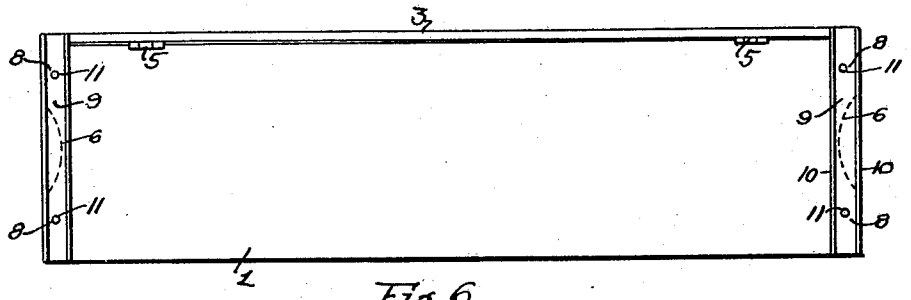


Fig. 6.

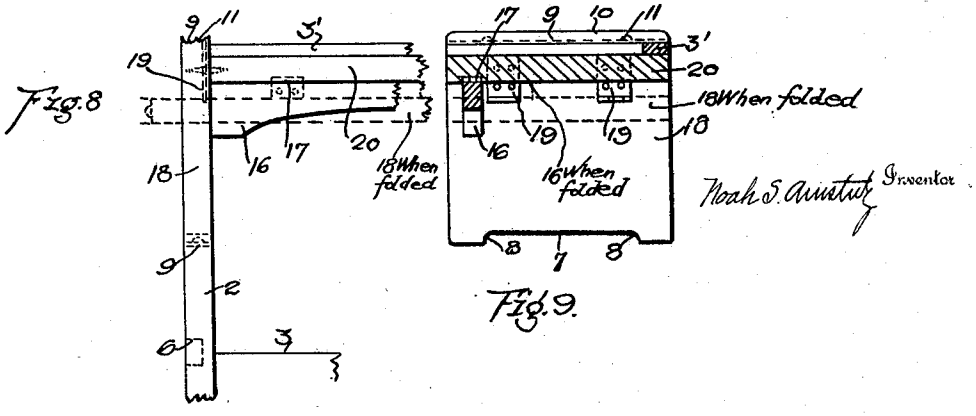


Fig. 8.

Fig. 9.

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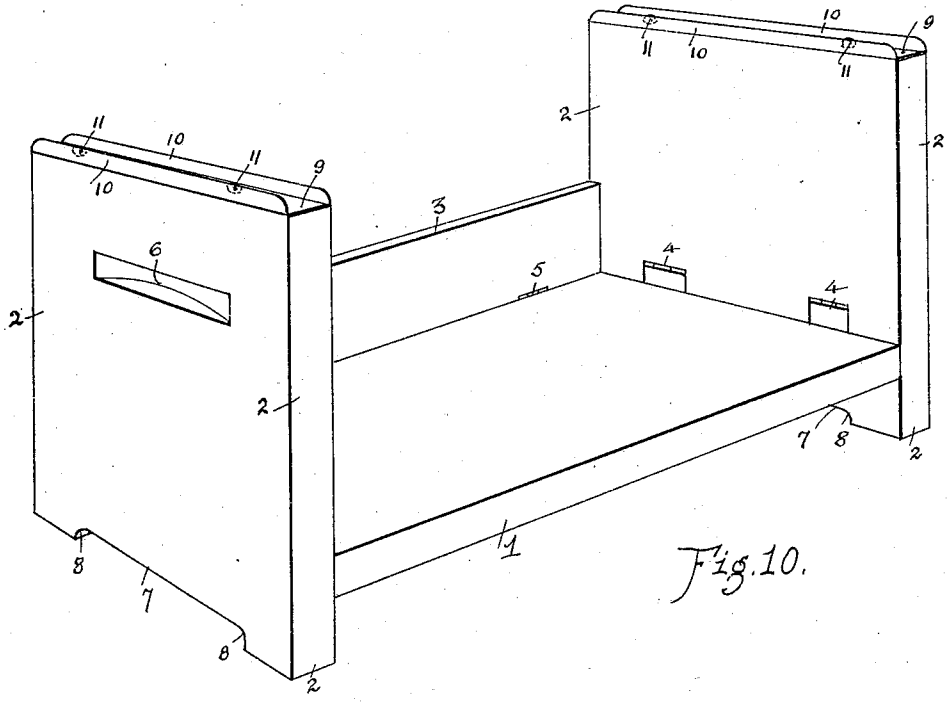


Fig. 10.

