March 10, 1936. C. TRAMILL 2,033,404

SECTIONAL FLOOR

Filed April 20, 1933 2 Sheets-Sheet 1

Fig. 5.

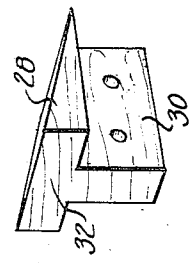


Fig. 1.

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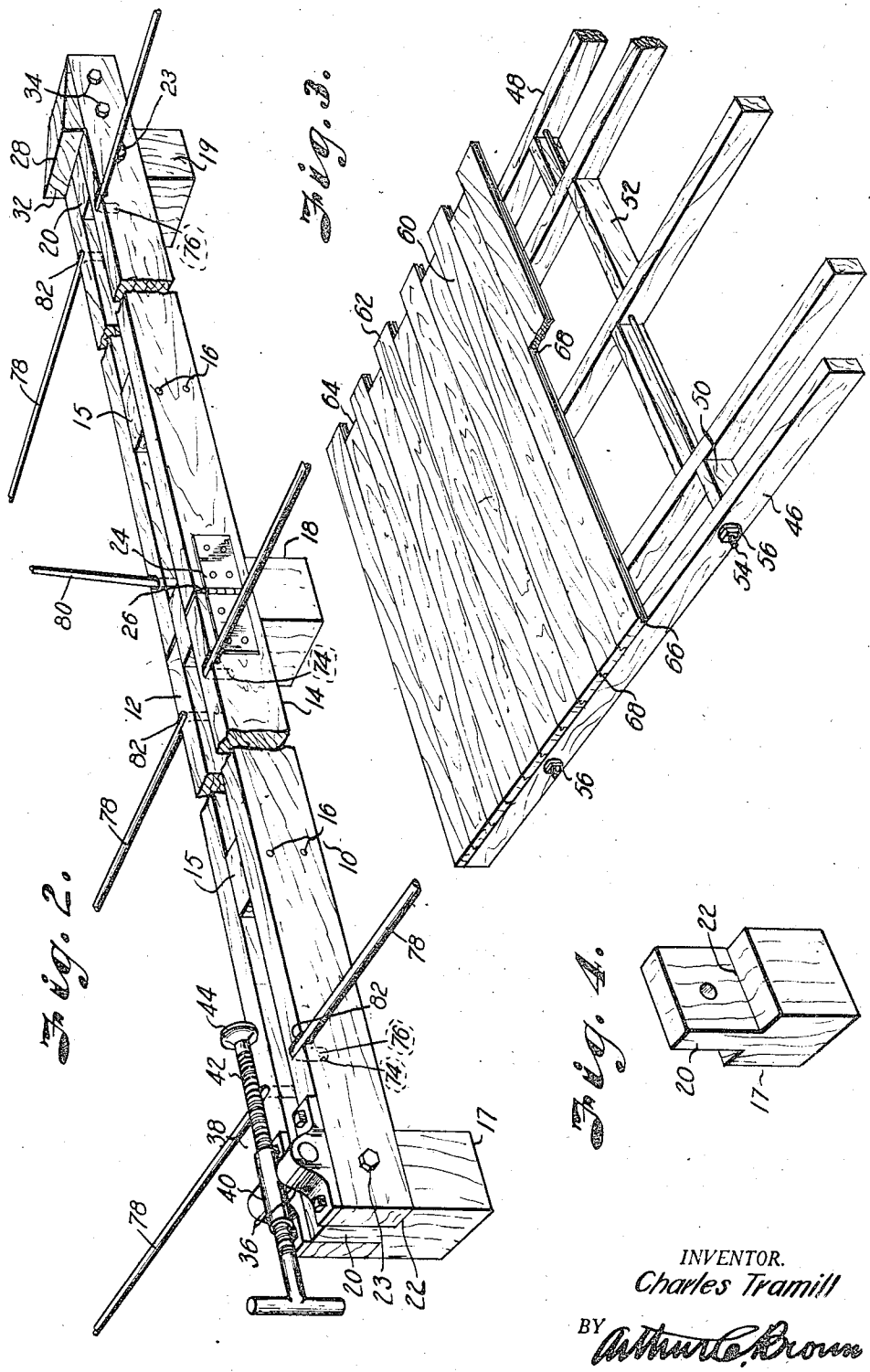


Fig. 2.

Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE

2,033,404

SECTIONAL FLOOR

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9 Claims. (Cl. 20—6)

This invention relates to floors and more particularly to removable floors including platform-like sections that may be installed when wanted and disassembled for storage.

The principal objects of this invention are to interlock sections of removable flooring and to securely retain floor sections and supporting means in firm engagement when installed for enhancing the stability without reducing the resilience of the floor.

Other objects of the invention will be apparent in the course of the following description of one form of apparatus embodying the invention and illustrated in the accompanying drawings wherein:

Fig. 1 is a perspective view of a floor comprising supporting members and surfacing sections constructed in accordance with this invention, the board surface being partly broken away and selected board-supporting strips being shown fragmentarily to better illustrate the supporting structure.

Fig. 2 is an enlarged perspective fragmentary view of one of the supporting members illustrating an anchor and a clamp for locking the surfacing sections in supported position.

Fig. 3 is a perspective view of a board supporting frame mountable on the supporting members shown in Fig. 2, some of the boards being removed and one being shown fragmentarily to better illustrate construction.

Fig. 4 is a perspective view of one of the footing blocks of the jointed floor-supporting strips.

Fig. 5 is a perspective view of an abutment block mounted at one end of a floor-supporting strip.

Referring more in detail to the drawings:

10 designates jointed elongated base or floor supporting members each comprising hingedly connected end abutting pairs of parallel spaced strips 12 and 14 having substantial width and arranged on edge to form tying girders. Spacing blocks 15 are located between the strips of each pair and fixed thereto by pins 16 to hold the strips together. Footing blocks or pillars 17, 18 and 19 are provided with central upwardly projecting tongues 20 insertable in the slots formed by the spaced strips and forming shoulders 22 on which the strips may rest.

The pillars 17 are mounted in similar ends of hinged pairs of strips, the pillars 18 are located at the joints, and the pillars 19 are located in slightly spaced relation with the opposite ends of the hinged pairs of strips to leave the ends of the slots free for mounting anchor members or lugs therein as later described. The spacing blocks 15 may be located in suitable position to serve as guides for locating the pillars.

The respective pillars are formed in suitable heights and shapes to engage portions of any irregular supporting surface and level the girders.

The pillars 17 and 19 at the ends of the jointed girders are preferably removably attached to the strips by suitable means such as bolts 23. The pillars 18 at the joints may be removably mounted on one of the strips of a pair to be carried by the pair when the girders are hingedly moved to be opened or folded, and the pairs of strips are disassembled or reassembled. The tongues of the pillars 18 overlie the abutting end portions of the hinged strips and reinforce the joints.

The hinged connection between end-abutting pairs of strips forming a girder is provided by hinges 24 having straps mounted on the outer faces of aligned strips and pivotally connected by removable hinge pins 26 whereby the girder members may be folded laterally. Hinges are preferably provided on both sides of the jointed girder, whereby the pins of either of opposed hinges may be removed for folding the girder on the opposite hinge.

The anchor members above referred to comprise lug-like blocks of wood, illustrated in detail in Fig. 5, and including wedge-shaped bodies 28 resting on the ends of the strips and tongues 30 depending from the bodies into the ends of the slots between the pair of strips, to form vertical abutment faces 32 for one edge of flooring sections mounted on the girders as presently described. The abutment lugs are secured to the strips by bolts 34.

Brackets 36 fixed to the upper edge faces of the strips at the opposite ends of the girders from the abutments 28 support shafts 38 forming pivotal mountings for internally threaded sleeves 40, and screws 42 mounted in the sleeves have swivel heads 44 engageable with one side of the flooring to clamp the flooring against the anchor block abutments.

The surfacing members of the floor include frames comprising parallel spaced bars such as 46 and 48, and sets of spacing blocks or strips 50 and 52 located between the bars and in staggered relation to permit clamping rods 54 to pass alternately behind and in front of adjacent blocks as best shown in Fig. 3.

The rods are straight and located in holes in the frame bars and have anchor means on oppo-

site ends engaging outer faces of outside bars of each frame, for example nuts **56** threaded on the ends of the rods which may be moved to tightly clamp the frame bars and spacing blocks in assembled relation.

The floor frames may consist of any desired number of parallel bars and sets of spacing blocks, and preferably will include at least four bars and two longitudinally spaced sets of blocks to provide a floor section of substantial area that will be light in weight and held together to form a unit.

