June 4, 1935. R. C. WALKER 2,003,671

BOOK STACK CONSTRUCTION

Filed April 5, 1933 3 Sheets-Sheet 1

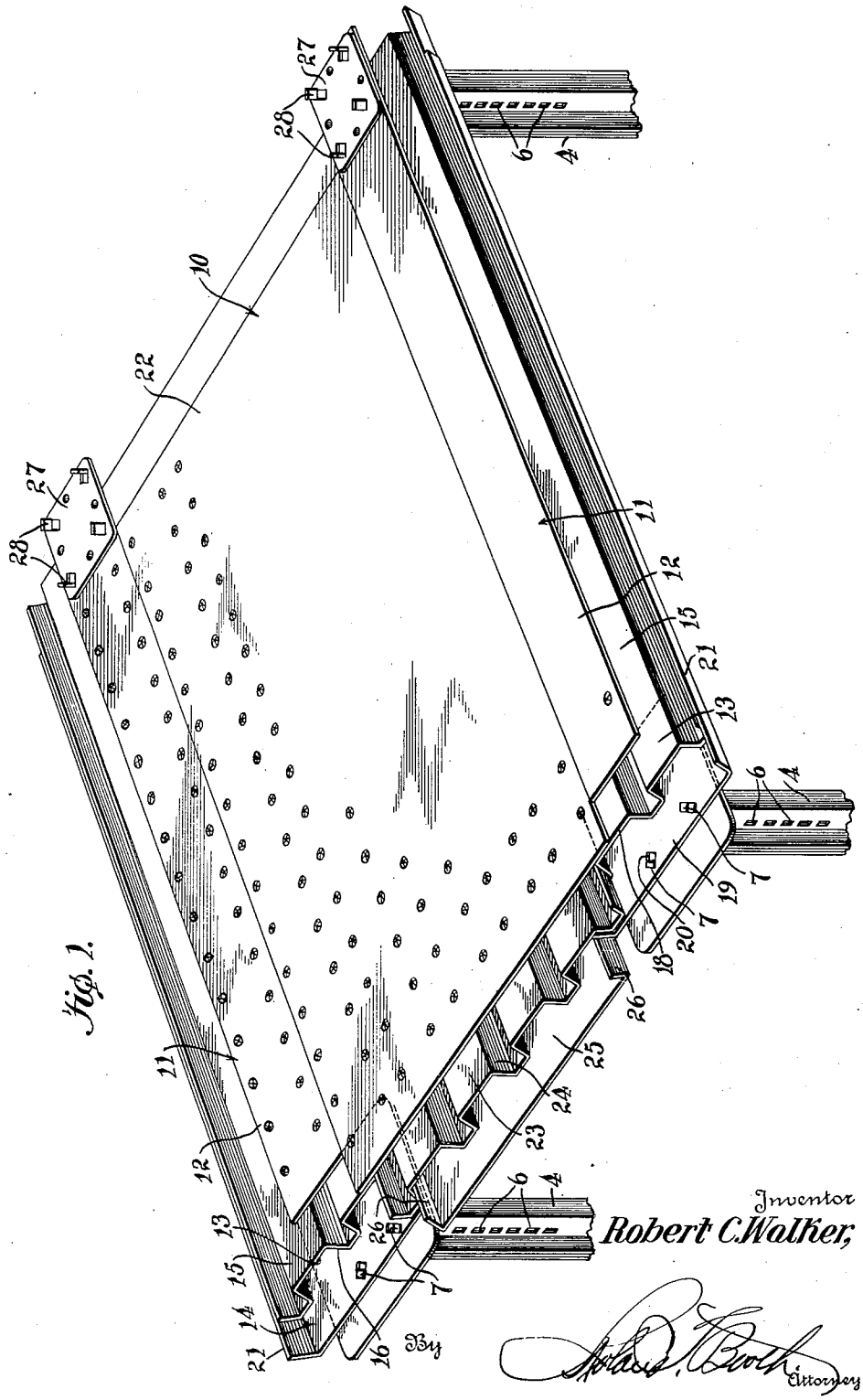


Fig. 1.

