July 7, 1953 C. S. BROWN 2,644,588

LIBRARY SHELF ARRANGEMENT

Filed Nov. 9, 1950 5 Sheets-Sheet 1

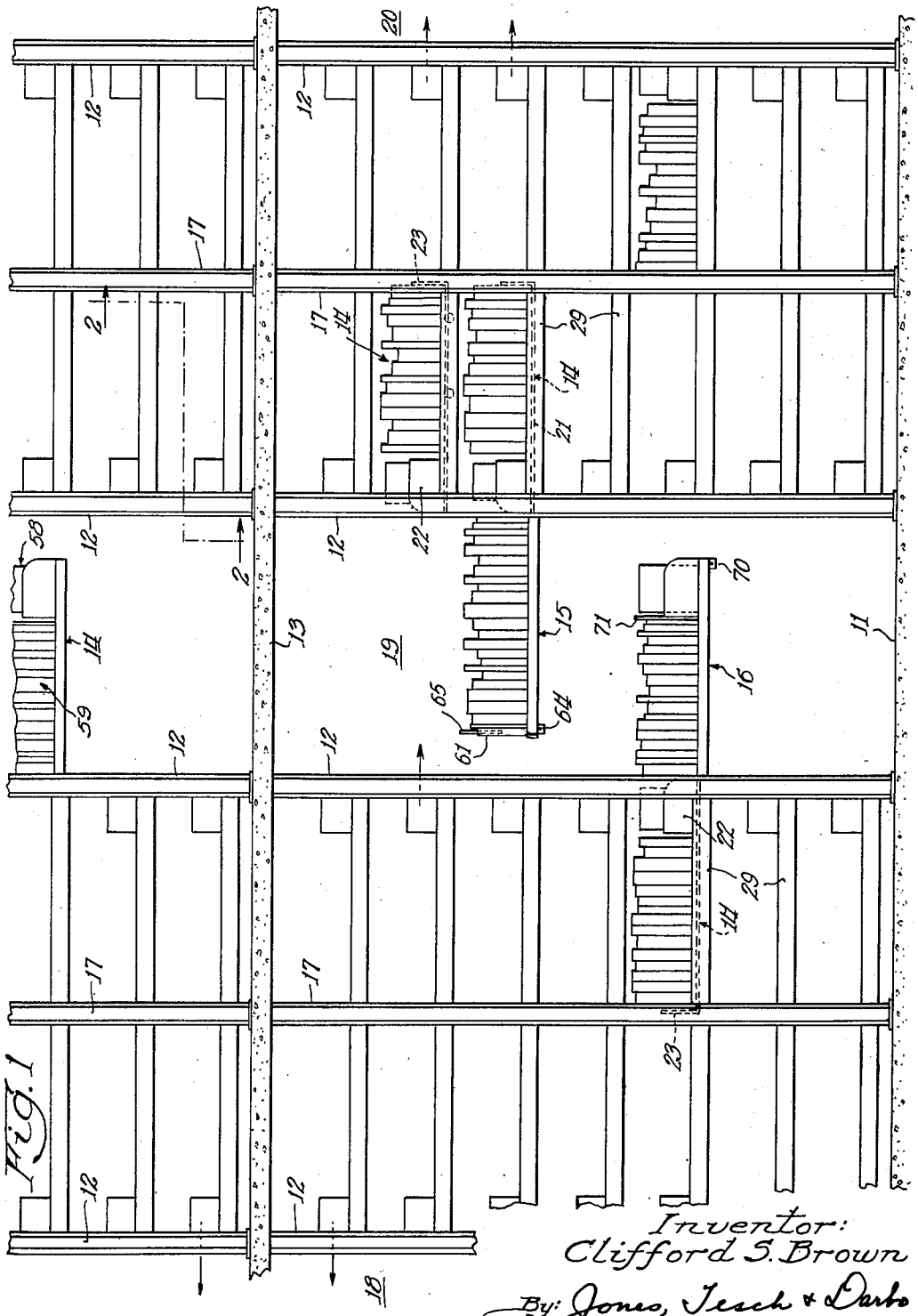


Fig. 1

Inventor:
Clifford S. Brown
By: Jones, Tesch & Darbo
Attys.

