This invention is designed as an improvement on Patent No. 1,477,813, dated December 18, 1923, relating to floor and wall construction and more particularly to what is commonly known as parquet flooring and mosaic wall paneling. The primary object is to provide boarding material or flooring panels constructed in composite sections having integral and associated means for securing or joining a group or multiplicity of such sections together in properly assembled cross-grain relation by inter-locking tongue-and-groove connections, to form a floor or sealed wall without necessity for other fastening means than said inter-locking connections.

A further object is to provide substantially rigid or semi-rigid sections of finished material of the character referred to, from which attractive and durable parquet floors, panelled walls, ceilings and the like, may be inexpensively and efficiently constructed at nominal expense in costs or production and labor in assembly.

The invention will first be hereinafter more particularly described with reference to the accompanying drawings, which are to be taken as a part of this specification and then pointed out in the claims at the end of the description.

In said drawings, Fig. 1 is a perspective view of a portion of a floor embodying my invention, illustrating the manner in which its several pieces are composite and united in a semi-rigid section;

Fig. 2 is a perspective view of a panel embodying one form of the invention illustrating the manner in which its several pieces are composite and united in a semi-rigid section;

Fig. 3 is a sectional elevation of a portion of the floor, taken on the line 3—3 of Fig. 1, the composite sections being shown disconnected;

Fig. 4 is a perspective view of a floor, similar to Fig. 1, as constructed from composite sections of a slightly modified form, producing identically the same superficial appearance as the floor shown in said first named figure;

Fig. 5 is a perspective view of a panel of the modified form, illustrating the manner in which its several pieces are similarly united in a semi-rigid section having a transverse groove in one end, the complementary removal shank or spline being shown detached therefrom;

Fig. 6 is a sectional elevation of a portion of the floor (similar to Fig. 3), taken on the line 6—6 of Fig. 4;

Fig. 7 is a perspective view of a section or panel of the preferred form, illustrating the novel means by which its component pieces or parts are compositely united in a substantially rigid section;

Fig. 8 is a sectional elevation showing a portion of a floor (similar to Figs. 3 and 6) as constructed from sections of the preferred form, the several composite sections being arranged in proper relation for assembly; and

Fig. 9 is an enlarged perspective view of the retaining and reinforcing corrugated metallic strip or spline by which the component pieces or panels of each section are compositely united and held together at both ends.

Referring to the drawings in which like reference numerals are used to indicate corresponding parts throughout the several views, 9 denotes the border strips or members which are preferably secured against the walls of a building subjacent the ordinary floor board, said strips or members being kerfed or grooved longitudinally along one edge and arranged with their grooved edges toward the center of the room, corresponding pieces or sections thereof being mortised or otherwise joined together at corners, so as to extend completely and continuously around all sides of a room, or to border the area covering which a multiplicity of composite sections or panels embodying this invention, are laid edge to edge in proper cross-grain relation to each other in order to form a completed parquet floor, wall or ceiling. If desired, a number of these strips or members 9, which for such purpose are kerfed or grooved along opposing edges, may be laid at spaced intervals across the area to be covered, the flooring sections being interveningly connected therewith in proper cross-grained relation to each other, in order to produce a "checker-board" effect.

Composite floor sections or panels are secured in interlocking engagement with said border-strips and with each other, by means of integral extending tongues or tenons, and by loose or removable connecting shanks or
splines 10, (interchangeably engageable between and within opposing grooved edges in the border-strips and in the ends or sides of similarly formed composite sections, according to which confronts the other, as shown in Figs. 1 to 4. A multiplicity of these removable splines are advantageously and economically employed throughout the assembly, for interlockingly connecting the sections to each other, as above stated, especially with sections of the form shown in Fig. 5, said splines being readily and quickly fitted between opposing grooved edges in the sides and ends, respectively, of immediately adjacent sections, at points where opposing grooved edges are necessarily brought together, as clearly illustrated in Fig. 6.

The individual composite sections or panels of flooring or wall material, may be constructed in accordance with this invention in several different forms, of which three are here shown, there being, however, no essential difference between them, each being adapted to produce a floor of identically the same superficial appearance. These sections, as shown more clearly in Figs. 2, 5 and 7, are formed of multiple pieces of odd planking, boards or scrap material of equal lengths, which are united or secured together longitudinally in a composite structure, with their edges and surfaces flush and the grain of the wood in the respective pieces running in substantially the same direction, by means of transverse corrugated metallic strips or splines 11 extending across substantially the full width of the sections, said strips being pressed firmly into the wood in the direction of the grain along and flush with corresponding edges of the pieces at both ends of said sections, while the latter are held rigidly under lateral compression.