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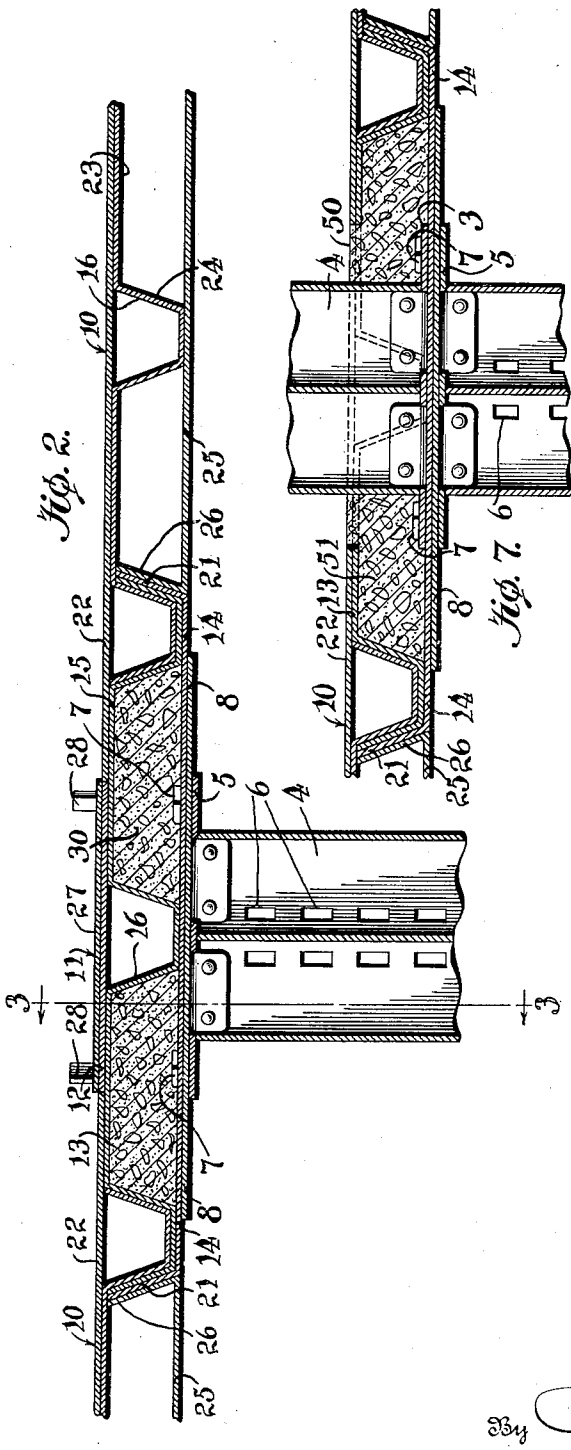


Fig. 2.

Fig. 7.

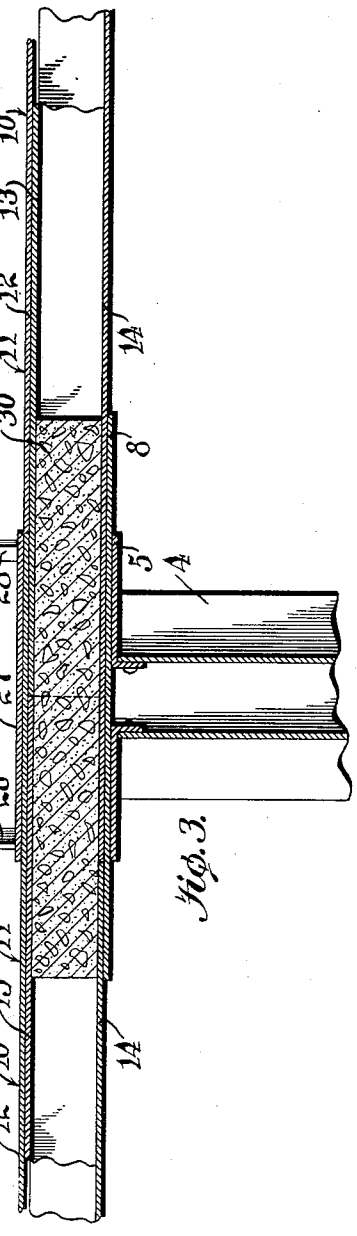


Fig. 3.

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BOOK STACK CONSTRUCTION

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Fig. 5.

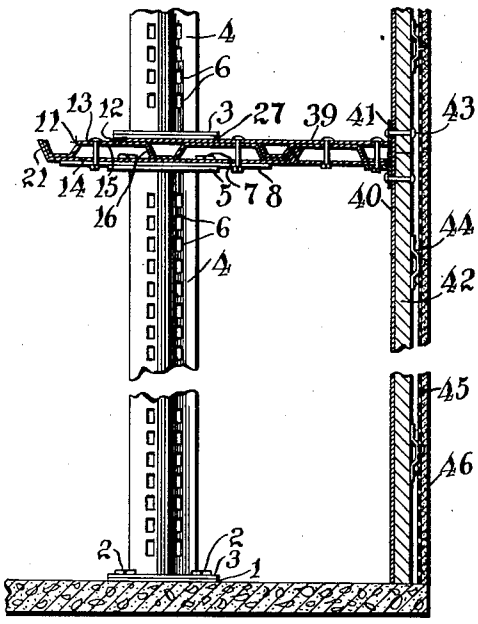


Fig. 6.

