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BRACING ELEMENTS AND DEMOUNTABLE BUILDINGS EMPLOYING SAME

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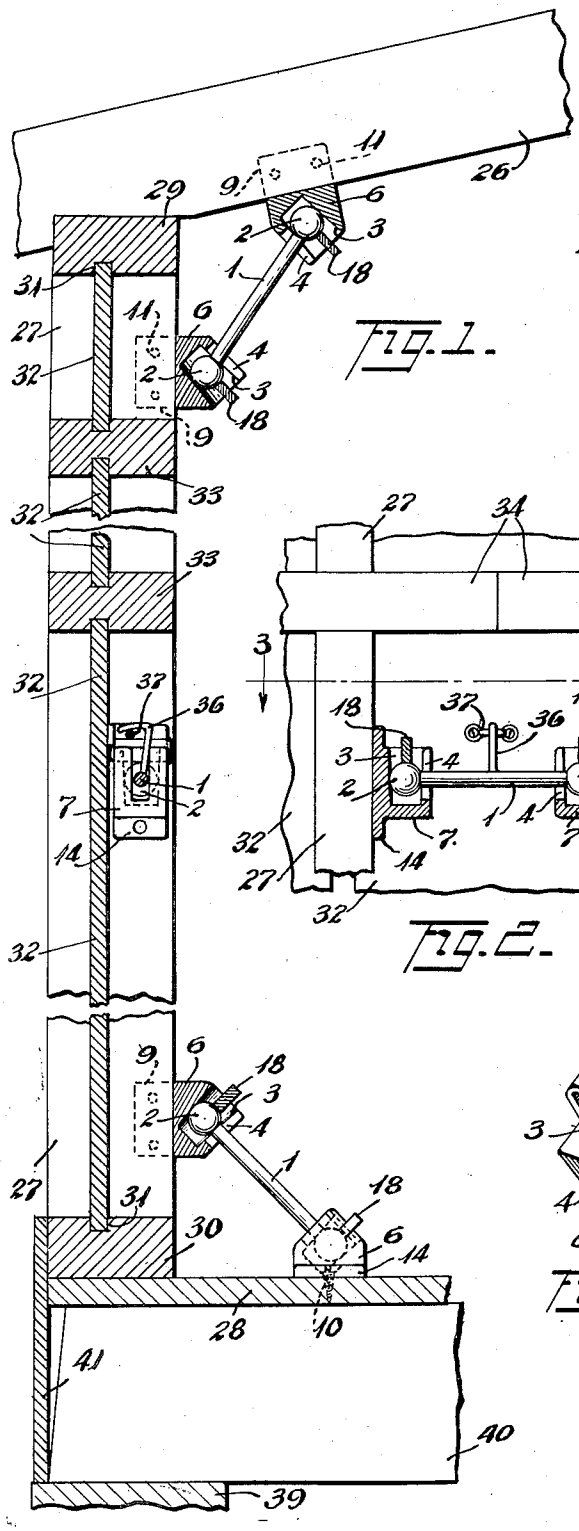


Fig. 1.

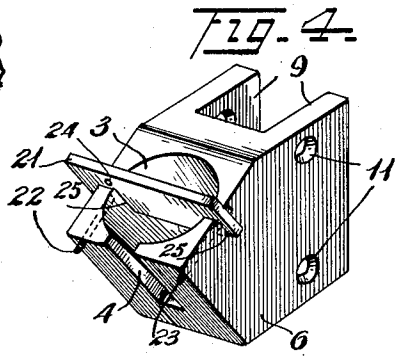


Fig. 4.

Fig. 2.

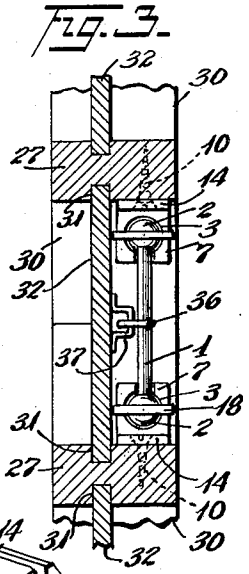


Fig. 3.

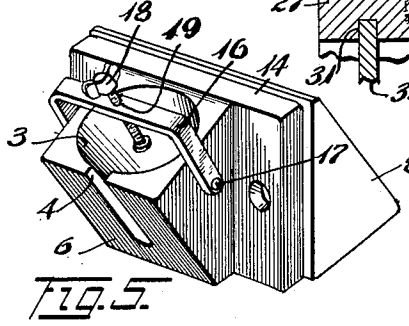


Fig. 5.

