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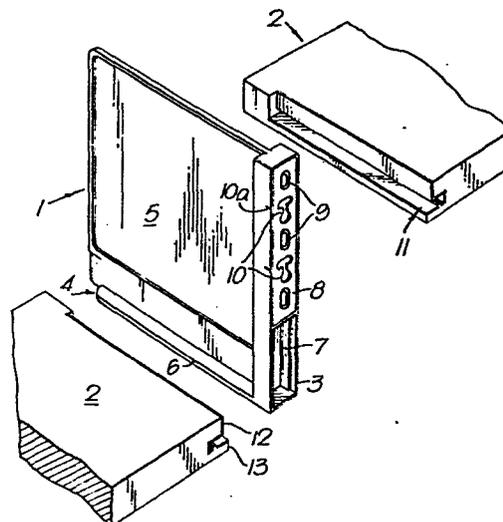
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54 A shelving system.

57 In a shelving system of the type comprising wall-mounted or pillar-mounted supports (1) for shelves (2), supporting tongues (6) on the supports are so concealed within grooves (11) at the ends of the shelves that a substantially continuous front surface is created for adjoining shelves. An insert (14) can be placed in each said groove (11) to facilitate the provision of the engagement of the shelves and supports.

Fig. 1.



"A shelving system"

THIS INVENTION relates to a shelving system and, more particularly, to a shelving system which may be suspended from a vertical wall, or from other vertical supports.

5 Many different shelving systems have been developed in the past for many different purposes. Some prior systems are free standing and some are adapted to be suspended from a vertical wall. In many of these prior proposed systems, support brackets are provided which are located under the shelves and support the shelves. Such brackets are often bulky and are not
10 of a pleasing appearance. Where two shelves abut one another, often two support brackets have to be provided, there being one bracket for each shelf. This is costly and unsightly.

One particular prior shelving system is described in patent publica-
15 tion GB-A-1137675 and comprises a plurality of shelf support members provided with respective horizontally extending tongues adapted to be received within respective grooves located at the ends of a plurality of shelves. However, this prior system does not provide a substantially entirely concealed means of support for the shelves, and a substantially continuous
20 front edge to adjoining shelves is not created.

The object of the present invention is to provide an improved shelving system.

25 According to the present invention there is provided a shelving system comprising: at least one intermediate support member and at least two end support members, each said support member being adapted to be supported on a wall or the like, the or each intermediate support member having two tongues extending substantially horizontally away from one

another, and each end support member having at least one substantially horizontal tongue; and at least two shelves each having two opposed substantially vertical end faces, each such end face having a respective substantially horizontal groove therein adapted to receive, and thus conceal, a respective one of the said tongues, the tongues thus supporting the shelves; the arrangement being such that, when the tongues of the or each intermediate support member are received within respective said grooves of an adjacent pair of shelves, the respective edges of the two shelves remote from the said wall or the like substantially abut one another to define together a substantially continuous front surface.

Preferably, each tongue is provided with a channel extending parallel to the length of the tongue, the channel being adapted to engage a rib either on the shelf itself or on insert adapted to be inserted into the said groove of the shelf, the rib in either case protruding into the groove.

Alternatively, the tongue and groove are adapted to provide a dove-tail fit. In order to provide such a dove-tail fit, conveniently the said groove has a trapezoidal cross-section and the tongue either has a corresponding trapezoidal cross-section or, alternatively, the tongue may be of rectangular cross-section and provided with protrusions.

Advantageously each tongue fits tightly within the respective groove to allow adjoining shelves to be mutually aligned accurately. Conveniently, each tongue is provided adjacent the bottom of the respective support member.

Suitably, each support member has a portion adapted, when the support member is engaged with the shelf, to extend substantially vertically above the upper surface of the shelf to act as a bookend.

Advantageously, each support member comprises a substantially vertical pillar member formed integrally with the tongues. Suitably the said portion is a web extending between said pillar and the tongues, in the plane defined by the pillar and the tongues. Conveniently, the web is substantially square.

Advantageously, each support member is provided with mounting means to mount the support member in position, the mounting means comprising at least one key-hole slot adapted to engage a screw or the like protruding from a wall. Preferably the screw is thereby concealed.

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Conveniently, each support member is provided with more than one key-hole slot the key-hole slots being spaced vertically so that the position of the support member relative to the screw may be adjusted. Suitably, the top of the or each key-hole slot is extended laterally, so that the screw may be moved laterally within the key-hole slot with respect to the support member.

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Conveniently, the or each key-hole slot is provided in a back plate adapted to be attached to a vertical rear face of the support member.

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Alternatively, the mounting means of each support member comprises a backplate provided with hook members adapted to engage corresponding slots in a rail member. The rail member may be adapted to be attached to a wall, or may be free standing.