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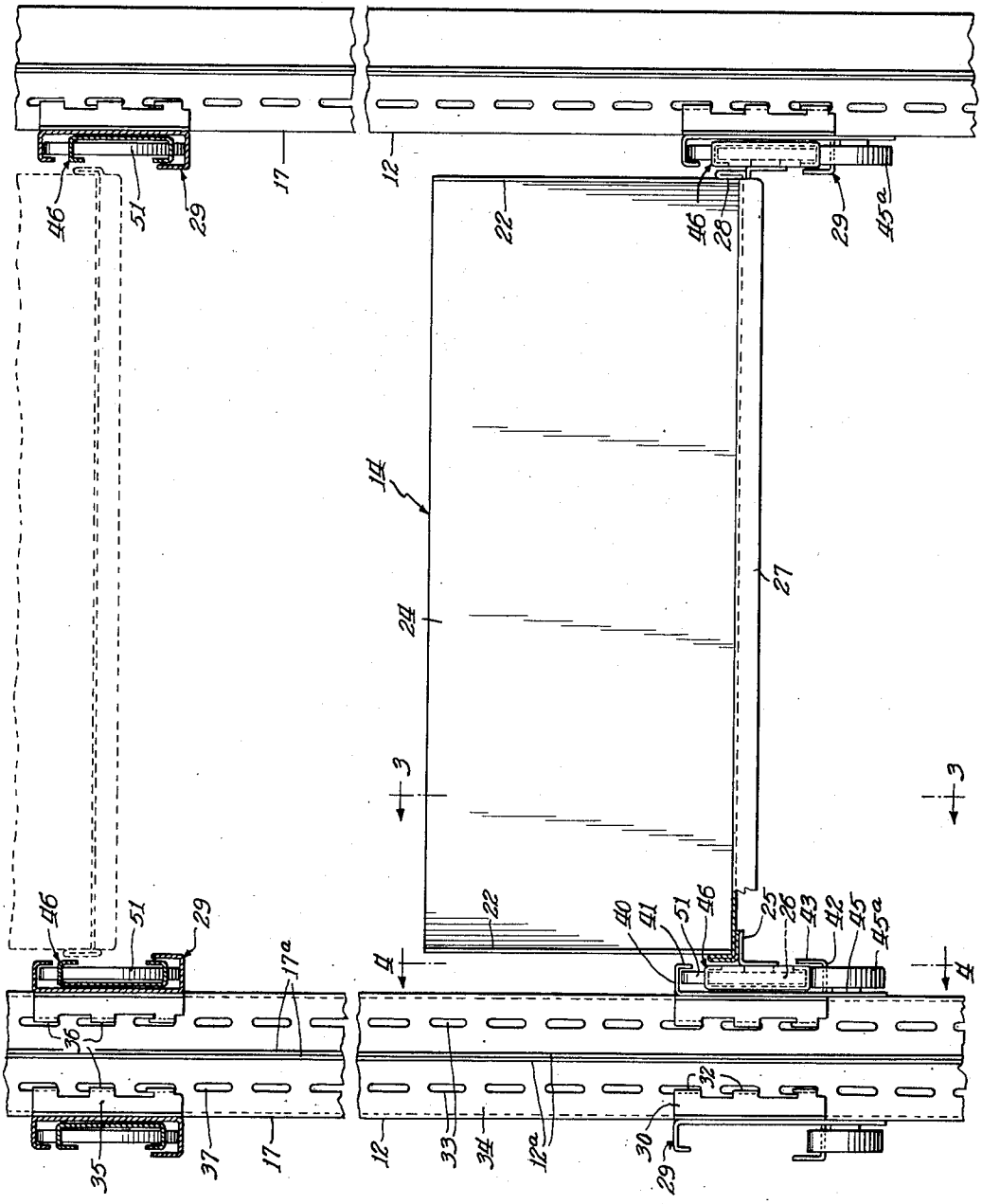


Fig. 2

Inventor:
Clifford S. Brown
By: Jones, Teach & Darbo
Attys.

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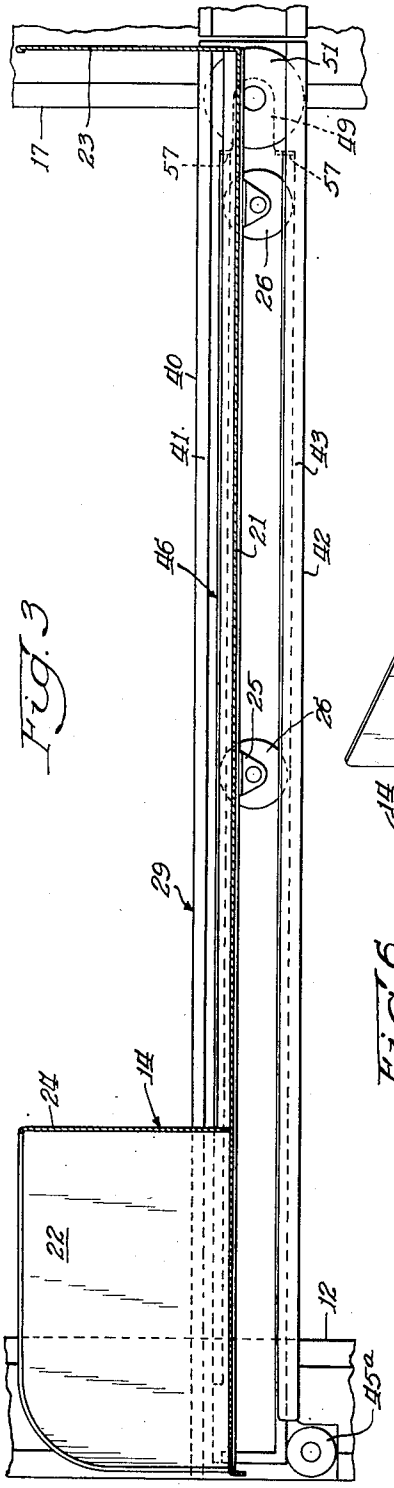