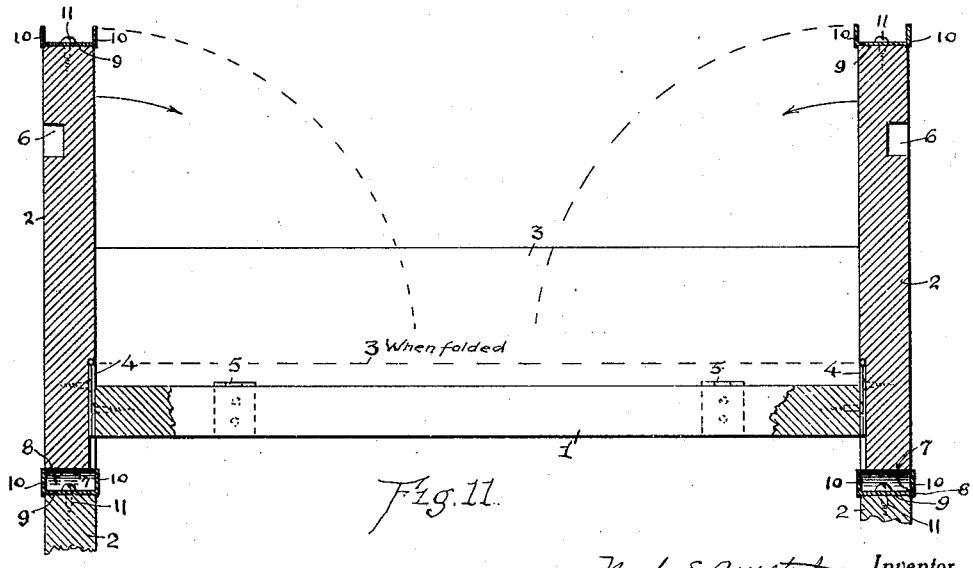


Fig. 11.

Noah S. Amstutz Inventor

Patented Mar. 25, 1930 1,751,677

UNITED STATES PATENT OFFICE

NOAH S. AMSTUTZ, OF VALPARAISO, INDIANA

FOLDING BOOKRACK

Application filed March 26, 1925. Serial No. 18,527.

My invention relates to improvements in folding book racks and it more especially consists of the features pointed out in the annexed claims.

The purpose of my invention is to provide a self contained folding book rack which is simple in construction; that folds flatwise into small compass; that has all the parts secured to each other; that has no removable parts to be combined with the other parts when the book rack is unfolded; that has a hinged back which folds under the hinged ends; that may have a cooperating base and top if desired; and that has self registering means to position the book racks when they are assembled one above another.

With these and other ends in view, I illustrate in the accompanying drawing such instances of adaptation as will disclose the broad underlying features without limiting myself to the specific details shown thereon and described herein.

Figure 1 is a front elevation of two book rack units assembled one above another with base and top sections.

Fig. 2 is a front elevation of a book rack in its folded relation.

Fig. 3 is a plan view of Fig. 2.

Fig. 4 is an elevation in cross section showing two units assembled one above another.

Fig. 5 is a cross section of the self aligning features between two units.

Fig. 6 is a top plan view of a book rack in its unfolded state.

Fig. 7 is a modified form of hinge.

Fig. 8 is a detachable end portion of either an extreme top or extreme bottom foldable unit duplicates of each other.

Fig. 9 is a cross section of Fig. 8 approximately on the line of the hinge 17, shown in Fig. 8.

Fig. 10 is a front view perspective of one of the center foldable units.

Fig. 11 is a vertical section of Fig. 10.

In the practical use of folding book racks it is essential that there be no detachable parts to the end that when the book rack is folded it will be complete in every essential portion of its construction. This obviates the necessity of combining detachable or separate portions to erect a book rack ready for use. In addition, it is also essential to make provision for preventing books from sliding off toward the rear when a filled rack is carried from place to place.

It is of the highest utilitarian value to have individual unit book racks of light weight and of moderate size to enable the business man, engineer, architect, editor, author, and research worker to easily segregate in a portable fashion such groups of books with which he is immediately concerned. The portable feature enables anyone to carry a single unit from place to place so as to easily get away from annoyances of one kind or another, find more private quarters for undisturbed study, etc. This facility brings about a degree of flexibility in its use which under present conditions one is not able to attain.

Another practical utility of my invention resides in the use that students can make of the folding book racks described herein. Their use will inculcate system and orderliness in a student's quarters which are ordinarily more or less congested. Whenever the occasion arises to move from one place to another the books can be compactly grouped in boxes for shipment and the book racks folded into small space flatwise so as to be easily packed in the bottom of the trunk. These book racks can be used singly or stacked one above the other as desired. It is not necessary to use a base of top unless such are wanted.

In practically carrying out my invention, I may use any suitable flat board 1 as a book support. To this at each end the folding end members 2 are secured by means of hinges 4. These hinges are let into the inside face of the end members 2 and they are also secured to the ends of the book support 1. The centers of the pins of hinges 4 are placed above the upper face of the support 1 sufficiently far to allow the hinged backs 3 to fold onto the support 1 beneath the hinged ends 2 as shown in Fig. 2.

The backs 3 are pivoted to the supports 1 by means of hinges 5 secured to the rear edges of the supports and to the lower front faces of the backs, as shown in Fig. 4. The hinges 5

form a stop for the backs 3 to hold them in an erect position when the book rack is unfolded because their pivot centers are positioned above the lower face of the supports 1, which position also permits the backs to lie flat against the upper face of the supports when the book racks are folded.