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Conveniently, the backplate is adapted to be secured to the support member in an adjustable vertical position relative thereto, and suitably the backplate is secured to the support member by means of screws or the like passing through vertically oriented elongate slots in the backplate.

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Advantageously, at least one template marking is provided on the support member to assist in the construction of the shelving system.

So that the invention may be more readily understood and so that further features thereof may be appreciated, a shelving system in accordance with the invention will now be described by way of example and with reference to the accompanying drawings, in which:

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FIGURE 1 is a perspective view of one support member and parts of two shelves of a shelving system in accordance with the invention disengaged from one another;

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FIGURE 2 is an enlarged fragmentary vertical section, taken perpendicularly to the plane of the support member, with the shelves and support member engaged with one another;

5 FIGURE 3 is a perspective view of an array of shelves and support members forming a system in accordance with the invention; and

FIGURE 4 is a fragmentary perspective view of another embodiment of the invention.

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The shelving system illustrated in the drawings comprises at least two support members 1 and at least one shelf 2. Figure 1 shows one of the two support members and the adjoining ends of two shelves in a disengaged, or "exploded", orientation such as might obtain before the shelves and support member are engaged with one another.

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The support member 1 comprises an upright generally cuboid elongate pillar member 3, from the bottom of which a tongue member 4 extends horizontally. A vertical generally square planar portion 5 is connected, at the lower edge, to the tongue member 4, and at one vertical edge, to the pillar member 3. The planar portion 5 bisects the tongue member 4 to define two tongues 6 extending outwardly and in opposed directions from the planar portion 5.

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The bottom surface of each tongue 6 is provided with a channel 6a extending parallel to the long dimension of the tongue 6.

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The face of the pillar member 3 remote from the planar portion 5 is provided with a recess 7 which extends over substantially the whole height of the pillar member 3. The lower half of this recess 7 is overlain with a lower back-plate (not shown) which is plain but for lettering giving commercial information. The upper half of the said recess 7 is overlain with a rectangular upper back-plate 8 provided with three elongate holes 9, so that the back-plate 8 may be screwed onto the pillar member 3, and two key-hole slots 10. The holes 9 and key-hole slots 10 alternate with one another and are vertically spaced along the central axis of the plate 8. The holes 9 are each oval with the major axis vertical, so that a degree of vertical

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adjustability of the upper back-plate 8 with respect to the pillar member 3 is possible. Each key-hole slot 10 is adapted to engage a screw (not shown) protruding from a wall (also not shown) in order to support the member 1 on the wall.

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Each key-hole slot 10 comprises a generally circular bottom portion through which the head and shank of the screw may be passed, a constricted portion above the circular portion to allow the shank of the screw, once inserted, to be slidden upwards, and an upper laterally extending portion to allow the screw to be moved laterally with respect to, but not withdrawn from, the key-hole slot 10.

On each side of the pillar member 3, adjacent the upper backplate 8, there is a respective template mark 10a horizontally aligned with the upper laterally extending portion of each key-hole slot 10. The purpose of these template marks will become apparent in due course.

In each end face of the otherwise conventional shelf 2, there is a groove 11 extending horizontally from the rear edge edge of the shelf, for a distance which is approximately three-quarters of the width of the shelf, towards the front edge of the shelf. The groove 11 is generally rectangular in section and this is shown more clearly in Figure 2 of the accompanying drawings. The portion 12 of the shelf lying above the groove 11 is cut back by a small extent so that the portion 13 of the shelf lying beneath the groove extends a little way beyond the portion 12 above the groove, and the purpose of this will beome apparent in due course.

The groove 11 in the shelf 2 is adapted to accommodate a generally longitudinal extruded insert 14 which may be slidden into the groove to lie against all three inside surfaces of the groove 11 and against the end face 15 of the shelf 2 which is above the groove 11. The portion of the insert which lies against the bottom surface of the groove is provided with an upwardly extending rib 16 which extends parallel to the long dimension of the insert 14. When the insert is in place in the groove 11, the shelf 2 may be slidden onto a tongue 6 of the support member 1 so that the insert rib 16 engages the channel 6a of the tongue 5. Alternatively, the rib could be provided on the shelf itself, and the insert could be omitted.

The shelving system is assembled on a wall or the like in the following manner. Firstly a fixing screw is screwed into the wall at a selected location.