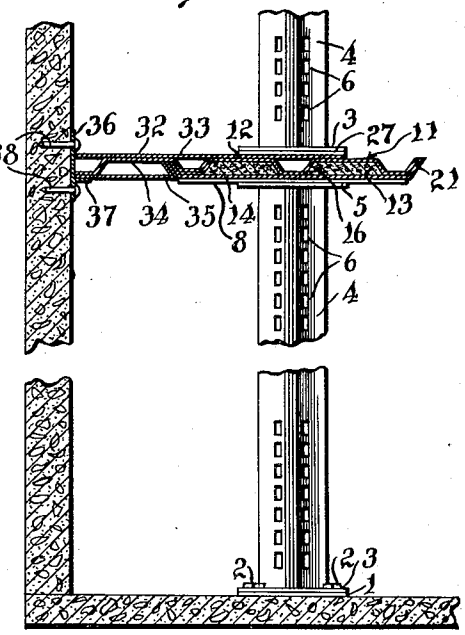
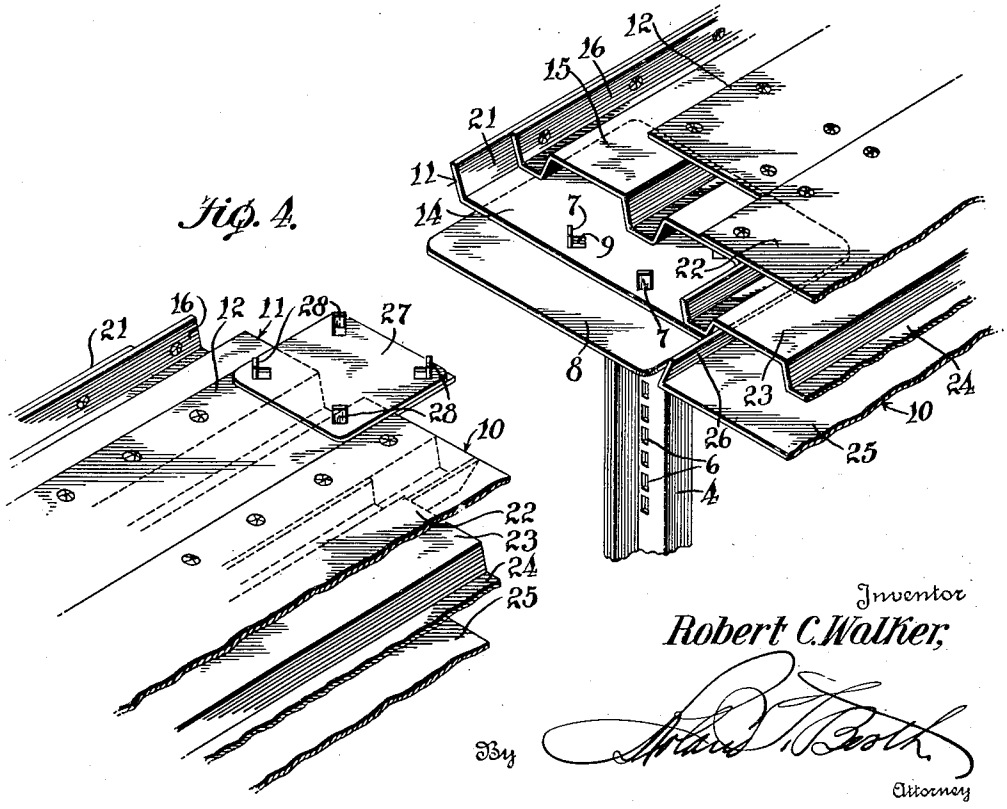


Fig. 4.



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UNITED STATES PATENT OFFICE

2,003,671

BOOK STACK CONSTRUCTION

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Application April 5, 1933, Serial No. 664,576

11 Claims. (Cl. 72—1)

This invention relates to improvements in a book stack construction.

This book stack invention provides a plurality of stack column members of substantially uniform size and dimension for the erection of a book stack in a progressive manner beginning at the foundation and erecting one floor at a time on the upper ends of each set of column members which have a length substantially equal to the distance between floors with a floor structure of unit type. The floor structure has a plurality of sheet metal sections formed for stress distributing cooperation for the purpose of providing a rigid floor structure connecting the columns in the book stack in such a manner that the columns will be held in rigid assembled relation. The sheet metal floor structure cooperates with the columns to carry and distribute the load applied thereto. The invention further provides a floor structure having the sections in substantially unit form, and of such a character, that they can be made in standard sizes and set up at any desired point with uniformly constructed column members formed for interengaging cooperation with the floor sections.

The invention provides floor structures having uniformly smooth ceiling surfaces between the rows of columns in all directions in order that head room in the stack aisles is not obstructed in any way. In obtaining this result the floor structure comprises spaced parallel plate members connected by intermediate angular sectional portions that are rigidly assembled with the spaced parallel plate members to provide the rigid floor structure having the necessary load carrying and distributing qualities.

This floor structure will also provide for the housing of electrical cables or other electrical circuit wires that it may be desired to have in the stack structure for lighting or other types of equipment.