Fig. 3

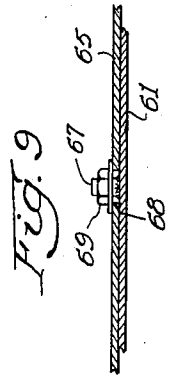


Fig. 9

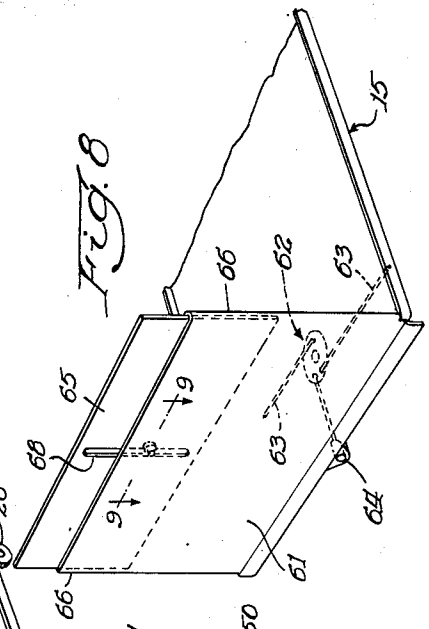


Fig. 8

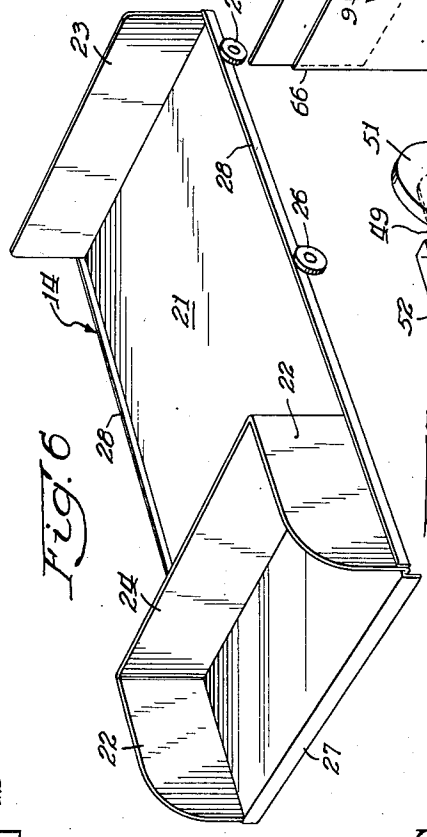


Fig. 6

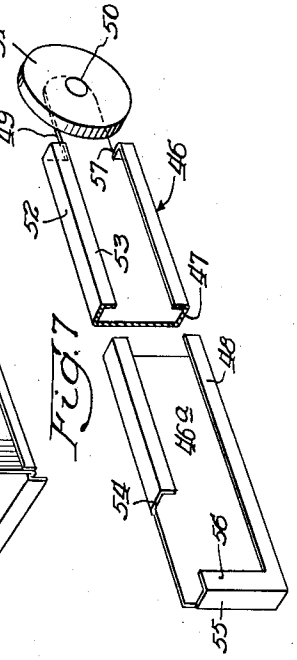


Fig. 7

Inventor:
Clifford S. Brown
By: Jones, Tesch & Darbo
Attys

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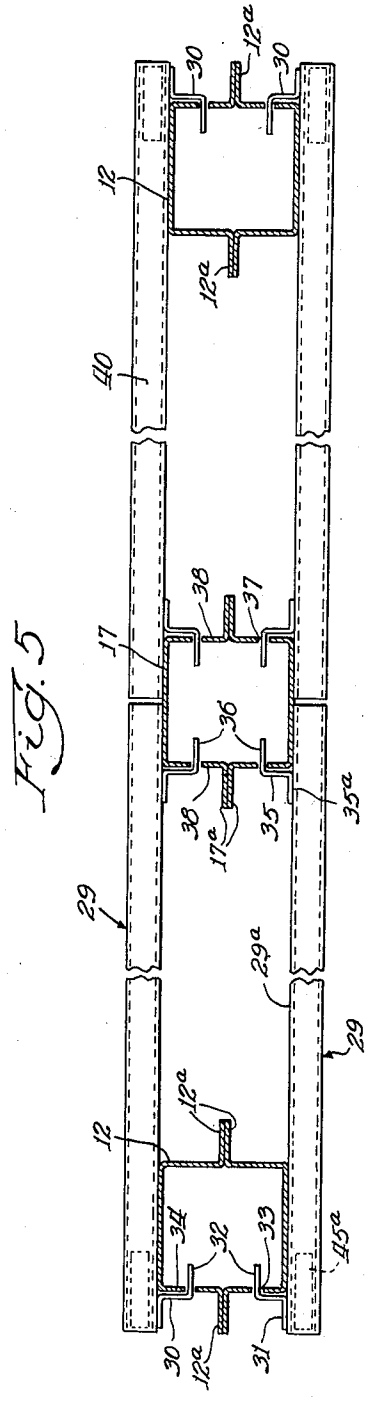