5 A shelf 2 is then attached to two support members 1 by sliding each groove 11 of the shelf, containing a respective insert 14, onto a tongue 6 of one of the support members. By virtue of the upwardly extending rib 16 of each insert 14 and the downwardly opening channels 6a of the tongues 6, the shelf engages the support members with a close fit, thus preventing the
10 shelf from being parted from the support members in a direction perpendicular to the plane of the support member 1. It is to be noted that although Figure 2 shows the shelf 2, insert 14 and tongue to be spaced from one another, this is merely for the sake of clarity in the drawing and, in reality, a very close fit is achieved. This close fit enables adjoining shelves
15 to be aligned accurately and assists in allowing a professional standard of construction of the shelving system to be achieved by an amateur. Because the grooves 11 do not extend along the entire length of the respective end of the shelf 2, once the shelf is fully engaged with the respective tongue 6, the tongue is no longer visible and the means by which the shelf is supported by
20 the support member is not immediately apparent by visual inspection alone.

A selected one of the key-hole slots 10 in the upper back-plate 8 of one support member 1 is then engaged with the fixing screw, the key-hole slot which is chosen determining the height of the support member relative
25 to the wall. The extent of the fixing screw which protrudes outwardly from the wall is chosen so that, with the support member 1 supported by the screw, the upright pillar member 3 of the support member is held fairly closely against the wall and therefore the means by which the support member is attached to the wall, namely the arrangement of the upper back-
30 plate 8 and screw, is not immediately apparent to the casual glance.

With one support member thus engaged with a screw protruding from the wall, the whole assembly of shelf and two supports can then be rotated about that screw and then, once the shelf is exactly horizontal, the template
35 marks 10a of the support member 1 remote from the screw can be used to determine the appropriate location of the screw for that support member. Thus pencil or other marks can be made on the wall adjacent the template

marks, and the shelf support can be removed whilst a screw is inserted in the correct position, as dictated by the pencil or other marks on the wall. The entire shelf assembly comprising the shelf and the two supports can then be mounted on the two screws. If it is found that the second screw has
5 been inaccurately located, so that the shelf is not horizontal when mounted on the two screws, the positions of the back plates 8 on the support members 1 may be adjusted by loosening the screws passing through the oval holes 9 and sliding the back plates 8 before re-tightening the screws. Thus the shelf can be made to be exactly horizontal when the support members
10 are mounted on the screws. In addition to the support member 1 being adjustable with regard to its height relative to the wall, as described above, a certain degree of lateral adjustability is allowed for by the laterally extended portion at the top of each key-hole slot 10.

15 It will be appreciated that further shelves can be added to extend the system horizontally and, of course, runs of shelves can be spaced vertically from one another. Such an extended system is shown in Figure 3. Figure 3 is a perspective view from above and one side, and shows inter alia the unbroken front edge of each run of shelves. Adjacent runs of shelves are not
20 directly superimposed and thus there is a gap between adjacent runs; this is not the case with prior shelving systems using vertical rails.

The extended portion 13 lying beneath the groove 11 is such that when two shelves are attached to a support member in the manner described
25 above, the lower portions 13 of the two shelves abut, or almost abut, one another to provide a substantially continuous bottom surface for the shelving system; in addition, that portion of the end face of each shelf 2 which is not provided with a groove that is to say the portion of the end face adjacent the front edge of the shelf, abuts the corresponding portion on the
30 other shelf 2 to provide a substantially continuous front edge for the shelving system.

By virtue of the vertical adjustment of the upper backplate with respect to the support member, the horizontal adjustment of the fixing
35 screw with respect to the key-hole slot 10, and the template marks 10a, a professional standard of inter-alignment of components of the entire shelving system has been found to be able to be achieved by an amateur. If the

vertical position of the shelf is to be changed, the entire assembly can be removed from the wall, and replaced with the screws respectively engaging the other of the key-hole slots on each support.

5 It will be also be appreciated that, when the shelving system described above is attached to a wall, there are no unsightly rails and brackets such as are associated with known shelving systems but, instead, the shelving system appears to comprise simply shelves and the exposed parts of the support members, which look like book ends. The shelving
10 system thus presents an aesthetically pleasing prospect and comprises only two main components: the shelves and the support. It is to be noted that only one type of support is required and this can be used at either end of a run of shelves as well as between shelves.

15 Many variations with respect to the specific example described above are possible to provide a shelving system in accordance with the invention. For example, the tongues 6, instead of being of rectangular section and provided with the channel 6a, could be of trapezoidal section and would thus allow for a dove-tail fit with suitably sectioned grooves 11 without the
20 provision of the insert 14.

 Alternatively, to engage with a trapezoidally sectioned groove 11, the tongues 6 could be of rectangular section but provided with outwardly projecting nibs along the top and/or bottom edges to engage the groove with
25 a tight fit.

 The tongues 6 could be provided along the top edges of the support member 1 instead of along the bottom edges, the grooves in the shelves being appropriately redesigned, and any convenient means for attaching the
30 support member 1 to a wall or the like may be provided in place of the back-plate 8, but it is preferred that the attachment means is concealed when the support member 1 is attached to a wall.