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3 Claims. (Cl. 20—2)

This invention relates to bracing elements and interlocking bracing elements for buildings, and more specifically it is directed to interlocking bracing elements for small buildings and such demountable buildings having structural elements removably secured with the bracing elements.

An object of this invention is to provide interlocking bracing elements securing building elements in predetermined relationship.

Another object of this invention is to provide spacer bracing elements locking frame elements of a building in proper position.

Another object of this invention is to provide an interlocking bracing element to position and secure building frame members in proper relationship without other fastening means.

Another object of this invention is to provide novel construction materials for rapidly assemblying and dismounting small buildings having rigid structure when assembled.

A further object of this invention is to provide bracing elements of the class described to position building frame members in proper relation for nailing, bolting or otherwise fastening.

A still further object of this invention is to provide an apparatus of the class described which will be simple and economical in construction, and efficient and durable in use.

Other and further objects and advantages of this invention will become more apparent from reading the following specification in conjunction with the drawings, forming a part thereof, wherein:

Fig. 1 is a broken vertical sectional view of a building wall secured with horizontal and angular bracing elements of this invention, parts removed and parts shown in elevation for clarity;

Fig. 2 is an inside elevation view of a section of a building wall showing horizontal bracing elements securing vertical elements and wall panels therebetween, parts removed and parts in sections, for clarity;

Fig. 3 is a horizontal cross-sectional view taken along line 3—3 of Fig. 2;

Fig. 4 is a perspective view of one embodiment of socket element of interlocking bracing elements for angularly positioned building elements; and,

Fig. 5 is a perspective view of a modified embodiment of socket element of interlocking bracing elements for angularly arranged elements with wedge adapter for use of angular socket with parallel building elements.

Referring to the drawings, wherein like members are given the same reference number, a bar 1 is provided with an extension 2 at each end thereof. The extension section 2, which preferably is cast integral with the bar 1, may be of any desired size and shape, such as spherical, conical, frusto-conical, or diamond-shaped. These extensions 2 are received by sockets 3, preferably with tapering side walls, whereby the extensions 2 and sockets

3 provide a cam surface securing relationship. The socket 3 is provided with a longitudinal slot 4 to receive the bar 1 when the extensions 2 are inserted in the sockets 3.

The sockets 3 are angularly positioned, preferably at 45 deg., in a member 6 which is perpendicularly secured to a building element which is angularly positioned with respect to another building element to which it is to be secured. The sockets 3 are perpendicularly positioned in a member 7 when the bar 1 and extensions 2 are employed to secure building elements together which are parallel or in the same plane.

Another embodiment, whereby angularly positioned sockets 3 can be used to secure building elements, which are in the same plane, is illustrated in Fig. 5, where a wedge-shaped element 8 having the angle thereof equal to the angle of the socket 3 to position the socket 3 substantially parallel to the building element.

The socket 3 in the members 6 and 7 is secured to a building element in any suitable manner, such as brazing, welding, and integrally cast, particularly when metallic, such as aluminum, elements are used in forming standard size demountable building. The preferred methods of securing for use with wood elements by a laborer in forming a single unit, is to provide the members 6 and 7 with integral parallel flanges 9 defining a channel therebetween adapted to receive the building element therebetween, and secure the flanges 9 to the building element with screws 10, as illustrated, or nails, or nuts and bolts extending through apertures 11 in the flanges 9. Another type of flange 14, as illustrated in Fig. 5, may be provided on the members 6 and 7, in the form of a flat flange adapted to fit flush with the face of the building element and be secured thereto by nails, screws or nuts and bolts extending through the apertures 11 in the flange 14.

Means are provided on the members 6 and 7 to fasten the extensions 2 in the sockets 3 and prevent accidental removal of the extensions 2 from the sockets 3. One such means, as shown in Fig. 5, is a saddle bracket 16 having each end connected to the member 6 by a pivot bolt 17. A thumb bolt 18 threadedly engages a tapped aperture 19 in the central section of the bracket 16 to position the end of the bolt 18 in socket 3 and abut an extension 2 positioned therein.