Fig. 5

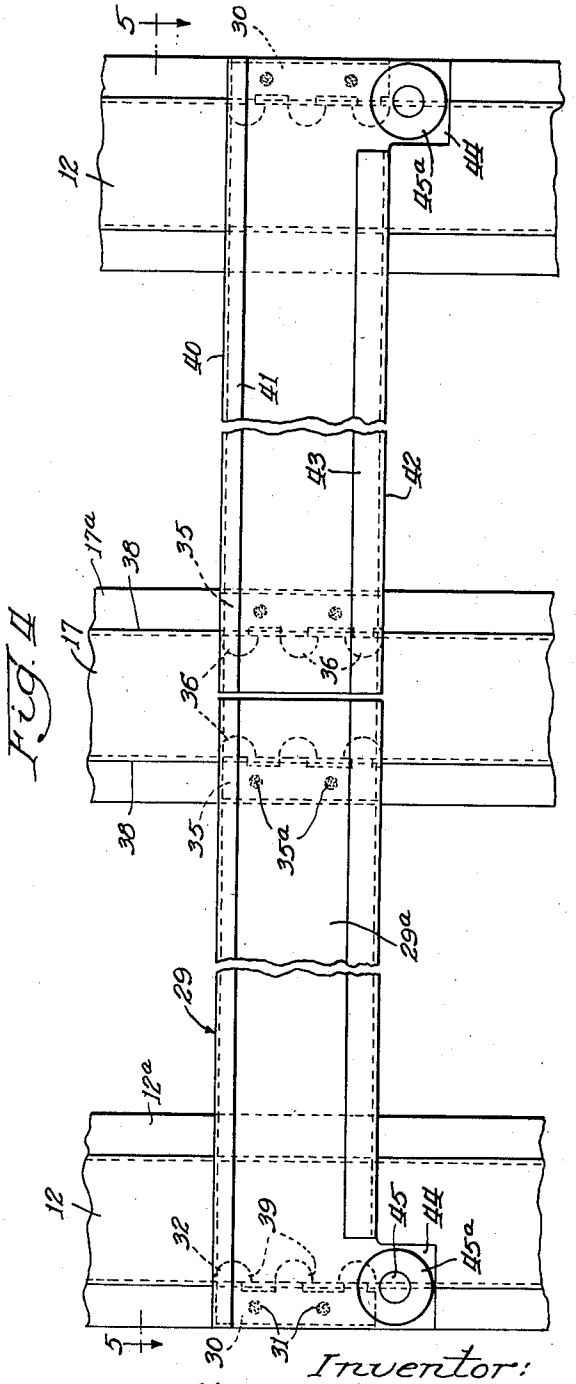


Fig. 4

Inventor:
Clifford S. Brown
By: Jones, Tesch & Darbo
Attys.