The invention provides a floor structure having overlapping, interfitting and interlocking joint connections between floor sections so arranged that the joint between each section of sheet metal in the floor structure will occur at a different point in the floor and thereby distribute the joints between sections in a manner that will provide for the efficient assembly of the floor sections at the same time securing a maximum strength in the assembled structure.

The invention further provides for a special wall structure cooperating with the stack construction to provide either a permanent or temporary stack and building structure in which the walls for the building will be attached to and substantially carried and supported by the stack.

In the drawings:

Fig. 1 shows in perspective several floor sections in assembled relation on the upper ends of a plurality of stack column members, only a sufficient number of the floor sections and columns being illustrated to show clearly how a stack incorporating the present invention is constructed.

Fig. 2 is a vertical cross section through one of the column members and a floor section supported thereby showing the complete floor structure and the manner in which it is assembled with the stack column members.

Fig. 3 is a vertical cross section taken on line 3—3 of Fig. 2.

Fig. 4 illustrates in perspective, the structure of the sheet metal floor sections and particularly the manner of arranging the overlapping ends to secure two adjacent sections in assembled relation to provide a rigid floor structure, the floor sections being illustrated in disassembled and separated relation.

Fig. 5 is a vertical cross section through a stack column member and a floor section assembled therewith also showing the outer wall structure of this invention assembled with the stack, the wall structure being of a substantially temporary type.

Fig. 6 shows a vertical cross section of a stack column member and assembled floor structure with a slightly different type of wall structure to form the outer wall of the building for the stack.

Fig. 7 is a vertical section through a column and floor section showing a modified construction.

The book stack construction provided by this invention uses foundation plates 1 that may be made of sheet metal and are arranged in coplanar relation on the foundation of any building or building floor that is constructed to carry the load of the stack. The usual unevenness of the floors and foundations of a building presents a problem in the building of a book stack from uniform sized parts because of the difficulty in lining up the parts to support the book shelves and carry the load.

The use of the foundation plates 1, therefore, provides a means for constructing a book stack where uniform-sized parts can be employed. The foundation structure of the building is suitably modified where desired, by building up or cutting down, so that all of the foundation plates may

be arranged in their proper spaced relation in rows both longitudinally and transversely of the book stack structure or the building structure, and levelled so that they will be in the same plane, or as stated above, in coplanar relation. The positioning of the foundation plates 1 determines the positioning of all of the stack columns in the stack structure. These foundation plates are suitably anchored to the foundation of the building structure by lag screws or the like extending through holes in the plate. The corner portions of these foundation plates are provided with upwardly extending bendable tongues 2, see Figs. 5 and 6, that extend through openings in the base plate 3 on the lower ends of the stack column members 4. The construction of the foundation plates 1, and the stack column members 4 with the base plates 3 and top plates 5 on opposite ends, is fully described in co-pending application, bearing a serial number with which the number of this application is consecutive, and filed on even date herewith.

The column members 4 are provided with a plurality of slots 6 arranged in rows so that adjacent columns will receive the opposite ends of book shelving and the hook connections on the end members of the selves will detachably engage in these slots in order to support the shelves on the stack column members. The top plates 5 are provided with upwardly extending tongues 7 as shown in Figs. 2 and 5.

In the erection of a stack according to this invention, the foundation plates are first placed in position, then a set of stack column members 4 are mounted on the foundation plates and the tongues 2 turned downwardly in order to firmly secure the stack column members to the foundation plates. Then the structure is ready for the application of the first floor structure.

Before applying the floor structure, a bearing plate 8 is mounted on the upper end of each of the column members 4. The bearing plates 8, as shown in the drawings, are of rectangular form and are larger than top plates 5 on the column members. These bearing plates are provided with openings 9 positioned to receive upwardly extending tongues 7 on top plates 5 and in this way the bearing plates are interengaged with top plates 5, and held in position on the upper ends of column members 4. These bearing plates form a means of distributing and equalizing the load applied to column members 4 by the stack structure above.

After bearing plates 8 are applied to the column members, the first floor sections are then placed in position and assembled. Two different kinds of floor sections are used in the structure of the floor as shown in the drawings, and include the floor sections 10 and the strip sections generally indicated at 11, although the floor may be constructed with the use of other types of floor sections where they may all be of one standard size.

The strip sections 11 extend longitudinally or transversely of the stack in one direction only, and are interconnected at their ends. They are mounted on the upper ends of the column members in each row and serve to connect all of the columns in each row, while the floor sections 10 are interlocked with the edge portions of strip sections 11 to complete the floor structure.

Each strip section 11 includes a relatively narrow floor plate 12, an intermediate corrugated strip 13 and a ceiling plate 14. The plates 12, 13 and 14 are of substantially equal length, but they are offset longitudinally, in order that the ends will terminate in overlapping or stepped relation so as to provide an overlapping structure at one end of each strip section that is the complement of the overlapping section at the opposite end thereof. In this way the ends of two adjacent strip sections 11 will be adapted for complementary overlapping engagement with each other in a manner to be described. The floor plate 12 is in the form of a narrow elongated flat plate. The intermediate corrugated section 13 has a series of sections 15 arranged in coplanar relation and separated from each other by channel sections 16 which project to one side of the sections 15. These channel sections 16 are formed from the same sheet of material with sections 15 to provide the corrugated intermediate member 13. The sections 15 are suitably welded at intervals to the contacting portions of floor plates 12 by spot welding, plug welding or any other suitable form of connection that will provide a smooth floor surface on the top face of the floor plates.

