as concrete or masonry stair towers and elevator hoistways.

There is a need for a panelized and modular system for constructing and assembling buildings without relying on concrete and/or structural steel framing, heavy steel let-in bracing, and heavy steel and/or concrete panels.

Summary of Invention

In accordance with first aspect of the embodiment, there is provided a building section comprising:

a first structural column having a top connector and a bottom connector;

a second structural column having a top connector and a bottom connector, wherein the top connector of the first structural column is connected directly to the bottom connector of the second structural column so that the first and second structural columns are directly connected and align vertically;

a first structural truss panel attached to the first structural column; and,

a second structural truss panel attached to the second structural column such that the first and second structural truss panels transfer vertical live and dead loads and lateral loads on the first and second structural truss panels laterally to the first and second structural columns and then vertically through the first and second structural columns, wherein a clearance exists between the first and second truss panels and between the first and second truss panels and any floor connected to the first and second truss panels such that load is not transferred between the first and second truss panels.

In accordance with second aspect of the embodiment, there is provided an integrated structural truss panel configured to laterally transfer vertical live and dead load and lateral load to a structural column in a building comprising:

first, second, third, and fourth horizontal elongated members;

first and second vertical elongated members fastened to the first, second, third, and fourth horizontal elongated members such that the first and fourth horizontal elongated members form respectively a top and a bottom of the structural truss panel, such that the first and second vertical elongated members form respective sides of the structural truss panel, such that first, second, and third horizontal elongated members form an integrated web truss for attachment to floor and/or ceiling trusses, and such that the second and third horizontal elongated members form a continuous double horizontal brace that connects to each of the first and second vertical elongated members and that continuously bridges between the first and second vertical elongated members forming the sides of the structural truss panel; and,

an angled webbing fastened between the first and second vertical elongated members and the first and second horizontal elongated members thereby creating an integrated web truss within the structural truss panel whereby the integrated web truss acts as a transfer beam and facilitates the lateral transfer of vertical live and dead load and lateral load on the structural truss panel to the structural column.

In accordance with third aspect of the embodiment, there is provided a structural panel for a building comprising:

first, second, third, and fourth horizontal elongated members;

first and second vertical elongated members fastened to the first, second, third, and fourth horizontal elongated members such that the first and fourth horizontal elongated members form respectively a top and a bottom of the structural panel, such that the first and second vertical elongated members form respective sides of the panel, and such that the second and third horizontal elongated members form a continuous double horizontal brace that connects at each of the first and second vertical elongated members and that bridges between the first and second vertical elongated members that form the sides of the structural panel; and,

wherein at least one of the horizontal and vertical elongated members comprises a stud, wherein at least another one of the horizontal and vertical elongated members comprises a track, wherein the track comprises a track web and first and second track flanges, wherein the first and second track flanges extend in the same direction at substantially right angles from opposing sides of the track web, wherein the stud comprises a stud web and first and second stud flanges, wherein the first and second stud flanges extend in the same direction at substantially right angles from opposing sides of the stud web, and wherein the track web is wider than the stud web such the stud can be fitted within the track.

In accordance with fourth aspect of the embodiment, there is provided a method of constructing a building comprising:

fastening a first structural truss panel to a first structural column;

fastening a second structural column vertically directly to the first structural column; and,

fastening a second structural truss panel to the second structural column so that the second structural truss panel is vertically above the first structural truss panel, so that a clearance is between the first and second structural truss panels, and so that vertical live and dead load and lateral load are transferred laterally to the first and second structural columns and then vertically between the first and second columns rather than vertically structural truss panel to structural truss panel.

In accordance with fifth aspect of the embodiment, there is provided a method of constructing a building having at least six stories comprising:

fastening a first unified structural truss panel to a second unified structural truss panel, wherein the first unified structural truss panel comprises a first structural truss panel and a first structural column, wherein the second unified structural truss panel comprises a second structural truss panel and a second structural column, and wherein the first unified

structural truss panel is fastened to the second unified structural truss panel by fastening the first and second structural columns vertically and directly to one an other;

fastening a third unified structural truss panel to the second unified structural truss panel, wherein the third unified structural truss panel comprises a third structural truss panel and a third structural column, and wherein the third unified structural truss panel is fastened to the second unified structural truss panel by fastening the third structural column vertically and directly to the second structural column;

fastening a fourth unified structural truss panel to the third unified structural truss panel, wherein the fourth unified structural truss panel comprises a fourth structural truss panel and a fourth structural column, and wherein the fourth unified structural truss panel is fastened to the third unified structural truss panel by fastening the fourth structural column vertically and directly to the third structural column;

fastening a fifth unified structural truss panel to the fourth unified structural truss panel,

wherein the fifth unified structural truss panel comprises a fifth structural truss panel and a fifth structural column, and wherein the fifth unified structural truss panel is fastened to the fourth unified structural truss panel by fastening the fifth structural column vertically and directly to the fourth structural column; and,

fastening a sixth unified structural truss panel to the fifth unified structural truss panel, wherein the sixth unified structural truss panel comprises a sixth structural truss panel and a sixth structural column, and wherein the sixth unified structural truss panel is fastened to the fifth unified structural truss panel by fastening the sixth structural column vertically and directly to the fifth structural column, whereby vertical live and dead loads and lateral loads acting on the individual structural truss panels do not transfer vertically panel to panel but rather laterally from the structural truss panels to the structural columns and then vertically from structural column to structural column.