In Fig. 3 a frame is shown having five bars and two sets of spacing blocks. Attention is called to the alignment of the first and third blocks and second and fourth blocks in the set exposed in the figure, whereby any tension or stress due to tightening of the nut on the bolt will be substantially equally distributed on both sides of the bolt and distortion of the frame will be avoided. The bars and blocks comprise strips of wood having substantial width and arranged on edge, whereby the ends of the blocks abut the sides of the bars, and stiffen the structure against vertical bending strains.

The plurality of bars comprising the type of frame shown in Fig. 3, are preferably arranged in groups of differently spaced bars whereby two bars at one side of a frame may be narrowly spaced to add rigidity and form socket-like recesses into which the ends of adjacent frame members may extend.

Another type of floor frame is shown at the lower right hand corner of the floor in Fig. 1, having the same width as the above described frame, and substantially equally spaced bars, including intermediate bars arranged in staggered relation with the intermediate bars of the aligned frame as clearly shown in the figure.

The inner ends of the intermediate bars of each frame extend beyond the ends of side bars, and side bars of end abutting frames abut and are located on the relatively wide support formed by spaced strips **12** and **14** of the girders, and the intermediate bars overlap and extend substantial distances beyond the supporting girders. The outer ends of all bars of a frame at one end of a floor assembly are aligned as indicated at the left end of Figs. 1 and 3.

Flooring is laid transversely on the frames including boards **60** having end edges registering with the outer faces of the longitudinal side bars as shown in Figs. 1 and 3 for side edges of a floor assembly, and opposite ends projecting beyond the opposite longitudinal side bar. Alternate boards are elongated to provide projecting tongues **62** and notches **64** between the tongues whereby the tongues of one floor section may be mounted in the notches of another to interlock the edge abutting sections as shown in Fig. 1, and form a dovetailed floor.

Attention is called to the close proximity of the ends of the shorter boards to the side bars of the frames whereby two frames may be laid relatively close together and the free ends of the boards will extend relatively short distances from the supports.

The dovetailed or interlocking relation of side edge abutting floor sections therefore not only avoids a continuous crack in the floor but assures substantial support for at least half of the projecting board ends.

The rigidity of the longitudinal area of the floor between adjacent side members of adjacent floor frames is further promoted by the use of floor boards having edge grooves **66** and tongues **68** seated in the grooves whereby the tongues help to support the free ends of the boards.

The boards are preferably toe-nailed to the frame bars in the usual manner of laying floors, to form flooring sections that may be laid on the girders and moved slidably thereon into desired position.

Attention is particularly called to the differential lengths of floor frames and assemblies of surfacing boards nailed thereto, whereby adjacent longitudinally arranged floor sections overlap, as indicated in Fig. 1. The floor shown in this figure includes five pointed tying girders or floor supporting members, and three longitudinal series of floor frames or sections arranged side by side. The intermediate series of floor sections has boards dovetailed with boards of the adjacent outer sections. The end floor sections of this intermediate series, shown at the right and left ends of the figure, are shorter than the adjacent outside sections, and a long section extends between the two short sections to complete the middle series of floor sections. The joint **70** between end-abutting intermediate floor sections thus lies between the ends of the adjacent outside floor sections, and the joint **72** between end-abutting outside sections lies between the ends of the long intermediate section.

It is apparent therefore that the joints of adjacent floor sections are staggered or broken, and that when the ends of floor boards of adjacent floor sections are interlocked in dovetailed relation, the longitudinally aligned sections of a series will be held firmly together. The use of supplementary means such as bolts or cables for preventing separation of end abutting floor sections is thus obviated. When the laterally operating clamps have been set to hold the series of sections against lateral displacement, the dovetailed floor boards will securely lock all of the floor sections against displacement on the girders.

In order to square the assembly of girders and assure parallelism and proper spacing therebetween, vertical sockets or holes **74** are formed in the strips **12** and **14** at numerous positions therealong, and downbent ends **76** of spacing bars **78** are mounted in selected sockets as clearly shown in Figs. 1 and 2, and similar hook-like or anchor ends of diagonal bars **80** are mounted in other of said sockets to maintain the girders parallel.

Recesses **82** formed in the upper faces of the strips adjacent the sockets form seats for offsetting the bars below the plane of the upper surfaces of the girders to permit the floor sections to lie on the girders and slide thereover.