As shown in Figs. 1 and 4 floor plates 12 have the ends 17 offset from the ends 18 of corrugated sections 13, to provide an exposed portion of sections 15 beyond the end 17 of each floor plate 12. This occurs at one end of the strip sections 11 while at the opposite end a corresponding portion of floor plate 12 overhangs the end of intermediate section 13 to such an extent that it will overlie the intermediate section 13 of another strip section 11 so as to abut the end 17 of floor plate 12 on such other strip section. The ceiling plate 14 projects beyond the end 18 of intermediate section 13, as indicated at 19 in Fig. 1, and the opposite end terminates short of the opposite end of the intermediate section a distance equal to the distance between the ends 18 and 19. In this way the ends of the strip sections are complementary to each other.

When two of these strip sections are assembled together the ends are registered in abutting relation, that is, the ends of the respective sections 12, 13 and 14 abut in end to end relation and as a result portions of the sections 12, 13 and 14, on two adjacent sections overlap each other. The overlapping portions are spot welded, plug welded or otherwise secured together to form a unitary structure.

The ends of each strip section terminate over one of the bearing plates 8 in the manner illustrated in Figs. 1, 3 and 4, and each ceiling plate 14 is provided with openings 20 positioned to receive tongues 7 on top plates 5. This provides an interengagement between the strip sections and the column members, so that in the assembled relation of the strip sections on the column members, the ends of the column members are uniformly spaced apart and interlocked with the strip sections to provide a rigid stack structure in assembled relation. The ends of tongues 7 may be bent down on top of the ceiling plate to further interlock the column members with the strip sections.

Each strip section has the intermediate corrugated section 13 formed so that the side edges terminate in channel portions 16. The ceiling plate 14 is formed along the side edges to provide upwardly extending angular flanges 21 on opposite sides engaging and secured to the outside of channel members 16. The floor plates 12 are of less width than the sections 13 and 14 as illustrated in the drawings, having the side edges terminating intermediate channel portions 16 and over portions 15 of the intermediate section.

Floor sections 10 are constructed to have substantially the same length as strip sections 11 and to extend between and interlock with the strip sections connecting column members in adjacent rows in the manner illustrated in Fig. 1. Each floor section comprises a floor plate 22 having the side edges abutting the side edges of floor plates 12 and overlying portions 15 of the intermediate section 13 of strip member 11 to which they are suitably secured by plug welding or in any other suitable manner.

Each floor section 10 includes an intermediate corrugated section 23 having a plurality of channel portions 24 formed at spaced intervals therein. The sections 23 are formed from a single piece of sheet material as illustrated and the channel portions 24 are of similar size and dimension to channel portions 16. The side edges of the intermediate section 23 terminate in channel portions 24 that are formed of a size to interfit in channel portions 16 at the side edges of strip sections 11 in the manner illustrated in Figs. 1 and 2 to provide an interlocking joint between floor sections 10 and strip sections 11.

Each floor section 10 is provided with a ceiling plate 25 having inwardly extending angular flanges 26 at the side edges arranged in spaced parallel relation to the channel portions 24 at the side edges of intermediate section 23 so as to provide a groove for receiving the flange 21 on the ceiling plate and the connected portion of channel 16 of intermediate section 13. This provides an interlocking connection between the side edges of the floor sections and adjacent strip sections 11.

The ends of the floor section 10 are offset to provide complementary portions at opposite ends of each floor section. At one end of each floor section 10 the intermediate section 23 terminates beyond the end of floor plate 22 as shown in Fig. 1 and ceiling plate 25 has one end terminating beyond the end of intermediate section 23.

When floor sections 10 are assembled with strip sections 11, the end of each floor plate 22 is arranged to terminate in coincident relation with the ends of corrugated intermediate section 13 of strip sections 11 as shown in Fig. 1. The end of intermediate section 23 terminates coincident to the end of ceiling plate 14 of strip sections 11 while ceiling plate 25 has the end terminating in offset relation thereto.

Floor plate 22, intermediate section 23, and ceiling plate 25 are all rigidly welded together at a plurality of points throughout their width and length to provide a rigid floor construction, the plates 22 and 25 cooperating with intermediate section 23 formed with channel portions 24 so that the plates 22 and 25 are spaced apart while intermediate section 23 has stress distributing cooperation therewith. Floor plates 22 are welded at a plurality of points along the side edges to strip sections 11 and the overlapping complementary portions of each floor section 10 in interengaged relation are welded together to form a continuous rigid floor structure in which the ends of each floor plate 22 of each section abut the ends of floor plate 22 of each adjacent section and the ends of the corrugated intermediate sections 23 and ceiling plates 25 likewise abut in end to end relation with the corresponding portions of adjacent floor sections.