The individual units are easily carried from place to place, or reassembled in groups by means of the hand-holds 6. When the ends 2 are raised the backs 3 prevent the ends collapsing. Ordinarily no catches are necessary to hold the backs in a raised position because there is enough friction between a back and its cooperating two ends to hold the back raised. When a book rack is carried, the books on the support tend to slide rearward because the unit is naturally held so as to tilt backward. This holds the books against the back 3 which is of course positively held in place.

Recesses 7 are formed on the under edges of the sides 2 so as to leave two feet with facing edges 8. The feet rest in channels 9, having sides 10, which are secured to the upper edges of the ends 2 by means of round headed screws 11. These screws, the edges 8 and the sides 10 of the channels 9 form self aligning features which hold assembled units from displacement, endwise of the units and also in a front to back relation. This expedient does not however prevent the immediate disengagement of the units from each other.

Whenever it is desired to use a base and a top with a group of units these may be formed similar to the regulation racks, of the same length and depth but of reduced height, with identical hinging and folding features. A base only may be used underneath a given group when books etc., are to be placed on the uppermost unit which are taller than the height of each section, thus permitting them to project above the ends 2. Of course a special top could obviously be made, in which the ends would project below the main board or support 1 and hinged to it to fold underneath, in order to make "head room" for extra length books, pamphlets, etc.

It is also possible to make the separate bases and tops rigid, shown in Fig. 1, when used for ornamental trimming. In this event, the rigid ends 2′ are fastened to the supports 1′, a rear rail 3′ secured to the upper face of the supports and a front apron 15 is attached to the under face of the supports. Channels 9 with screws 11 and abutting edges 8 are formed as on the regular units. If an extra base and top are assembled one above another in the middle of a group of units very shallow shelves are secured which, if desired, will add variety to the arrangement of any given group of units.

The hinges 4 may be replaced by the L shaped surface hinges 12, shown in Fig. 7, in which the upstanding member forms the pivot at 13. Screws 14 attach the hinges to the support 1. Whatever kind of hinges are used, the end and rear edges of the support 1 serve to limit the extent to which the back 3 and the ends 2 can be unfolded, thus serving to hold the raised ends and raised back firmly against accidental collapse.

If the back be hinged high enough to fold over the ends this is considered an equivalent of the structure in which the ends fold over the back.

The structure shown in Figs. 8 and 9 is to furnish extra "head room" on the top or between any intermediate units for extra long books or pamphlets etc. It comprises a flat board 20 to the extremities of which ends 18 are hinged similar to the ends 2, except that in the case of ends 2 these fold over the top of the back 3 and in contrast the ends 18 fold under the apron 16 which is attached to the board 20 by means of hinges 17. Hinges 19 secure the ends 18 to the board 20.

It is of course immaterial as to how the units are assembled in relation to each other. Ordinarily, for students' use it may be found that a single foldable unit, without a top or base will be ample to serve his needs while at college. A single unit will enable anyone to "travel light" and yet afford a ready means to attain orderliness economically and without complexity.

What I claim is:

1. In folding book racks, a flat support, ends projecting above and below the same, a back extending upward from the under face of the support, hinges for securing the back to the support so as to allow the back to fold onto the upper face of the support, and means for hinging the ends to the support at about right angles to the back so that when the back is folded down the ends will fold toward each other flatwise onto the back.

2. In folding book racks, a rectangular support, a back hinged above the top face and foldable onto the support, a pair of ends hinged to the support above the top surface of the back so as to be foldable flatwise onto the back, and cooperating self aligning means positioned on the upper and lower edges of the ends to hold a plurality of ends in assembled relation to each other when the parts are unfolded.

3. In folding book racks, a unitary structure comprising a support, a back hinged to the support above its under face and projecting above and below the hinges and ends hinged above their lower edges to the support, all so assembled that the back folds first onto the support and the ends thereafter onto the back so that all the parts when folded lie approximately on parallel planes and when unfolded at angles to each other.

4. In folding book racks, a support, hinged ends folding toward each other above the support, channels, projecting means for hold-

ing the channels on the upper edges of the ends, and cooperating recesses formed on the under edges adapted to register with the projecting means when the lower edges of a pair of ends are positioned in the channels of another pair of ends.

5. In folding book racks, a relatively flat support, hinged ends extending above and below the support, a continuous channel on the upper edge of each end, means between the channels and the lower edge of the ends whereby the cooperation between these parts constitutes self aligning means adapted to hold separate pairs of ends in a predetermined front and back and sidewise assembled relation instantly separable from each other.

6. In folding book racks, a base serving also as a top when assembled with unitary book rack sections, comprising a support, ends attached thereto, a back secured thereon, feet formed on the lower edges of the ends, and guiding channels on the upper edges of the ends.

In testimony whereof I affix my signature.

NOAH S. AMSTUTZ.