[0004] While elongated ceiling grid members for ceiling grid assemblies have been developed that have the capability that other structural members and room or building accessories can be attached to the elongated ceiling grid members at various locations along the elongated ceiling grid members, there is a need for elongated ceiling grid members to which different sized members can be readily and easily attached and for a ceiling grid assembly that includes such members.

[0005] In addition, there is also a need for improved elongated ceiling grid members and ceiling grid assemblies, including with regard to ease of installation, improved stability and strength and/or an improved architectural or aesthetic finish when viewed from underneath the ceiling grid assemblies.

[0006] This invention addresses those needs, as well as other needs that are readily apparent to those of skill in the art.

SUMMARY OF THE INVENTION

[0007] According to a first aspect of the present invention, there is provided an elongated ceiling grid members having a longitudinal axis and include an upper portion that extends along the longitudinal axis of the elongated ceiling grid member and is configured to receive and threadedly engage one or more fasteners along the longitudinal axis to connect at least two of the elongated ceiling grid members to each other, a lower portion that also extends along the longitudinal axis of the elongated ceiling member and is configured to receive and threadedly engage fasteners of different diameters all along the longitudinal axis, and a middle portion that connects the upper and lower portions.

[0007a] According to a second aspect of the present invention, there is provided a ceiling grid assembly comprising:

a plurality of elongated ceiling grid members having ends, the ends being connected to form a grid of the plurality of elongated ceiling grid members, the elongated ceiling grid members having a longitudinal axis and comprising:

an upper portion that includes a first pair of spaced and substantially parallel sidewalls that extend parallel to the longitudinal axis, the first pair of sidewalls having ridged interior surfaces that face each other;

a lower portion that includes a second pair of spaced and substantially parallel sidewalls that extend parallel to the longitudinal axis; and

a middle portion that connects the upper portion and the lower portion and is configured such that (1) an upper surface of the middle portion and the first pair of sidewalls define a top orifice and (2) a lower surface of the middle portion and the second pair of sidewalls define a bottom orifice; and

a plurality of connectors for connecting the plurality of elongated ceiling grid members to form the grid of the plurality of elongated ceiling grid members; wherein:

each sidewall of the second pair of sidewalls includes upper and lower ridged interior surfaces;

the upper ridged interior surfaces are first parallel, opposing surfaces and the lower ridged interior surfaces are second parallel, opposing surfaces;

the distance between the upper ridged interior surfaces perpendicular to the upper ridged interior surfaces is different than the distance between the lower ridged interior surfaces perpendicular to the lower ridged interior surfaces;

each of the plurality of connectors has at least two arms; and

each of the at least two arms (1) is above and parallel to the upper portion of one of the plurality of elongated ceiling grid members and (2) has at least one opening to receive a fastener to fasten the each of the at least two arms to the upper portion of the one of the plurality of elongated ceiling grid members.

[0008] In certain embodiments of the elongated ceiling grid members of this invention, the upper portion includes a first pair of spaced and substantially parallel sidewalls that (1) extend parallel to the longitudinal axis of the elongated ceiling grid member and (2) have ridged interior surfaces that face each other, the lower portion includes a second pair of spaced and substantially parallel sidewalls that extend parallel to the longitudinal axis, and the middle portion is configured such that (1) an upper surface of the middle portion and the

WHAT IS CLAIMED IS

1. An elongated ceiling grid member having a longitudinal axis and comprising:

an upper portion that extends along the longitudinal axis and is configured to receive and threadedly engage one or more fasteners along the longitudinal axis to connect at least two of the elongated ceiling grid members;

a lower portion that extends along the longitudinal axis and is configured to receive and threadedly engage fasteners of different diameters all along the longitudinal axis; and

a middle portion that connects the upper portion and the lower portion.

2. The elongated ceiling grid member of claim 1, wherein:

the upper portion includes a first pair of spaced and substantially parallel sidewalls that extend parallel to the longitudinal axis, the first pair of sidewalls having threaded interior surfaces that face each other;

the lower portion includes a second pair of spaced and substantially parallel sidewalls that extend parallel to the longitudinal axis; and

the middle portion is configured such that (1) an upper surface of the middle portion and the first pair of sidewalls define a top orifice and (2) a lower surface of the middle portion and the second pair of sidewalls define a bottom orifice;

each sidewall of the second pair of sidewalls includes upper and lower threaded interior surfaces;

the upper threaded interior surfaces are first parallel, opposing surfaces and the lower threaded interior surfaces are second parallel, opposing surfaces; and

the distance between the upper threaded interior surfaces perpendicular to the upper threaded interior surfaces is different than the distance between the lower threaded interior surfaces perpendicular to the lower threaded interior surfaces.

3. The elongated ceiling grid member of claim 2, wherein the distance between the upper threaded interior surfaces perpendicular to the upper threaded interior surfaces is less than the distance between the lower threaded interior surfaces perpendicular to the lower threaded interior surfaces.