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Fig. 13

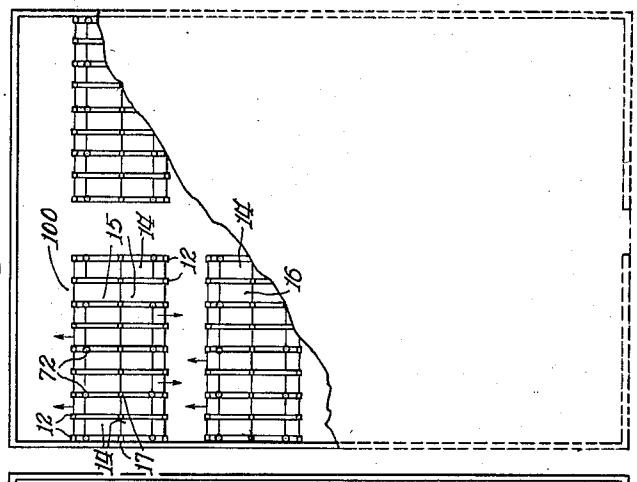


Fig. 12

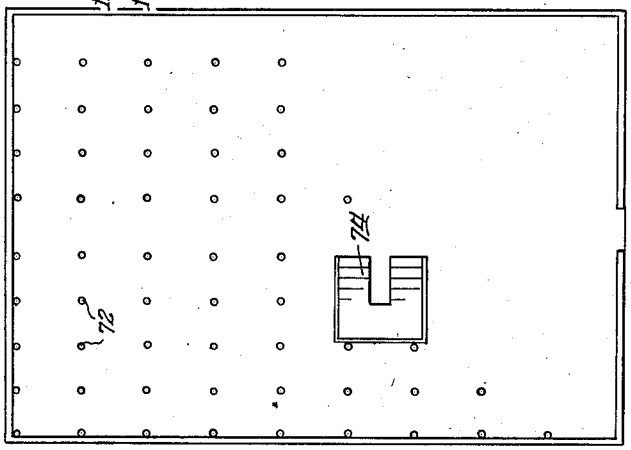


Fig. 11

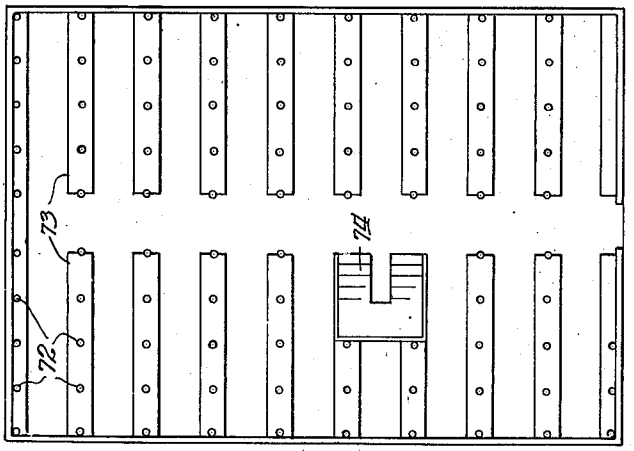
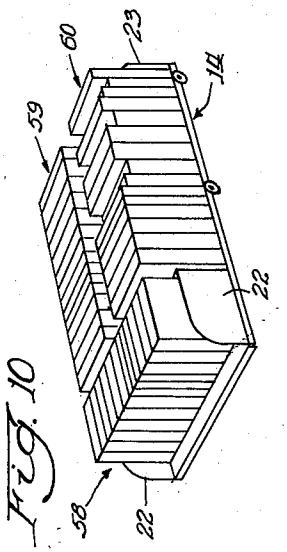


Fig. 10



Inventor:
Clifford S. Brown
By: Jones, Tesch & Darbo
Attys.

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UNITED STATES PATENT OFFICE

2,644,588

LIBRARY SHELF ARRANGEMENT

Clifford S. Brown, Wauwatosa, Wis., assignor to Hamilton Manufacturing Company, Two Rivers, Wis., a corporation of Wisconsin

Application November 9, 1950, Serial No. 194,839

3 Claims. (Cl. 211—42)

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This invention relates to library shelf arrangements and is especially applicable to library book stacks for large and busy libraries, and particularly for archives and records.

Among other objects, the present invention aims to provide an arrangement which will materially enhance the capacity of a given library space, while at the same time rendering the books or the like more readily accessible, together with simplified provision for guarding some of the books against unauthorized access in certain instances.

In an important aspect, the invention desires to provide a novel arrangement of upright supports carrying longitudinally slidable shelves, each shelf being arranged to carry a row of books or the like transversely across its front and two longitudinal rows of books to the rear of the front row. This invention makes a further contribution to a compact stack system in that each shelf and track therefor may be sold assembled as a unit and readily installed at a desired level on the stack uprights.

These and other objects and advantages will be apparent from the following description, taken together with the accompanying drawings, of illustrative embodiments of the library shelf arrangements of the present invention, and in which drawings—

Figure 1 shows an elevational view, taken from a side aisle, certain of said shelves indicating modifications for preventing unauthorized access, this figure showing also a second floor of a library in cross-section and indicating how the supports for the first floor shelves may support the floor and the supports for the second shelving;

Figure 2 is an enlarged front sectional view taken on the staggered line 2—2 of Fig. 1, with parts further broken away for clearness of description;

Figure 3 is a view on the scale of Fig. 2 showing in side elevation a multiple track for a shelf and being partly in section through the shelf as on the line 3—3 of Fig. 2;

Figure 4 is a view somewhat similar to Fig. 3 but omitting the drawer and the auxiliary track and showing the fixed track on its supports, there being here shown a pair of such tracks, broken away to save space, arranged end to end for a pair of shelves;

Figure 5 is a plan view, partly in section through the supports, taken on the line 5—5 of Fig. 4;

Figure 6 is a perspective view of one of the shelves;

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Figure 7 is a perspective view of an auxiliary or slidable track, broken away to save space;

Figure 8 is a fragmentary perspective view of the front end of a lockable drawer carrying also a front closure;

Figure 9 is an enlarged cross-section of the front closure of Fig. 8;

Figure 10 is a perspective view of one of the shelves showing the preferred book arrangement with the books facing in three directions.

Figure 11 is a floor plan of a conventional library floor and book stack arrangement, which may be replaced by the arrangement of the present invention;

Figure 12 is a view of the floor plan of Fig. 11 with the conventional book stacks of Fig. 11 removed; and

Figure 13 is a floor plan of the library space of Fig. 11 adapted to the shelf arrangement of the present invention.