Another means of fastening the extensions 2 in the sockets 3 is illustrated in Fig. 4. In this embodiment, a bar 21 is inserted in diametrically opposed grooves 25 in opposed walls of the socket member 6 and pivoted by a pin 23 to the member 6. The free end of the bar 21 is removably fastened to the member 6 in any convenient conventional manner, such as a removable pin 22 extending into the member 6 and through one of a series of apertures 24 in the bar.

Other angular positioning means for the sockets 3 may be used. The required feature is that any two cooperating sockets 3 have substantially parallel longitudinal axes to receive extensions 2 on the same bar 1.

In operation, the device of this invention is simple and easy, and can be used by unskilled persons without any special tools. In Fig. 1, there is illustrated wall section of a building in which the rafter beam 26 is secured to the vertical stud column 27 by the bar 1 and socket 3 bracing elements of this invention. The cross beam or flooring 28 may likewise be secured to the vertical stud column 27 by the bar 1 socket 3 bracing elements, as may the perimeter beams, particularly at corners.

Adjacent vertical stud columns 27 may be secured together, or, for that matter, parallel stud columns with one or more stud columns therebetween may be secured together as a unit, by the rod 1 and socket 3 assembly of

this invention. As illustrated in Figs. 2 and 3, the members **7** are mounted so that the sockets **3** are substantially parallel in longitudinal axes, and receive the extensions **2** on the bar **1** to secure the vertical stud columns **27** together. The tapering sidewall of the sockets **3** provide a camming action with extensions **2** to effect a tight rigid connection.

These assemblies are likewise used between parallel beams, and at corners to make a small demountable building rigid when assembled.

Included within the scope of this invention is small demountable building formed in sections fastened together with the assemblies of this invention. Accordingly the frame structure, including the perimeter beams, **29** top and **30** bottom, are provided with grooves **31** to receive a panel **32**.

The panel **32** may be provided with cross-members **33** for reenforcing strength, and may be provided with extension-members **34**, see Fig. 2, which overlap the adjacent vertical stud column **27** and adjacent half of panel **32** to further reenforce a demountable building.

The panels **32** may be of wood or metal, such as plywood and aluminum, and may have transparent sections of glass or plastic. Likewise jalousies may be used in sections of these panels, and door elements may comprise a panel.

A hook projection **36** is provided on the bar **1** adapted to engage an eye or bracket **37** on the panel **32** to hold the panel against vertical movement while sections are being assembled, and to further strengthen a demountable building when assembled.

A demountable building, such as storage buildings, military field installations, camp building, concession stands, and the like, may be quickly and easily assembled and demounted using the elements of this invention, on a temporary or permanent foundation. The foundation is indicated in the drawings generally as footings, pillars or pilings **39**, slab **40**, and trim **41**, which trim may also be formed as panel part, if so desired.

The bracing elements of this invention are equally useful in spacing construction members in proper position and fastening such members in proper position for permanent securing in a conventional manner. The device of this invention is particularly useful to a semi-skilled laborer in construction of building.

The invention has been described in detail, but it is clearly understood that the invention is not so limited; many changes can be made therein without departing from the spirit and scope of the invention, as defined in the appended claims.

Having thus described the invention what is desired to secure by grant of U. S. Letters Patent, is:

1. A bracing element comprising a bar, a shaped extension on each end of said bar, a pair of members, a tapered socket in each member adapted to receive one of said extensions on said bar, means removably fastening said pair of members to building elements, and means removably fastening said extensions in said sockets comprising a bracket pivotally connected to said member, and a thumb screw threadedly engaging said bracket and positioned to abut said projection when said projection is seated in said socket.

2. A bracing element for fastening a pair of vertical stud columns and a panel therebetween comprising a bar, shaped extensions on each end of said bar, a pair of tapered socket members, said socket member secured one to each said column in a manner to position the longitudinal axes of said socket member substantially parallel, said socket members being so constructed as to receive said extensions in cam relationship, a projection extending upwardly from said bar, a bracket secured to the panel and constructed and arranged to receive said projection, and means releasably fastening said extensions in said sockets.

3. A demountable building comprising wall units, and roof units constructed to be joined to form walls and roofs, said units comprising beams and columns grooved to receive slidable panels therein, and interlocking bracing members fastening said building units in predetermined removable fastened relationship, said interlocking bracing members comprising a pair of tapered socket members secured to adjacent abutting building units, a bar, tapered extensions on each end of said bar constructed and arranged to engage said socket members, and pivotally mounted clamp means locking said extensions in said sockets.

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