After a set of stack columns are erected on the foundation plates, a series of floor sections and strip sections 10 and 11 respectively are assembled together in the manner described above on the tops of the bearing plates to provide a complete floor on the upper ends of the first set of column members. After this structure is completely assembled, the next set of columns is then erected to support the second floor in the book stack. In order to provide for the proper positioning of the second set of stack column members on the assembled floor structure, each floor plate 12 has a positioning plate 27 secured on one end in the manner shown in Figs. 1 and 4 by welding or in any other suitable manner. These plates 27 are located on floor plates 12 in a position so that they will overlie the top plates 5 on the column members below in coincident spaced parallel relation. These positioning plates are constructed in a manner similar to foundation plates 1. The plates 27 are provided adjacent the corner portions with upwardly extending tongues 28 for interengagement in the holes in the bottom plates 5 on column members 4 that are erected on top of the assembled floor structure to support the next floor above. When these column members are in position in the manner shown in Figs. 5 and 6, they will be properly centered in end to end relation over the first set of column members so that the slots 6 will be spaced apart the proper distance to receive standard length shelving. The tongues 28 may be bent downwardly on top of the bottom plate of the column members seated thereon so as to hold the column members in rigid assembled relation therewith.

In the assembly of the floor sections 10 and 11 on the upper ends of column members 4, provision may be made for load transmission through the floor between the ends of upper column members and column members below the floor, by filling the spaces between adjacent corrugations of the intermediate corrugated sections 13 where they overlie bearing plates 8 with concrete or similar material as indicated at 30 in Figs. 2 and 3. In this way the transmission of the load from one set of column members to a set below, is obtained without applying unnecessary loads or stresses on the floor structure.

The succeeding floors above the first floor are arranged on the upper ends of the column members in the same manner as above described, one floor being constructed after another in progressive relation upwardly until the entire stack structure is completed. All of the parts are welded together, in the manner described, to provide a rigid stack construction having the floor and strip sections 10 and 11 cooperating to provide a rigid integral floor structure providing means for holding column members 4 in assembled relation to form the book stack, and carry and distribute the load. This structure will also provide unobstructed head room along the ceiling surfaces of the aisles of the stack after the shelves are put in place by interlocking them in slots 6 in the column members.

Where the stack is erected in a building, it is to be understood that the foundation plates 1 will be placed in position and the stack erected in the manner described, independent of the building wall and so that the main stack structure including the series of columns and floor sections assembled together will be substantially independent of the building and will fill the entire space provided for the structure. Fig. 6 illustrates a construction of this character having the building wall 31 shown in spaced relation to the outer row of column members 4. Due to variations in the structure of the building wall

from the structure of the stack that occur in such constructions, the stack construction will be built so that wall engaging floor sections 32 will be constructed to have the proper dimension to fill the space between the outer edges of assembled strip sections 11 and floor sections 10 of the floor structure and the wall. The wall engaging floor sections 32 will have floor plates 33, intermediate corrugated sections 34, and ceiling plates 35. These parts, 33, 34 and 35, will be formed at the side engaging with the strip sections 11 to interlock with the interlocking edge portions thereof in the same manner that floor sections 10 interlock therewith, along the side edges. Where wall engaging floor sections 32 are at the ends of floor sections 10 or strip sections 11, the ends will terminate in offset overlapping relation to form complementary parts to the ends of floor and strip sections 10 and 11, in a manner that will be clearly understood from the above description of these parts. In other words, the portions of all of the wall engaging floor sections 32 that surround the main stack structure in a building will have complementary portions to interlock with adjacent floor and strip sections to provide a complete floor structure in the building.

The outer edges of wall engaging sections 32 carry a wall engaging plate 36 having a lateral flange 37 suitably secured to the outer edge of the section under ceiling plate 35. Suitable anchor members 38 are extended through openings in the wall engaging plate 36 and embedded in wall 31 to firmly attach and anchor the floors of the book stack structure to the walls of the building. These wall engaging sections 32 are constructed to correspond with the floor and strip sections 10 and 11 at adjacent edges so that a plurality of wall sections 32 have their adjacent edges provided with complementary interengageable portions the same as floor sections 10 and 11. It is not believed necessary to describe these in view of the above description showing how adjacent strip sections 11 and floor sections 10 are interengaged with each other and with adjacent strip and floor sections at the ends and side edges.

The spaces between channels 24 of floor sections 10 may be used for electrical conduits or other wiring for the book stack that may be necessary, the ceiling plates 25 being drilled to seat the connection boxes for the electric circuit at desired intervals.