 Instead of there being a continuous tongue 6 along each bottom edge
35 of the support member 1, it would be possible to provide a plurality of outwardly extending tongues, for example short lengths of dowel, and these tongues (or, indeed, the continuous tongue 6 described above) could engage

the respective shelf with a dove-tail fit, a mortice and tenon joint, or any other convenient joint.

In a further embodiment of the invention, the manner of attaching
5 the shelves to the support member is as described above with reference to
Figures 1 and 2, but the support member is mounted in position differently.
Referring to Figure 4, an alternative form of back-plate 17 is used which has
no key-hole slots and which extends for substantially all the height of the
pillar member 3 instead of only half the height. The back-plate 17 is
10 provided with oval elongate screw holes 18 to enable it to be attached to the
pillar member 3, with a degree of vertical adjustment being allowed for.
Two pairs of horizontally spaced hook members 19, one pair adjacent the top
of the back-plate 17 and the other pair adjacent the bottom, are provided on
the back-plate. Each hook member 19 is planar, the plane lying vertically,
15 and comprises an outwardly extending portion which terminates in a down-
wardly extending portion.

The hook members 19 are adapted to engage a vertical support rail 20
in the form of a square section tube having one face, or two opposed faces
20 21, provided with a plurality of vertically spaced pairs of horizontally spaced
slots 22 adapted to engage respective hook members 19. The height of the
support member 3 with respect to the support rail 20 is determined by the
choice of slots 22 into which the hook members 19 are inserted. The support
rail 20 may be attached to a wall or, in order to use two opposed slotted
25 faces 21 of the support rail 20, may be free standing.

The components of any of the shelving systems described above may
be painted or provided with any desirable veneer in order to enhance the
attractiveness of the system, although each shelf may be made of solid
30 wood.

It will be appreciated that in assembling the shelving system in
accordance with the invention and described above, no special tools are
required. In addition, once the system is mounted on a wall, the shelves can
35 be removed by simply sliding them out of engagement with the support
members.

The invention has been described by way of example, with reference to basic, simple embodiments. The shelves may, however, be provided with integral light fittings, or with book support members slidably or otherwise mounted, for example. Thus many improvements and modifications may be
5 effected without departing from the scope and spirit of the invention.

CLAIMS:

1. A shelving system comprising: at least one intermediate support member and at least two end support members, each said support member
5 being adapted to be supported on a wall or the like, the or each intermediate support member having two tongues extending substantially horizontally away from one another, and each end support member having at least one substantially horizontal tongue; and at least two shelves each having two
10 opposed substantially vertical end faces, each such end face having a respective substantially horizontal groove therein adapted to receive, and thus conceal, a respective one of the said tongues, the tongues thus supporting the shelves; the arrangement being such that, when the tongues of the or each intermediate support member are received within respective
15 said grooves of an adjacent pair of shelves, the respective edges of the two shelves remote from the said wall or the like substantially abut one another to define together a substantially continuous front surface.
2. A shelving system according to claim 1 wherein each tongue is provided with a channel extending parallel to the length of the tongue, the
20 channel being adapted to engage a rib which protrudes into the said groove on the respective shelf.
3. A shelving system according to claim 2 wherein an insert is inserted
25 into the said groove of the shelf, the insert carrying the said rib.
4. A shelving system according to any one of the preceding claims wherein each tongue is provided adjacent the bottom of the respective support member.
- 30 5. A shelving system according to any one of the preceding claims wherein each support member has a portion adapted, when the support member is engaged with the shelf, to extend substantially vertically above the upper surface of the shelf and each support member comprises a substantially vertical pillar member formed integrally with the tongues, the
35 said portion being a web extending between the said pillar and the tongues, in the plane defined by the pillar and the tongues.

6. A shelving system according to any one of the preceding claims wherein each support member is provided with mounting means to mount the support member in position, the mounting means comprising at least one key-hole slot adapted to engage a screw or the like protruding from a wall.
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7. A shelving system according to claim 6 wherein the engagement of the or each key-hole slot and the screw is such that the screw is concealed.
8. A shelving system according to claim 6 or 7 wherein each support member is provided with more than one said key-hole slot, the key-hole slots being spaced vertically so that the position of the support member relative to the screw may be adjusted.
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9. A shelving system according to any one of claims 6 to 8 wherein the top of the or each key-hole slot is extended laterally, so that the screw may be moved laterally within the key-hole slot with respect to the support member.
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10. A shelving system according to any one of claims 1 to 5 wherein each support member is provided with mounting means to mount the support member in position, the said mounting means comprising a backplate provided with hook members adapted to engage corresponding slots in a rail member.
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11. A shelving system according to any one of the preceding claims wherein at least one template marking is provided on the support member to assist in the construction of the shelving system.
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AMENDED
CLAIMS