The composite sections 12 illustrated in Figs. 1 to 3 inclusive, are formed with tenons 12 providing integral projecting tongues on opposite ends thereof, the several pieces comprising said sections being semi-rigidly united and inseparably secured together by means of a single corrugated metallic strip or spline 11 inserted under pressure along the edge of the tenon on each end, the edges along opposing sides of the sections being continuously kerfed or grooved to a standard depth equal substantially to the width of the tenons on their ends, into which the removable and interchangeable splines 10 or the extended tongues of similarly formed sections are adapted to fit in interlocking engagement therewith. These sections or panels may be formed in any desired size or shape, (square, oblong or diamond) and any suitable material may be utilized as the component parts thereof, the several pieces of each section being joined together in the manner hereinbefore described.

The composite sections 13 shown in Figs. 4 to 6 inclusive, are each formed with a tenon 13 providing an integral projecting tongue on one end and with a groove 13 in its opposite end, the several pieces comprising said sections being semi-rigidly united and inseparably secured together by means of single corrugated metallic strips or splines 11, inserted under pressure respectively along the edge of the tenon on the one end, and in the countersunk edge of the groove 13 at the opposite end thereof, a wooden spline 10 being employed to provide a removable extending tongue in said grooved end of the section as hereinbefore stated, a multiplicity of removable splines 10 being employed during the assembly of a plurality of said sections, at points where opposingly grooved side or end edges of sections and border strip respectively, are to be inter-lockingly connected together, the edges along opposing sides of the sections being similarly grooved to a standard depth substantially equal to the width of the tenon on their ends, as described with reference to the sections 12.

The composite sections 14 of preferred form, as illustrated in Figs. 7 and 8, are formed with tenons 14 providing integral projecting tongues on opposite ends thereof, similarly to the sections 12, the several pieces comprising said sections being united or inseparably secured together by means of transverse corrugated metallic strips 11 inserted under pressure along the respective tenoned edges of the sections above and below the tenons on opposed ends thereof as shown, thus doubly reinforcing the panels and holding the component pieces together in a substantially rigid section, the edges along opposing sides of the sections being kerfed or grooved to a standard depth equal substantially to the width of the tenons thereon, as described with reference to the sections 12 and 13, a group or multiplicity of sections of the preferred form being assembled or inter-lockingly connected together in the manner hereinbefore explained.

Referring now to Figs. 1, 3, 4, 6 and 8, it will be observed that a multiplicity of similar sections of either form, may be readily and quickly assembled by inter-engaging or inter-locking tongue-and-groove connections with each other in the manner described to produce a solid and durable floor structure, the border strips or members 9 being preferably employed in order to facilitate the assembly and effect a neat and attractive appearance to the completed floor. The composite sections or panels are secured in inter-locking engagement with said border strip and with each other, by means of their respective tenons 12, 13 and 14 and by the removable splines 10, which are snugly fitted within or inserted between the opposing
grooved edges in the border strip and end or side of similarly formed sections. It may be noted that the grooved end edges of the sections 13 in which the splines 11 are counter sunk, may be readily connected or secured to the border strip 9 at substantially right angles thereto, by means of removable splines 10 fitted loosely between the grooved edges thus brought in opposition, and that similar sections may then be laid end to end successively across the area to be covered, with their grooved ends respectively opposed to grooved ends or sides, or to the tenoned ends of adjacent sections. Similarly, the ends of sections 12 and 14, in which the tenons are formed on opposite ends, may be engaged or secured to the border strip with the tenon inserted in the grooved edge thereof, similar sections being then laid end to end successively across the area to be covered, with their respective tenoned ends in opposition to the grooved edges in end or side of adjacent sections.