4. The elongated ceiling grid member of claim 2, wherein the upper threaded interior surfaces of the second pair of sidewalls are located closer to the middle portion than the lower threaded interior surfaces of the second pair of sidewalls.

5. The elongated ceiling grid member of claim 4, wherein:

each of the lower threaded interior surfaces of the second pair of sidewalls includes a lower end located farthest from the middle portion;

the elongated ceiling grid member includes first and second elongated flanges positioned at the lower ends of the lower threaded interior surfaces; and

the first and second elongated flanges are substantially perpendicular to the lower threaded interior surfaces, do not extend between the lower threaded interior surfaces, and extend outwardly from the lower threaded interior surfaces.

6. The elongated ceiling grid member of claim 2, wherein the lower portion includes slanted interior surfaces between and connecting the upper and lower threaded interior surfaces of the second pair of sidewalls.

7. The elongated ceiling grid member of claim 2, wherein the threaded interior surfaces of the first pair of sidewalls and the upper and lower threaded interior surfaces of the second pair of sidewalls are configured to threadedly receive and engage threads of threaded members.

8. The elongated ceiling grid member of claim 2, further comprising an elongated insert configured to engage the upper threaded interior surfaces.

9. The elongated ceiling grid member of claim 8, wherein the elongated insert does not extend between the lower threaded interior surfaces when in engagement with the

upper threaded interior surfaces.

10. The elongated ceiling grid member of claim 9, wherein:

each of the second pair of sidewalls includes a first slanted interior surface between the upper and lower threaded interior surfaces;

the elongated insert has ridged side surfaces and second slanted surfaces below the ridged side surfaces; and

the first slanted surface mates with the second slanted surfaces.

11. A ceiling grid assembly comprising:

a plurality of elongated ceiling grid members having ends, the ends being connected to form a grid of the plurality of elongated ceiling grid members, the elongated ceiling grid members having a longitudinal axis and comprising:

an upper portion that includes a first pair of spaced and substantially parallel sidewalls that extend parallel to the longitudinal axis, the first pair of sidewalls having ridged interior surfaces that face each other;

a lower portion that includes a second pair of spaced and substantially parallel sidewalls that extend parallel to the longitudinal axis; and

a middle portion that connects the upper portion and the lower portion and is configured such that (1) an upper surface of the middle portion and the first pair of sidewalls define a top orifice and (2) a lower surface of the middle portion and the second pair of sidewalls define a bottom orifice; and

a plurality of connectors for connecting the plurality of elongated ceiling grid members to form the grid of the plurality of elongated ceiling grid members; wherein:

each sidewall of the second pair of sidewalls includes upper and lower ridged interior surfaces;

the upper ridged interior surfaces are first parallel, opposing surfaces and the lower ridged interior surfaces are second parallel, opposing surfaces;

the distance between the upper ridged interior surfaces perpendicular to the upper ridged interior surfaces is different than the distance between the lower ridged interior surfaces perpendicular to the lower ridged interior surfaces;

each of the plurality of connectors has at least two arms; and

each of the at least two arms (1) is above and parallel to the upper portion of one of the plurality of elongated ceiling grid members and (2) has at least one opening to receive a fastener to fasten the each of the at least two arms to the upper portion of the one of the plurality of elongated ceiling grid members.

12. The ceiling grid assembly according to claim 11, wherein some of the plurality of connectors include a nut fillet (1) extending in the direction opposite from the plurality of elongated ceiling grid members and (2) configured to receive a threaded end of an elongated member.

13. The ceiling grid assembly according to claim 12, wherein the nut fillet is located at an intersection of the at least two arms.

14. The ceiling grid assembly according to claim 11, wherein at least one of the plurality of connectors includes a locating tab configured to be engaged by at least one of the plurality of elongated ceiling grid members to position the at least one of the plurality of elongated ceiling grid members relative to the at least one of the plurality of connectors.

15. The ceiling grid assembly according to claim 14, wherein an end of the at least one of the plurality of elongated ceiling grid members abuts the locating tab.

16. The ceiling grid assembly according to claim 11, further comprising elongated members having ends attached to the plurality of connectors and a ceiling.

17. The ceiling grid assembly according to claim 11, wherein a first threaded member of a first size is connected to the upper ridged interior surfaces of the second pair of sidewalls and a second threaded member of a second size is connected to the lower ridged interior surfaces of the second pair of sidewalls, with the second size being different than the

first size.

18. The ceiling grid assembly according to claim 11, wherein the distance between the upper ridged interior surfaces perpendicular to the upper ridged interior surfaces is less than the distance between the lower ridged interior surfaces perpendicular to the lower ridged interior surfaces.

19. The ceiling grid assembly according to claim 18, wherein a first threaded member of a first size is connected to the upper ridged interior surfaces of the second pair of sidewalls and a second threaded member of a second size is connected to the lower ridged interior surfaces of the second pair of sidewalls.

20. The ceiling grid assembly according to claim 19, wherein the first and second threaded members attach accessories to the plurality of elongated ceiling grid members.