A conventional library book stack arrangement, with shelves arranged with their longer sides facing the aisles, as in Fig. 11, is uneconomical of space and is lacking the means for guarding some of the books against unauthorized access except by locking the entire floor or sections thereof. By means of the present invention, and as shown in Fig. 13, the same amount of floor space as in Fig. 11 may have its capacity substantially doubled by eliminating half of the aisle space, while at the same time permitting individual shelves or parts of shelves to be releasably locked against access, as presently more particularly referred to.

Turning to Fig. 1, the numeral 11 may indicate the floor of a first floor library shelf arrangement embodying the present invention, including upright supports 12 which may be suitably anchored (by well known means which need not be here described) to the floor 11 and also to the ceiling 13 of the first floor shelf arrangement which may in turn constitute the floor of a second floor library shelf arrangement comprising another tier of supports 12.

The supports 12 occur adjacent the front ends of elongated slidable shelves 14, or 15, or 16 which are arranged vertically and in parallel on the supports 12 and are also carried by intermediate upright supports 17, intermediate supports 17 serving to carry the rear ends of a pair of end to end aligned shelves. It will be understood that the shelves are also arranged in parallel longitudinally and are longitudinally slidable on the supports, by means presently more particularly described, so that the shelves of a pair carried by the intermediate upright supports 17 may be

pulled out in opposite directions into the cross aisles 18 and 19 respectively, in one case, and into the transverse aisles 20 and 19 in an adjoining location. At the same time the longer sides of some of the shelves are accessible from a longitudinal aisle transverse to all of the cross aisles 18, 19 and 20.

Some of the shelves may be of the form shown by the numeral 14, others of the form shown by the numeral 15 and still others of the form shown by the numeral 16. The shelf 15 however, as presently explained would not be on a longitudinal aisle. In the case of the shelf 14, the shelf desirably, and as best seen in Fig. 6 includes a shelf plate 21 and book abutments thereon for the novel arrangement of books as shown. These include book abutments 22 at each side of the shelf adjacent the front end thereof disposed longitudinally thereof and a book abutment 23 at the rear end of the shelf and disposed transversely thereof. Parallel to the abutment 23 there may also be included a book abutment 24 disposed transversely of the shelf adjacent and at the rear of the first mentioned abutments 22 and spaced from the abutment 23 at the rear end of the shelf.

The various shelves, as here shown, may be formed of sheet metal and the shelf plate may have depending lugs 25 in which may be axled rollers 26 for anti-friction purposes in the sliding movements of the shelves, there being preferably four such rollers for each shelf. At the front of the shelf may be formed a downturned lip 27 for strengthening purposes, and also which may serve as a handle for pulling out the shelf. Upturned side edges 28 may prevent book slippage and also stiffen the shelf. This construction provides a shelf plate occupying desirably a minimum of distance vertically.

As best seen in Figs. 4 and 5, upright supports 12 carry one of the tracks for each shelf, at the forward end of the shelf, and an upright support 17 carries the tracks for two aligned shelves end to end. The supports 12 are conveniently formed of channel iron material having outwardly flaring flanges 12*a* which are lapped and suitably welded together to form a hollow element box-like in cross-section constituting the support. Similarly the supports 17 have lapped and welded flanges 17*a*.

The fixed tracks shown in Figs. 4 and 5 are fixed in the sense that they do not move during ordinary operation of the shelves, but, for purposes of assembly and readjustment when desired, the fixed track 29 has a bracket 30 welded as at 31 to the vertical wall 29*a* of the track. The bracket 30 includes a plurality, in this instance three vertically spaced hooks or gibs 32 which are received in vertically spaced and aligned slots 33 in the transverse wall 34 of the upright support 12. At the rear of the track 29, a similar bracket 35, welded as at 35*a*, carries a plurality of laterally projecting hooks or gibs 36 which engage in vertically spaced and aligned slots 37 in the side walls 38 of the upright supports 17. It will be understood that slots 33 may be provided throughout the major part of the height of the supports 12 in two vertical rows in each of the transverse walls thereof both back and front, so as to be interchangeable, and similarly slots 37 may be provided in two vertical rows in each of the similar walls of supports 17. The slots 33 and 37 are of a size just sufficient to receive the gibs 32 and 36 respectively and the track is then dropped down so that the noses 39 of the gibs take over the lower edges of the slots to interlock the track and support.

Each fixed track 29 includes an overhanging upper wall 40 (Fig. 2) which extends laterally toward the shelf and terminates in a downturned flange 41. Along its lower edge each fixed track 29 includes an underslung lower wall 42 which terminates in an upturned flange 43. While the upper wall 40 extends throughout the length of track 29, the lower wall 42 stops short of the forward end thereof. Here the side wall 29*a* is continued downwardly as at 44 to have axled therein at 45 a wheel 45*a*. It is to be understood that the fixed tracks 29 are arranged in pairs each to receive a shelf thereon and are reciprocally formed to constitute such pairs respectively.