Brief Description of the Drawings

Figure 1 illustrates a stud for use as a framing member in horizontal truss panels;

Figure 2 illustrates a track for use as a framing member in horizontal truss panels;

Figures 3 and 3.1 illustrate a V-Braced horizontal truss panel;

Figures 4, 4.1, and 4.2 illustrate various open horizontal truss panels;

Figure 5 illustrates a truss for attachment to horizontal truss panels;

Figure 6 illustrates a structural column assembly for attaching horizontal truss panels to one another;

Figures 7 and 8 show the manner of attaching a horizontal truss panel such as shown in Figures 3, 3.1,

AMENDED CLAIMS
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1. A building section comprising:

a first structural column having a top connector and a bottom connector;

a second structural column having a top connector and a bottom connector, wherein the top connector of the first structural column is connected directly to the bottom connector of the second structural column so that the first and second structural columns are directly connected and align vertically;

a first structural truss panel attached to the first structural column; and,

a second structural truss panel attached to the second structural column such that the first and second structural truss panels transfer vertical live and dead loads and lateral loads on the first and second structural truss panels laterally to the first and second structural columns and then vertically through the first and second structural columns, wherein a clearance exists between the first and second truss panels and between the first and second truss panels and any floor connected to the first and second truss panels such that load is not transferred between the first and second truss panels.

2. The building section of claim 1 wherein the bottom connector of each of the first and second structural columns comprises a bottom connector plate having at least one hole extending therethrough, wherein the top connector of each of the first and second structural columns comprises a top connector plate having at least one bolt or screw projecting upwardly therefrom, and wherein hole of the bottom connector plate of the second structural column receives the bolt or screw of the top connector plate of the first structural column for fastening the first and second structural columns directly together vertically.

3. The building section of claim 2 further comprising first and second stud sections and first and second attachment plates, wherein the first stud section is attached to the first structural column, wherein the second stud section is attached to the second structural column, wherein the first attachment plate fastens the side of the first structural truss panel to the first stud section facilitating the transfer of vertical live and dead load and lateral load acting on the first structural truss panel through the first stud section to

the first structural column, and wherein the second attachment plate fastens the side of the second structural truss panel to the second stud section facilitating the transfer of vertical live and dead load and lateral load acting on the second structural truss panel through the second stud section to the second structural column.

4. The building section of claim 3 wherein each of the first and second stud sections comprises a web, first and second flanges, and first and second lips, wherein the first and second flanges extend in the same direction at substantially right angles from opposing sides of the web, and wherein the first and second lips extend inwardly from ends of the first and second flanges such that the first and second lips parallel the web.

5. The building section of claim 3 further comprising:

a third structural truss panel attached to the first structural column;

a fourth structural truss panel attached to the second structural column such that the third and fourth structural truss panels align vertically and such that a

clearance exists between the third and fourth structural truss panels so that vertical live and dead load and lateral load are transferred laterally through the third and fourth structural truss panels to the first and second structural columns and then vertically rather than vertically between the third and fourth structural truss panels;

and third and fourth stud sections, wherein the third stud section is attached to the first structural column, wherein the fourth stud section is attached to the second structural column, wherein the first attachment plate fastens the side of the third structural truss panel to the first stud section facilitating the transfer of vertical live and dead load and lateral load acting on the third structural truss panel through the third stud section to the first structural column, and wherein the second attachment plate fastens the side of the fourth structural truss panel to the second stud section facilitating the transfer of vertical live and dead load and lateral load acting on the fourth structural truss panel through the fourth stud section to the second structural column.

6. The building section of claim 1 wherein first and second structural truss panels comprise framing members roll formed from 18 to 14, inclusive, gauge steel.