CLAIMS:

- 5 1. A shelving system comprising: at least one intermediate support member and at least two end support members, each said support member being adapted to be supported on a wall or the like, the or each intermediate support member having two tongues extending substantially horizontally
10 away from one another, and each end support member having at least one substantially horizontal tongue; and at least two shelves each having two opposed substantially vertical end faces, each such end face having a respective substantially horizontal groove therein adapted to receive, and thus conceal, a respective one of the said tongues, the tongues thus
15 supporting the shelves, each tongue being provided with a channel extending parallel to the length of the tongue, the channel being adapted to engage a rib which protrudes into the said groove on the respective shelf; the arrangement being such that, when the tongues of the or each intermediate support member are received within respective said grooves of an adjacent pair of shelves, the respective edges of the two shelves remote from the
20 said wall or the like substantially abut one another to define together a substantially continuous front surface.
2. A shelving system according to claim 1 wherein an insert is inserted
25 into the said groove of the shelf, the insert carrying the said rib.
3. A shelving system according to any one of the preceding claims wherein each tongue is provided adjacent the bottom of the respective
30 support member.
4. A shelving system according to any one of the preceding claims wherein each support member has a portion adapted, when the support member is engaged with the shelf, to extend substantially vertically above the upper surface of the shelf and each support member comprises a
substantially vertical pillar member formed integrally with the tongues, the
said portion being a web extending between the said pillar and the tongues, in the plane defined by the pillar and the tongues.

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5. A shelving system according to any one of the preceding claims wherein each support member is provided with mounting means to mount the support member in position, the mounting means comprising at least one key-hole slot adapted to engage a screw or the like protruding from a wall.

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6. A shelving system according to claim 5 wherein the engagement of the or each key-hole slot and the screw is such that the screw is concealed.

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7. A shelving system according to claim 5 or 6 wherein each support member is provided with more than one said key-hole slot, the key-hole slots being spaced vertically so that the position of the support member relative to the screw may be adjusted vertically by selecting an appropriate keyhole slot to engage the screw.

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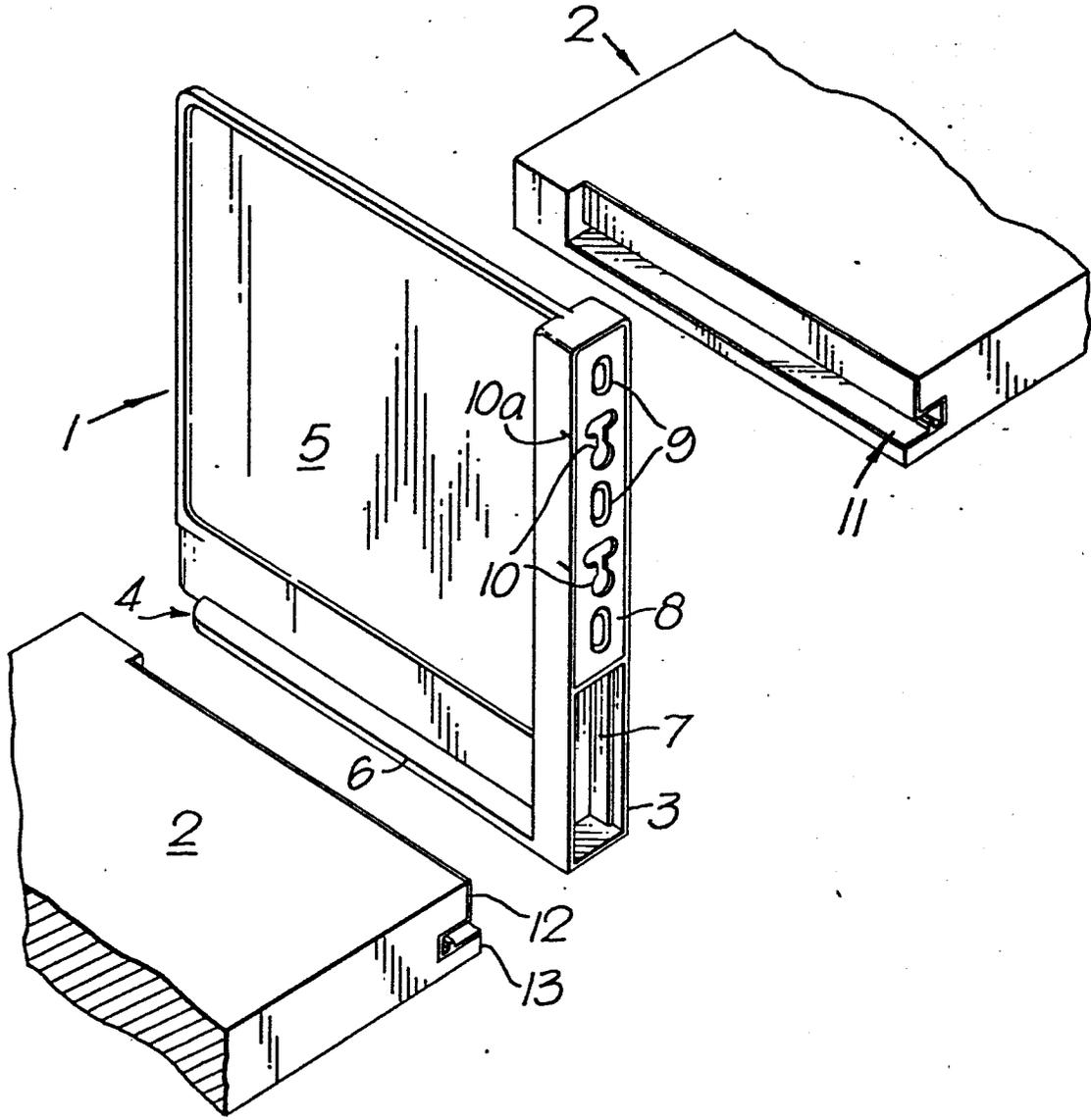
8. A shelving system according to any one of claims 5 to 7 wherein the top of the or each key-hole slot is extended laterally, so that the screw may be moved laterally within the key-hole slot with respect to the support member, to enable the position of the support to be adjusted laterally relative to the screw.