The sliding track 46 has a side wall 46*a* which laps the side wall 29*a* of the fixed track but is of less vertical height so that the sliding track 46 telescopes within the fixed track to slide forwardly and rearwardly therein. Along its lower edge the sliding track 46 has a lower wall 47 which terminates in an upturned flange 48. The lower wall 47 of the sliding track is of less width than the lower wall 42 of the fixed track so that the flange 48 of the sliding track is retained by the flange 43 of the fixed track. At its forward end the sliding track lower wall 47 rides on the wheel 45*a* of the fixed track. At its rear end, the side wall 46*a* of the sliding track is extended rearwardly as at 49 and has axled therein as at 50 a wheel 51, which is of a diameter larger than the vertical height of the sliding track 46 and of a size to ride on the lower wall 42 of the fixed track 49 while at the same time engaging the upper wall 40 of the fixed track.

Along its upper edge the sliding track 46 has a laterally extending upper wall 52 which terminates in a downwardly extending flange 53. This upper wall and flange terminates short of the forward end of the sliding track 46 leaving an opening 54 to receive the rollers 26 of the shelf 14. Also, at its vertical forward end, the sliding track 46 has a front wall 55 and a flange 56 in the plane of the flange 43. Parts 55, 56 form a stop for the forward roller 26 of the shelf 14. Similarly, at its rear end, the sliding track 46 has stops 57 for the rearward rollers 26. It will be understood that the tracks 46 are also formed reciprocally and arranged in pairs respectively for each shelf and each pair of fixed tracks.

When a shelf is assembled with its sliding track the shelf is canted upwardly at its forward end to permit its rear pair of rollers 26 to be inserted in the opening 54 in a pair of sliding tracks. The shelf is then moved rearwardly on the sliding track until the intermediate pair of rollers 26 can be inserted through the opening 54 into the sliding track. Thereupon the shelf 14 may be slid rearwardly and forwardly on the sliding track within the limits of the stops 55 and 57 of the sliding track.

Next, the wheels 51 of the sliding track are located within the flanges of the fixed track 29, and the sliding track, with the shelf thereon, moved rearwardly on the fixed tracks, the lower wall of the sliding track being supoprted on and moving relatively to the wheels 45*a* at the forward edges of the fixed tracks.

When the shelf is pulled forwardly it will move to the forward end of the sliding track, without movement of the latter, until the forward rollers

26 meet the stops 55 at the forward end of the sliding tracks, whereupon the shelf and sliding tracks will move forward together with respect to the fixed tracks. At this time, since the rollers 26 are located at the rear half end of the shelf, the sliding tracks will underlie approximately one-half of the length of the shelf, to support the latter while the shelf itself hangs sufficiently withdrawn (i. e., for example full length as seen in Fig. 1) from between the upright supports to permit access to the books or the like arranged not only transversely along the front of the shelf as at 58 but also arranged in two rows longitudinally thereof as at 59 and 60 (Fig. 10).

It will be understood that the row of books 58 arranged transversely on the shelf along the front thereof are retained by the longitudinally extending abutments 22 of the shelf and if desired by the transverse abutment 24 at the rear end of the longitudinally extending abutments 22. Thus the abutments 22—24—22 form a partial enclosure for the books therein, which may be arranged with their backs facing forwardly as is customary, so that the titles on the backs of the books of the front transverse row may be read by the users of the library. The two parallel rows of books 59 and 60 are arranged in rows longitudinally of the shelf with their title carrying backs facing laterally outwardly, and are retained by the abutment 23 at the rear end of the shelf. At the forward end they are retained either by the abutment 24, or, where that is omitted, by the front row of books 58 and the rear edges of abutments 22. The books arranged transversely of the shelf between the abutments 22 may be books which are more frequently referred to so that they may be removed from the shelf without sliding the shelves forwardly, while the books arranged longitudinally in rows 59 and 60 may be books which are less frequently referred to, but to which access may be readily had by sliding the parts forwardly on their tracks as already described.

Where it is desired to guard all of the books on a given shelf against unauthorized access, a shelf such as indicated at 15 may be employed. Here, as best seen in Fig. 8, the abutments 22 and 24 of the shelf 14 are eliminated, and the shelf 15 is boxed by a front permanent closure 61. The shelf 15 may carry locking means of any suitable character indicated somewhat diagrammatically at 62, by which lock bars 63 may be actuated to engage suitable locking recesses in the adjacent upright supports 12. The lock bars 63 may be actuated, through the mechanism 62, by means of a key (not shown) engageable with a key cylinder 64, of, say, the rotatable cam type, at the lower front edge of the drawer 15.

In order to accommodate various adjusted distances between shelves, by vertical adjustments of the fixed tracks on the uprights as already described, the front closure 61 of the drawer 15 may have a vertically adjustable extension 65 which may slide in grooves 66 formed by bending inwardly the vertical side margins of the closure 61. The closure 61, as best seen in Fig. 9 may have welded thereto on its rear face a stud 67 which may play in a vertical slot 68 in the extension 65. A lock nut 69 screwed on the stud 67 may be loosened or tighted to fix the vertical adjustment of the extension 65. This adjustment means is thus inaccessible except when the drawer 15 is unlocked and slid forwardly.