7. An integrated structural truss panel configured to laterally transfer vertical live and dead load and lateral load to a structural column in a building comprising:

first, second, third, and fourth horizontal elongated members;

first and second vertical elongated members fastened to the first, second, third, and fourth horizontal elongated members such that the first and fourth horizontal elongated members form respectively a top and a bottom of the structural truss panel, such that the first and second vertical elongated members form respective sides of the structural truss panel, such that first, second, and third horizontal elongated members form an integrated web truss for attachment to floor and/or ceiling trusses, and such that the second and third horizontal elongated members form a continuous double horizontal brace that connects to each of the first and second vertical elongated members and that

continuously bridges between the first and second vertical elongated members forming the sides of the structural truss panel; and,

an angled webbing fastened between the first and second vertical elongated members and the first and second horizontal elongated members thereby creating an integrated web truss within the structural truss panel whereby the integrated web truss acts as a transfer beam and facilitates the lateral transfer of vertical live and dead load and lateral load on the structural truss panel to the structural column.

8. The integrated structural truss panel of claim 7 wherein the first, second, third, and fourth elongated members comprises corresponding first, second, third, and fourth tracks, wherein each of first, second, third, and fourth tracks comprises a track web, first and second track flanges, and first and second track lips, wherein the first and second track flanges extend in the same direction at substantially right angles from opposing sides of the track web, and wherein the first and second track lips extend inwardly from ends of the first and second track flanges such that the first and second track lips parallel the track web;

and further wherein the first and second vertical elongated members comprise corresponding first and second studs, wherein each of first and second studs comprises a stud web, first and second stud flanges, and first and second stud lips, wherein the first and second stud flanges extend in the same direction at substantially right angles from opposing sides of the stud web, wherein the first and second stud lips extend inwardly from ends of the first and second stud flanges such that the first and second stud lips parallel the stud web, and wherein the track web is wider than the stud web such the first and second studs can be fitted within the first, second, third, and fourth tracks.

9. The integrated structural truss panel of claim 8 wherein each of the first, second, third, and fourth tracks and each of the first and second studs comprises light gauge steel of between 18 and 14 gauge inclusive.

10. The integrated structural truss panel of claim 7 wherein the integrated structural truss panel further comprises third, fourth, and fifth vertical elongated members fastened to the first, second, third,

and fourth horizontal elongated members such that the fourth vertical elongated member is substantially centered between the first and second vertical elongated members, such that third vertical elongated member is between the first and fourth vertical elongated members, and such that the fifth vertical elongated member is between the fourth and second vertical elongated members.

11. The integrated structural truss panel of claim 10 wherein the first, second, third, and fourth horizontal elongated members comprises corresponding first, second, third, and fourth tracks, wherein each of first, second, third, and fourth tracks comprises a track web, first and second track flanges, and first and second track lips, wherein the first and second track flanges extend in the same direction at substantially right angles from opposing sides of the track web, and wherein the first and second track lips extend inwardly from ends of the first and second track flanges such that the first and second track lips parallel the track web;

and further wherein the first, second, third, fourth, and fifth vertical elongated members comprise corresponding first, second, third, fourth, and fifth studs, wherein each of first, second, third, fourth, and

fifth studs comprises a stud web, first and second stud flanges, and first and second stud lips, wherein the first and second stud flanges extend in the same direction at substantially right angles from opposing sides of the stud web, wherein the first and second stud lips extend inwardly from ends of the first and second stud flanges such that the first and second stud lips parallel the stud web, and wherein the track web is wider than the stud web such the first, second, third, fourth, and fifth studs can be fitted within the first, second, third, and fourth tracks.

12. The integrated structural truss panel of claim 11 wherein each of the first, second, third, and fourth tracks and each of the first, second, third, fourth, and fifth studs comprises light gauge steel of between 18 and 14 gauge inclusive.

13. The integrated structural truss panel of claim 10 further comprising:

a first brace member fastened to the first and third vertical elongated members and to the fourth horizontal elongated member; and,

a second brace member fastened to the second and fifth vertical elongated members and to the fourth horizontal elongated member, wherein the first and second brace member form an integrated V-brace in the structural truss panel designed to laterally transfer lateral load on the structural V-Braced panel to the structural column.

14. The integrated structural truss panel of claim 13 further comprising a third brace member between the third and fifth vertical elongated members and fastened to the third, fourth, and fifth vertical elongated members.

15. The integrated structural truss panel of claim 7 further comprising:

a first truss hangar fastened to the first horizontal elongated member, wherein the first truss hangar is arranged to fasten to a ceiling or floor truss at a side of the integrated structural truss panel between the continuous double horizontal brace and the first horizontal elongated member; and,

a second truss hangar fastened to at least one of the third and second horizontal elongated member,

wherein the second truss hangar is arranged to fasten to the ceiling or floor truss at a side of the integrated structural truss panel between the continuous double horizontal brace and the first horizontal elongated member.

16. The integrated structural truss panel of claim 15 wherein the ceiling or floor truss comprises:

a first horizontal truss member fastened to the first truss hangar;

a second horizontal truss member fastened to the second truss hangar; and,

a plurality of angled members fastened to the first and horizontal truss members.