The composite sections are thus assembled in connection with the border strip and with each other, each section being laid or arranged with the grain of the wood therein running at substantially right angles to the grain of the wood in its adjacent sections, the tenon or tenons on each section being engaged in grooved edges along end or side of adjacent sections, a multiplicity of associated removable splines 10 being utilized throughout the assembly for interlocking joining sections together where their opposed grooved edges are brought in meeting contact, thus providing a solid parquet floor, in which few, if any, nails are required to hold the individual sections in place. It will be appreciated that any tendency of the wood to warp in the sections thus formed, will be restrained or prevented by the interlocking tenons and removable splines which are effectually clamped in a "vise-like" manner, within or between the grooved edges in adjacent sections, thus rigidly and solidly holding all the assembled sections together in cooperative relation, so that the floor will not buckle nor shrink with intervening spaces between sections, causing unevenness or gaps in the floor.

It will be noted further that these sections may be utilized to construct a wall or ceiling, the tenoned ends of the sections being engageable within longitudinal grooves in the studding or joists in a manner similar to that described in the patent hereinbefore mentioned, removable splines 10 being employed in the grooved edges in side or end of the sections where such grooved edges are brought in meeting contact or opposition to grooves in the joists or studs, the sections being assembled end to end or side to side with the grain of the wood in each section running substantially parallel or at right angles to the grain of the wood in its adjacent sections, whichever may be preferred, the several sections being thus slidably fitted between longitudinally grooved pairs of joists or studs and allowed to rest in position one upon the other, the removable splines 10 being inserted between opposed grooves of the respective sections and between said sections and said joists or studs, thus holding the sections firmly in position to provide a sealed wall or ceiling, which may be expediently and economically assembled or torn down. It may here be noted that the wall or ceiling sections may be assembled with the grain in the sections running substantially parallel with each other and at right angles to the joists, or substantially parallel with the joists and each other, or alternately with the grain in successive sections running at substantially right angles to each other and to the joists or studs as well.

I desire it to be understood that the word "flooring" as used in the appended claims, is intended to include not only flooring material, but wall panels, partitions, panelled ceilings and various other structures in which my invention might be used.

Furthermore, in the broader aspects of the invention for some purposes, other material than wood might be used to form similarly tongued and grooved sections or panels adapted to perform the same functions as sections formed of wood, and I therefore do not wish to limit my invention to parquetry floors or wall panels made entirely of wood, although the latter material is preferable.

A neatly finished, attractive and durable floor may be economically constructed with flooring sections of the form hereinbefore described, in which heretofore unusable waste products of lumber, such as short pieces of flooring material which are usually cast off and used for fire-wood, may be economically utilized. The invention is particularly valuable in that hard but inexpensive wood which is unfit for use as ordinary hard-wood flooring because of its tendency to split (for such reason having a very low market value as compared with ordinary flooring material), may be used in the sections without danger of the latter coming apart or loosening from place upon splitting of the wood at any point.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A parquet flooring comprising individually formed composite sections of flooring material inter-connected and held together in assembled relation by interlocking longitudinal and transverse groove connections between the sections with the grain of the wood in each section running at an angle to the grain of the wood in
its adjacent sections, the longitudinal grooves of the respective sections extending along their opposite edges at substantially right angles to the tongues on the ends thereof; the individual sections being composed of short pieces of boards longitudinally compressed and secured together with longitudinal edge to edge while held under lateral compression, by transverse corrugated metallic splines pressed firmly into the wood along corresponding edges in opposite ends of the respective pieces and extending substantially the full width of the sections, the edges of the tongues of the respective pieces terminating substantially flush with the countersunk edges of the longitudinal grooves in the sides thereof.

2. A flooring section comprising a plurality of wooden pieces of equal lengths arranged with longitudinal edge to edge and secured together in a composite structure with their edges and surfaces flush and the grain of the wood in the respective pieces running in substantially the same direction, said pieces being correspondingly tenoned at opposite ends to provide protruding transverse tongues on both ends of the sections and its outer pieces being kerfed longitudinally along their outer edges to provide longitudinal grooves in opposite sides of the section, the component pieces of the section being held together by unitary transverse corrugated metallic strips extending substantially the full width of the sections on opposite ends thereof adapted to hold said pieces compositely together in a substantially rigid structure, said strips being pressed into the wood in the direction of the grain along corresponding edges at opposite ends of the section, while the latter is held with its pieces under lateral compression, the tenoned ends of the section being adapted interchangeably to fit edge to edge in the grooved sides of similarly formed sections for interlocking tongue-and-groove connection therewith.

In testimony whereof I affix my signature.

ERNEST STUART DANIELS.