The book stack structure may be built according to this invention so that the stack structure provides a combined building structure attached to and constructed in conjunction therewith. Such a type of construction is illustrated in Fig. 5 having wall engaging and supporting floor sections 39 constructed and assembled in the same manner as wall engaging sections 32.

To construct the walls of a building with this type of construction, sheet metal plates 40 are erected around the outside of the stack to form inner walls for the stack building, these sheet metal plates being bolted or otherwise suitably attached to wall engaging portions 41 of floor sections 39. Outside of the inner wall plates 40 is arranged a series of insulating slabs 42. Suitable forms of well known composition board may be used for this purpose, and are known to provide efficient insulation for building structures. These are bolted to the wall engaging plates 41 with the same bolts that secure inner wall plates 40 thereto as clearly shown in Fig. 5 and indicated at 43. A series of brackets 44 are mounted on the outside of the insulating slabs 42 and may be bolted thereto and to the inner wall members 40 so as to provide a rigid mounting for the brackets 44. Expanded metal diagrammatically indicated at 45 in Fig. 5 is then attached to these brackets 44 and a suitable coating of cement, pebble dash, or other type of outside finishing material indicated at 46 is then applied to the expanded metal or other mesh structure so as to form an outside wall structure for the stack building. Of course, windows may be inserted in this structure to provide for the admission of light and air to the stack structure at desired points, and the manner of constructing and mounting the windows in the wall can be done according to any well known method.

This type of construction as shown in Fig. 5 provides a stack building wherein the stack structure is rigidly assembled together and supports both the walls and roof of the building. The roof is applied to floor sections mounted on the upper ends of the uppermost column members by putting suitable roofing material over the floor sections. The loads on this structure are carried by the stack structure including the column members, the column members cooperating with the floor structure to support the walls for the building. The wall structure also cooperates with the stack structure in carrying and distributing loads to a considerable extent and provides a building structure that can be dismantled whenever removal of the stack is desired. This construction therefore, provides what may be termed a temporary form of stack structure that has the strength and cooperation between the different parts that is necessary to carry all the load applied on the book stack and may be used for a permanent building structure as long as desired, that is economical to construct.

In some cases it may be desirable to seat the base plate of an upper column member in substantial adjacent and interlocked relation with the top plate of the column member below. This may be done as shown in Fig. 7 by cutting an opening 50 in the floor plate 12 and intermediate section 13 in each strip section at the point where the positioning plate 27 is located and slightly larger than this plate in order to provide for the entry of the base plate 3 on a column member having the same size and shape as positioning plate 27.

With the structure shown in Fig. 7, the base plate 3 of the column member will extend through openings 50 and seat on the upper face of ceiling plate 14 in aligned relation over the column member below and with the openings in the base plate receiving tongues 7 on the top plate of the column member below for accurately positioning the column member in aligned relation. These tongues may be bent over to firmly itnerlock one column member with another and in order to provide a further means of holding the column members in assembled relation, interlocking with each other and with the floor structure, the openings through the hole 50 may be filled with concrete as indicated at 51, if desired. The structure shown in Fig. 7 still obtains full cooperation of the floor members with the column members in assembled relation to form a substantially rigid stack structure that will equalize and distribute the loads supplied thereto between the floor structure and the column members and thereby provide a stack structure that can be made of relatively light weight sheet material formed in such a manner that it will carry substantial loads.

The invention claimed is:

1. A library stack, comprising a plurality of vertically spaced floors, each floor having a plurality of metal floor sections formed on the marginal portions for interfitting interlocking cooperation with adjacent marginal portions of adjacent floor sections, a plurality of stack column members extending between and supporting said floors and arranged in rows longitudinally and transversely, said stack column members being in vertically aligned relation, load carrying means on the floors extending between the ends of aligned column members on opposite sides thereof, and foundation plates mounted in horizontal coplanar and predetermined spaced relation, said plates receiving and supporting the lower ends of the lowermost column members and providing a base for supporting the library stack and predetermining stack column position.

2. A library stack, comprising a plurality of vertically spaced floors, each floor having a plurality of floor forming sections formed to overlap and interlock at the marginal portions with similar sections to provide a floor having smooth continuous floor and ceiling surfaces, a plurality of stack column members extending between adjacent floors and arranged in rows in spaced relation longitudinally and transversely out of alignment with the joints between floor sections, and means detachably interlocking the ends of said stack column members with said floors, the column members between different floors being in aligned relation.

3. A library stack, comprising a plurality of floors spaced uniformly apart, a plurality of stack column members of uniform size extending between adjacent floors and supporting said floors, said column members being arranged in rows longitudinally and transversely of the stack, column members between different floors being in aligned relation, each floor having a series of column connecting strip sections and floor sections, said column connecting strip sections connecting the column members of each row in one direction together, said sections each being formed with cooperating parts for interlocking the strips together in each row, said floor sections extending between rows of columns and the connecting strip portions and having cooperating parts on all of said sections for interlocking the floor sections together, and interlocking the floor sections to the strip sections, whereby the assembled floor and strip sections cooperate to provide rigid floors for said stack, secure said column members thereto in assembled relation and provide a complete substantially rigid book stack.