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9. A shelving system according to any one of claims 1 to 4 wherein each support member is provided with mounting means to mount the support member in position, the said mounting means comprising a backplate provided with hook members adapted to engage corresponding slots in a rail member.

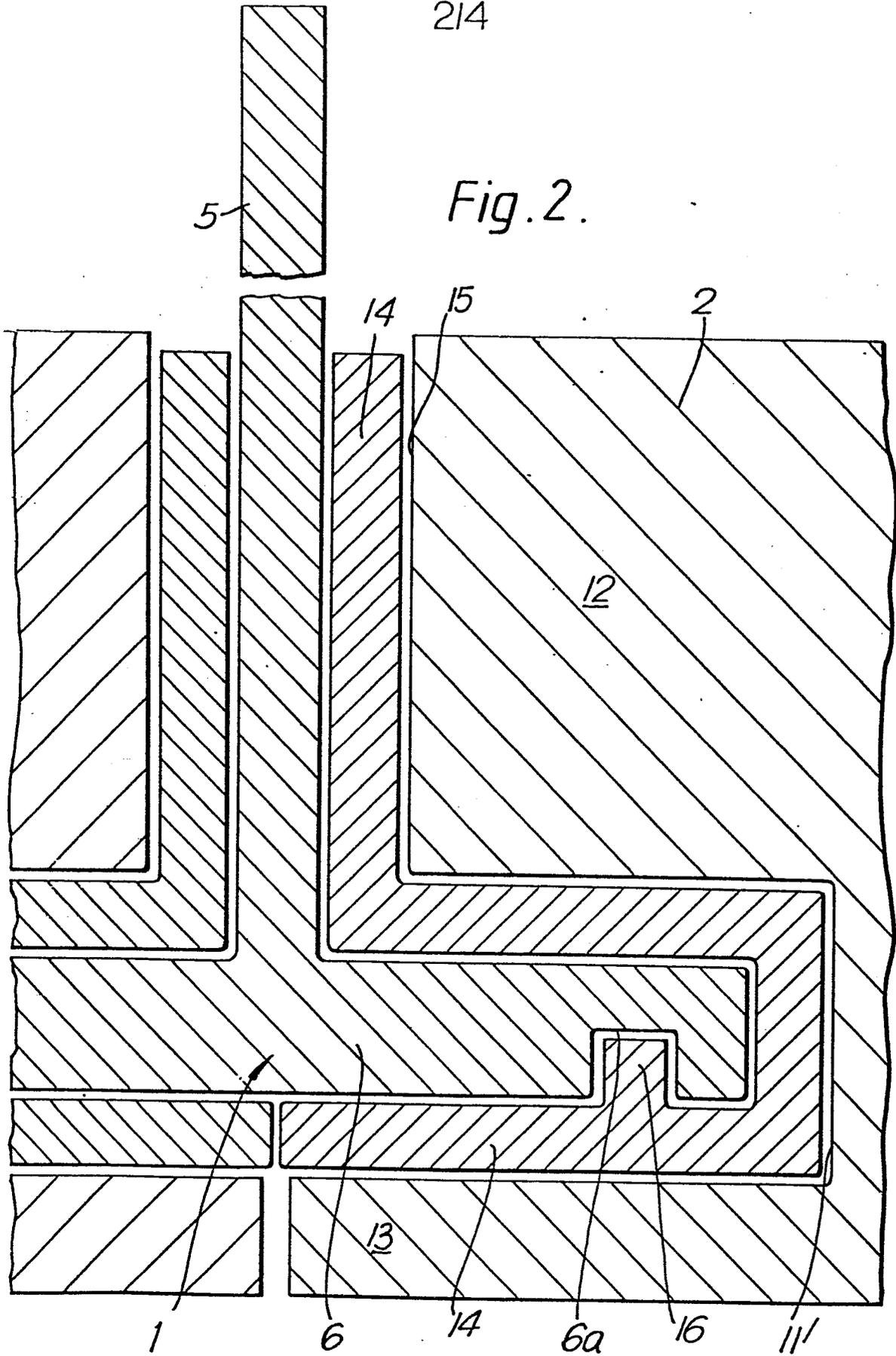
10. A shelving system according to any one of the preceding claims wherein at least one template marking is provided on the support member to assist in the construction of the shelving system.