The use of spacing and squaring bars further assures alignment of the abutment faces **32** of the anchor blocks in a vertical plane, so that the outer edge of an assembly of floor sections may accurately overlie the faces of the abutments and be pressed thereagainst by the clamps.

The spacing bars are preferably distributed along a pair of adjacent girders so that each member of a jointed girder will be connected by one or more bars with a member of an adjacent jointed girder. A single diagonal bar will be sufficient to square a pair of girders.

In using the invention the supporting girders may be constructed and assembled with sufficient hinged arms or sections to provide a support for a floor of a desired area; in the illustrated application of the invention, each of the five floor supporting girders consisting of two arms. The

girders may therefore be folded into one-half the length of the extended base.

A suitable number of frames provided with surfacing boards fixed thereto may be arranged on spaced supporting girders, the projecting ends of frame bars extending beneath the boards of end-abutting floor sections and between the bars of said sections, and side frame bars in end abutting relation with the similar bars of end abutting sections.

The several frames may be moved longitudinally on the girders to effect assembly and to engage the tongue of a board at the end of one section in the groove of the board of the next end abutting section, as suggested at **70** and **72** in Fig. 1. The sections may be shifted laterally to effect interlocking engagement between abutting longitudinal edges of the sections, so that each pair of end-abutting sections may be locked together by the dovetailed engagement of an adjacent single section with said pair of sections.

The screws mounted on the outer ends of the girders may then be operated to engage the heads thereof with the outer faces of the side bars of adjacent floor sections and operation of the screws will shift the entire assembly of floor sections laterally into engagement with the anchors at the opposite side of the assembly.

Operation of the screws will further press the side edge tongues of floor sections into the notches of edge-abutting sections and thus enforce the interlocking relation of the sections and make tight joints between edge-abutting sections.

What I claim and desire to secure by Letters Patent is:

1. A sectional floor including a plurality of supporting members each consisting of hinged sections and having aligning recesses at said hinge connections, pillars supporting said members and provided with tongues engaging in the aligning recesses and overlapping said hinge connections to prevent hinging movement of the supporting members, a plurality of floor sections mounted on said members, and means mounted on the supporting members for retaining the floor sections in abutting relation.

2. A sectional floor comprising supporting members, each including a plurality of hingedly connected sections comprising spaced strips and means for retaining the strips in spaced relation, pillars supporting said members and having portions extending between said spaced strips at said hinge connections and floor sections mountable on said supporting members.

3. In a sectional floor including girders and flooring mountable on the girders, anchors at one end of the girders, and screws threadedly engaged with the opposite end of the girders for clamping the flooring to said anchors.

4. In a sectional floor, a surfacing member, supporting means including a plurality of spaced members, anchors fixed to one of the outer ends of said supporting members, and means including brackets mounted on the opposite ends of said supporting members and screws threaded in the brackets for clamping the surfacing member to the supporting means.

5. In a sectional floor, supporting means including a pair of girders and abutments at the outer ends of the girders, a plurality of members having portions engageable with the girders for aligning the abutments, a floor section for mounting on the girders to engage the abutments, and means for holding the floor section in engagement with the abutments.

6. A floor support including a girder comprising a pair of sections having spaced portions at the ends thereof, means hinging the sections in abutting relation, and means closely engaging between said spaced portions and overlapping said hinged connection to prevent hinging movement of the girder sections.

7. A floor support including a girder comprising sections having spaced parallel members, means for retaining said members in fixed spaced relation, means for hinging the sections together, and key means engageable between said members and overlapping said hinge connection for preventing hinging movement of said sections.

8. A floor support including a girder comprising a pair of sections having spaced portions at the ends thereof, means hinging the sections in abutting relation, key means engaging between said spaced portions at the hinged connection for preventing hinging movement of said sections, an anchoring member mounted on the end of one of the sections, and a clamping screw member mounted on the opposite end of the other section for clamping a floor therebetween on the girder.

9. A floor support including a girder comprising a pair of sections having spaced portions at the ends thereof, means hinging the sections in abutting relation, means engaging between said spaced portions and overlapping the hinged connection for preventing hinging movement of said sections from extended abutting alignment, an anchor having a depending tongue portion extending between the spaced portion at the outer end of one of the sections, means for securing said tongue to said section, and a clamping screw fixed to the outer end of the other section for cooperating with the anchor to clamp a floor therebetween on the girder.

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