The books on the shelf 15 may all be arranged in two parallel longitudinally extending rows

with their title-carrying backs facing oppositely and laterally outward, and when the drawer 15 is locked in position, all of the books thereon are rendered inaccessible, since such a shelf would normally be located between other parallel contiguous shelves, for example, as shown at 100 (Fig. 13) and thus the books could not be reached without sliding the shelf 15 forwardly.

A shelf such as indicated at 16 might be employed that would have locking means 70 (Fig. 1) similar to the locking means 64 of shelf 15 but which would otherwise be like shelf 14, except that the abutment 71 of the shelf 16 would take the place of the abutment 24 of the shelf 14 and would be extended to a greater height. Thus with the shelf 16, the books arranged transversely along the front edge of the shelf would not be concealed or locked from access, but the shelf itself could be locked so that it could not be slid forwardly to give access to the books arranged longitudinally at the rear of the shelf 16.

Where all the books are intended to be freely accessible it will be understood that some of the shelves will face two intersecting aisles and thus the books arranged thereon both transversely and longitudinally will be accessible without sliding the shelves forwardly.

Referring again to Fig. 11, this shows a conventional library arrangement comprising uprights 72 and shelves 73 arranged with their longer sides facing forwardly. The arrangement shown in Fig. 11 could be converted to the arrangement of the present invention by removing the shelves 73 while leaving the uprights 72 in position, as shown in Fig. 12. The uprights 72 may support an upper floor level to which access might be had by the stairs 74. Additional upright supports 12 and 17, of the present disclosure, could then be arranged interspersed with the original uprights 72, as shown in Fig. 13, having shelves of the present invention supported thereby. This arrangement eliminates approximately half of the aisle space which is necessary in a conventional library stack arrangement of Fig. 11 and provides a compact stack system of the present invention thus substantially doubling the capacity of the same given library floor space.

If desired, the abutment 71 of the shelf 16 may be extensibly constructed, as shown, for example, with respect to the extensible closure 61 for the shelf 15.

Each of the shelves may be sold assembled as a unit with a pair of fixed tracks 29 and a pair of auxiliary tracks 46, thus facilitating handling and installation.

So constructed and arranged a maximum amount of the vertical space in the stack may be utilized for books and records, waste space may be minimized, and flexibility promoted.

It is to be understood that the term books and the like includes many different kinds of records or reading material, whether loose, bound or in special containers.

The invention is not intended to be limited to details of construction shown for purposes of exemplification. Furthermore, it is not essential in every case that all features of the invention be used conjointly since various combinations and sub-combinations may at times be advantageously employed. Such changes may be made as fall within the scope of the appended claims without departing from the invention.

See also my co-pending application Serial No. 324,531, filed December 6, 1952.

The invention having been here described, what is here claimed is:

1. In a library shelf arrangement including a plurality of upright supports and shelf supporting means carried by and between the supports, the combination, with extension tracks slidable on the shelf supporting means, of an elongated shelf slidable longitudinally on said extension tracks, said shelf being longer from front to rear than it is wide and open at the front thereof, the width of the shelf being substantially equal to the depth of two normal rows of books, a relatively short book abutment disposed longitudinally of the shelf at each side thereof adjacent the front end of the shelf, a forward transverse book abutment disposed adjacent and at the rear of the first mentioned abutments and spaced from the rear end of the shelf whereby the front end of the shelf provides a compartment for holding books in a transverse row across the front of the shelf between said longitudinal abutments with their title-carrying backs facing forwardly and accessible without withdrawing the shelf from between said supports, and a transverse book abutment at the rear end of the shelf spaced from said forward transverse abutment whereby the portion of the shelf between said transverse abutments provides a rear compartment for holding books in two rows longitudinally of the shelf with the backs of the books of the longitudinal rows facing oppositely and laterally outwardly of the shelf, the shelf between said transverse abutments being substantially unobstructed at its sides to facilitate lateral withdrawal of books from said rear compartment, and means for causing the extension tracks to move partially forwardly with the shelf and with respect to the supports as the shelf is withdrawn from between the supports, whereby the books of said longitudinal rows are accessible and their titles readable from opposite lateral sides of the shelf respectively when the shelf is withdrawn from between said supports, the shelf at such time being intermediately supported by said extension tracks.

2. The structure of claim 1 wherein means are included for releasably locking the shelf to prevent movement thereof from between the supports, whereby unauthorized access to the books in said longitudinal rows is prevented while access to the books in said front compartment is unobstructed.

3. The structure of claim 2 wherein the forward abutment is formed in overlapping sections one of which is vertically movable with respect to the other and wherein means are provided for locking the sections in vertically extended relation, the last mentioned locking means being inaccessible when the shelf is locked by the first mentioned locking means.

CLIFFORD S. BROWN.

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