Fig. 1.



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Fig. 2.



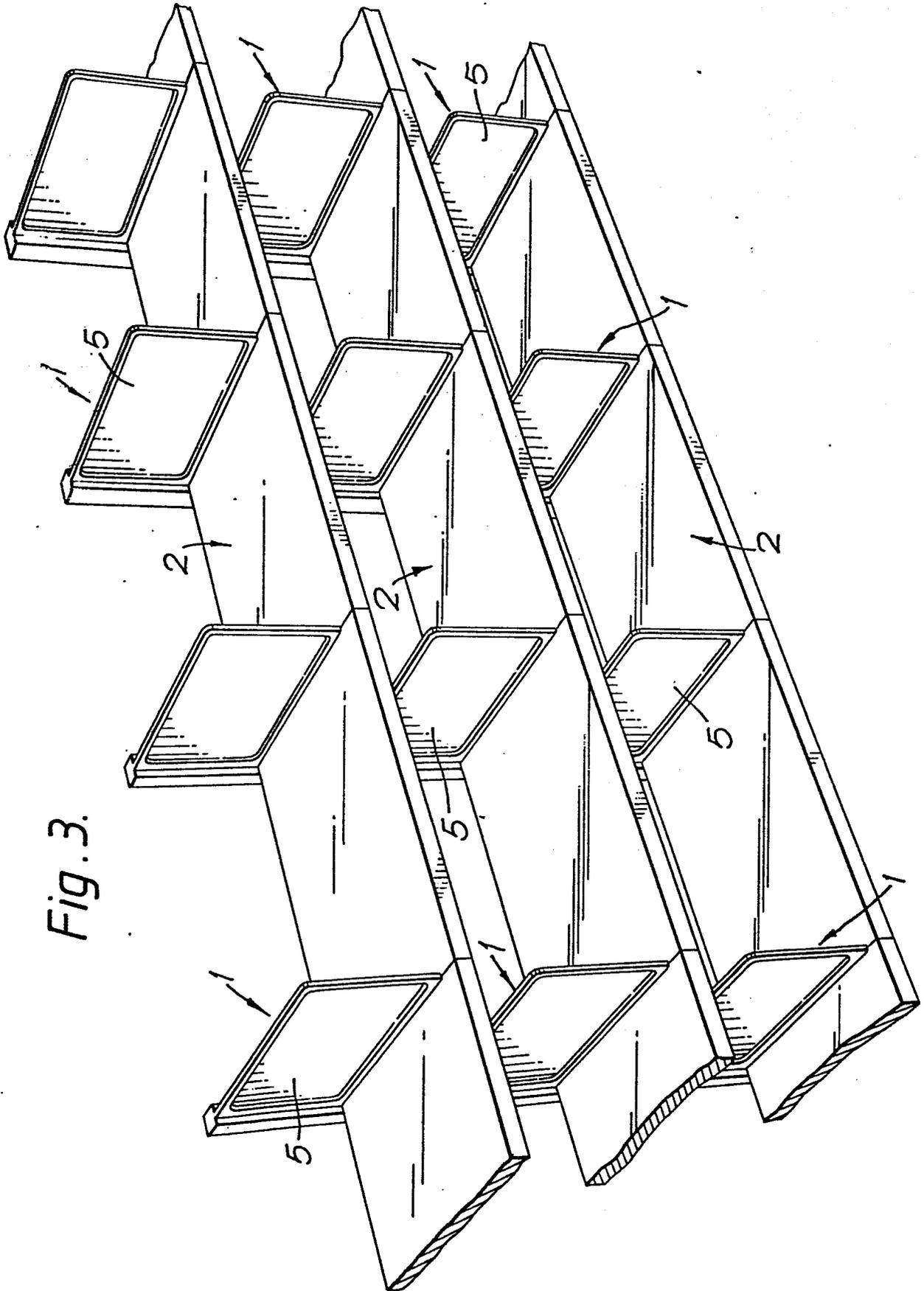
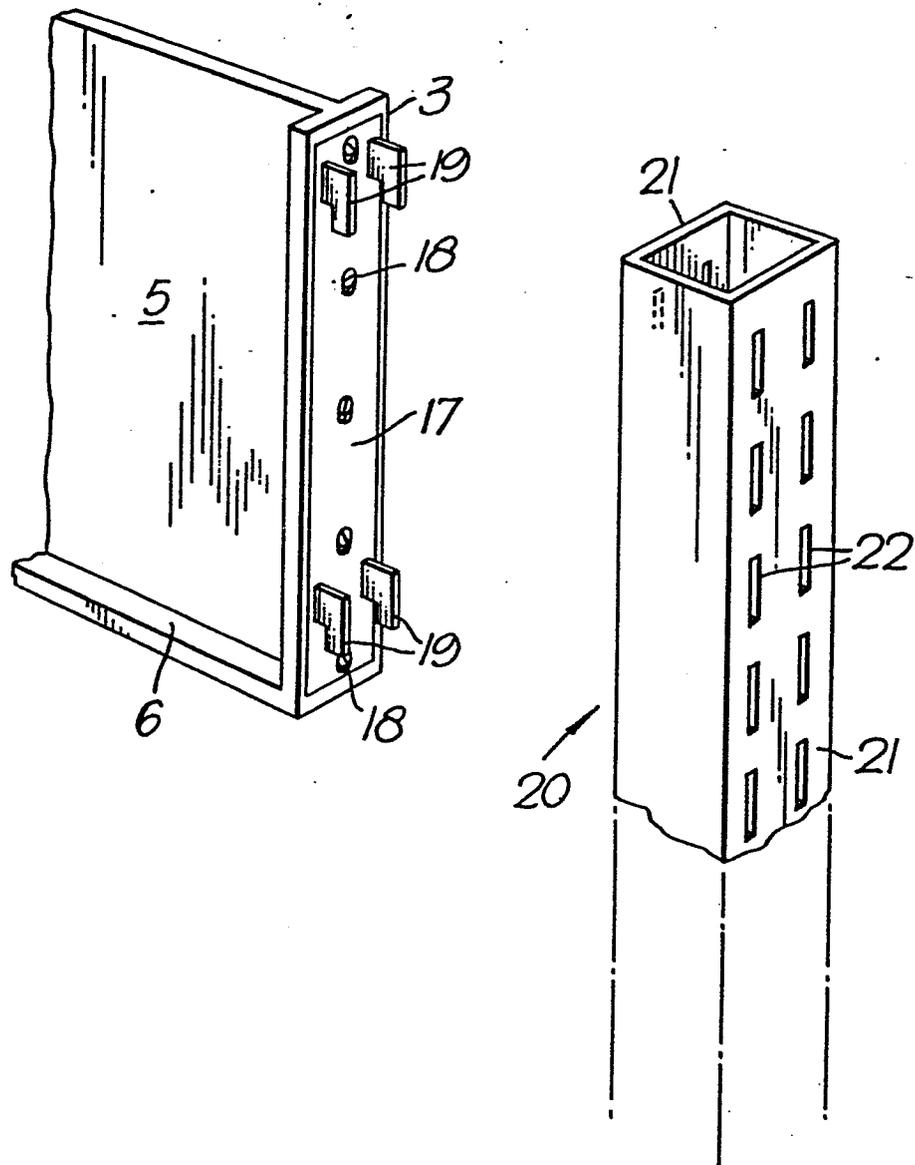


Fig. 3.

Fig. 4.





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
X	<p style="text-align: center;">---</p> US-A-2 837 219 (FERDINAND) *Column 2, lines 26-38; figures 1,4*	1	A 47 B 96/02 A 47 B 96/06
X	<p style="text-align: center;">---</p> GB-A- 780 467 (LUNDQUIST) *Page 2, lines 78-89; figure 1*	1,5	
X	<p style="text-align: center;">---</p> GB-A-2 042 876 (HARDING) *Page 1, lines 77-100; figures 1-3*	1,10	
A,D	<p style="text-align: center;">---</p> GB-A-1 137 675 (MASSEY-FERGUSON) *Figures 1,7*	2,3	
			TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
			A 47 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 18-02-1983	Examiner SCHMITTER BERNARD
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			