4. A library stack, comprising a plurality of floors spaced uniformly apart, a plurality of stack column members extending between said floors and arranged in rows longitudinally and transversely, the column members between different floors being in aligned relation, said floors including a floor structure having a plurality of connecting strip sections, and a plurality of floor sections, said strip sections being in interengaged and interlocked relation in rows and connecting said column members together in rows in one direction, and said floor sections having interengaged interlocked connection in rows arranged alternately with rows of strip sections, said rows of floor sections having interengaged and interlocked connection at the side edges with said connecting strip sections, said floor and strip sections having stress distributing cooperation with each other and said stack column members to provide a substantially rigid book stack structure.

5. A library stack comprising a plurality of floors, a plurality of stack column members extending between and supporting said floors, said column members being in spaced relation in rows longitudinally and transversely of said stack, column members between different floors being in aligned relation, said floors comprising a floor structure having a plurality of floor sections, each floor section having spaced floor and ceiling plate members and a plurality of connecting members extending between and rigidly connecting said floor and ceiling plate members having stress distributing cooperation therewith to provide substantially rigid floor sections, each floor section having cooperating parts for interconnection with corresponding parts of adjacent floor sections to provide a substantially rigid floor structure with the respective floor and ceiling plate members of each section in coplanar relation.

6. A library stack, comprising a plurality of floors, a plurality of stack column members extending between and supporting said floors, said floors comprising a plurality of floor sections, each section having spaced parallel floor and ceiling plate members, and a plurality of connecting sections extending transversely between and rigidly connecting said floor and ceiling plate members for stress distributing cooperation, each floor plate member having opposite ends offset relative to the ceiling plate member and connecting sections to provide overlapping interconnecting end portions between adjacent floor sections in assembled relation, said floor and ceiling plate members and said connecting sections being formed at opposite sides of each floor section to engage in complementary portions of adjacent floor sections for interlocking cooperation, whereby a substantially rigid floor structure is provided by a series of connected floor sections.

7. A library stack, comprising a plurality of floors, a plurality of stack column members extending between and supporting said floors, said floors comprising a plurality of floor sections, each section having spaced parallel floor and ceiling plate members and a plurality of laterally extending connecting members between and rigidly connecting said floor and ceiling plate members having stress distributig cooperation therewith to provide substantially rigid floor sections, each floor section having cooperating parts for interconnection with corresponding parts of adjacent floor sections to provide a substantially rigid floor structure with the respective floor and ceiling plate members of each section in coplanar relation, and cooperating parts on said floor section and said stack column members for detachably connecting said stack column members to said floor structure for stress distributing cooperation therewith to provide a rigid stack structure.

8. A library stack, comprising a plurality of floors, each composed of a plurality of floor and ceiling plate members mounted in spaced parallel relation, stress distributing members extending between said floor and ceiling plate members and rigidly connecting said members in assembled relation, a plurality of stack column members extending between the floor plate members of one floor and the ceiling plate members of an adjacent floor next above, said stack column

members having parts on the ends thereof interengaging with corresponding parts on said ceiling and floor plate members, respectively, for detachably interlocking said floors with said column members to provide a substantially rigid assembled stack structure.

9. A reinforced sheet metal floor structure for library stacks, comprising spaced parallel floor and ceiling plate members transversely extending connecting members between said floor and ceiling plate members rigidly connecting said members in assembled relation and having stress distributing cooperation therewith, each plate member having complementary parts formed on the marginal portions thereof for interlocking cooperation with the cooperating marginal portions of adjacent similar plate members for interlocking a series of floor sections together in assembled floor forming relation with the floor and ceiling plate members of each section arranged in coplanar relation respectively.

10. A library stack, comprising a plurality of floors spaced uniformly apart, each floor having a plurality of sections in coplanar relation, the marginal portions of each section being formed to overlap and interfit in interlocked complementary relation with the margins of other sections, a plurality of stack column members extending between floors arranged in uniform spaced relation in longitudinally and transversely extending rows, each column member having plates engaging the floor in the zone of said marginal portions and engaging a plurality of floor sections, and parts on said floor sections and plates for interlocking said floor sections with said column members.

11. A reinforced sheet metal floor structure for library stacks, comprising a series of strip sections and floor sections, said strip sections being arranged in rows in one direction, each row being spaced apart a distance equal to the width of a floor section, said floor sections being arranged in rows between said rows of strip sections, said strip sections having cooperating complementary parts on the ends thereof for interengaging interlocking connection with adjacent strip sections, said floor sections having interlocking parts on the ends for connecting each section to adjacent floor sections, and said strip and floor sections having complementary interlocking parts for securing the side portions of said strip sections to the side portions of adjacent floor sections to cooperate in forming a floor structure having substantially smooth floor and ceiling surfaces.

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