17. The integrated structural truss panel of claim 16 wherein each of the first and second horizontal elongated members and the angled members comprises a stud having a stud web, first and second stud flanges, and first and second stud lips, wherein the first and second stud flanges extend in the same direction at substantially right angles from opposing sides of the stud web, and wherein the first and second stud lips extend inwardly from ends of the first and second stud

flanges such that the first and second stud lips parallel the stud web.

18. The integrated structural truss panel of claim 7 wherein each of the first, second, third, and fourth horizontal elongated members and each of the first and second vertical elongated member comprises light gauge steel of between 18 and 14 gauge inclusive.

19. A structural panel for a building comprising:

first, second, third, and fourth horizontal elongated members;

first and second vertical elongated members fastened to the first, second, third, and fourth horizontal elongated members such that the first and fourth horizontal elongated members form respectively a top and a bottom of the structural panel, such that the first and second vertical elongated members form respective sides of the panel, and such that the second and third horizontal elongated members form a continuous double horizontal brace that connects at each of the first and second vertical elongated members and that

bridges between the first and second vertical elongated members that form the sides of the structural panel; and,

wherein at least one of the horizontal and vertical elongated members comprises a stud, wherein at least another one of the horizontal and vertical elongated members comprises a track, wherein the track comprises a track web and first and second track flanges, wherein the first and second track flanges extend in the same direction at substantially right angles from opposing sides of the track web, wherein the stud comprises a stud web and first and second stud flanges, wherein the first and second stud flanges extend in the same direction at substantially right angles from opposing sides of the stud web, and wherein the track web is wider than the stud web such the stud can be fitted within the track.

20. The structural panel of claim 19 wherein the track further comprises first and second track lips, wherein the first and second track lips extend inwardly from ends of the first and second track flanges such that the first and second track lips parallel the track web, wherein the stud further comprises first and second stud lips, and wherein the first and second stud lips extend

inwardly from ends of the first and second stud flanges such that the first and second stud lips parallel the stud web.

21. The structural panel of claim 19 wherein each of the track and the stud comprises light gauge steel of between 18 and 14 gauge inclusive.

22. The structural panel of claim 19 wherein the structural panel further comprises third, fourth, and fifth vertical elongated members fastened to the first, second, third, and fourth horizontal elongated members such that fourth vertical elongated member is substantially centered between the first and second vertical elongated members, such that third vertical elongated member is between the first and fourth vertical elongated members, and such that the fifth vertical elongated member is between the fourth and second vertical elongated members.

23. The structural panel of claim 22 further comprising:

a first brace member fastened to first and third vertical elongated members and to the fourth horizontal elongated member; and,

a second brace member fastened to second and fifth vertical elongated members and to the fourth horizontal elongated member, wherein the first and second brace member form an integrated V-brace in the structural panel designed to transfer lateral load on the structural V-Braced panel to a structural column.

24. The structural panel of claim 23 further comprising a third brace member between the third and fifth vertical elongated members and fastened to the third, fourth, and fifth vertical elongated members.

25. A method of constructing a building comprising:

fastening a first structural truss panel to a first structural column;

fastening a second structural column vertically directly to the first structural column; and,

fastening a second structural truss panel to the second structural column so that the second structural truss panel is vertically above the first

structural truss panel, so that a clearance is between the first and second structural truss panels, and so that vertical live and dead load and lateral load are transferred laterally to the first and second structural columns and then vertically between the first and second columns rather than vertically structural truss panel to structural truss panel.

26. The method of claim 25 further comprising:

fastening a third structural truss panel to the first structural column; and,

fastening a fourth structural truss panel to the second structural column so that the fourth structural truss panel is vertically above the third structural truss panel, so that a clearance is between the third and fourth structural truss panels, and so that vertical live and dead loads and lateral loads on the third and fourth structural truss panels are transferred laterally through the third and fourth structural truss panels to the first and second structural columns rather than from structural truss panel to structural truss panel.

27. The method of claim 25 further comprising:

fastening a first floor and/or ceiling truss to an integrated truss portion of the first structural truss panel so that the first floor and/or ceiling truss supports a member comprising a ceiling of a first space defined at least partially by the first structural truss panel and a floor of a second space defined at least partially by the second structural truss panel; and,

fastening a second floor and/or ceiling truss to an integrated truss portion of the second structural truss panel so that the second floor and/or ceiling truss supports a member comprising a ceiling of the second space and a floor of a third space above the second space.

28. The method of claim 25 further comprising:

fastening a third structural column vertically and directly to the second structural column;

fastening a third structural truss panel to the third structural column vertically above the second structural truss panel;

fastening a fourth structural column vertically and directly to the third structural column;

fastening a fourth structural truss panel to the fourth structural column vertically above the third structural truss panel;

fastening a fifth structural column vertically and directly to the fourth structural column;

fastening a fifth structural truss panel to the fifth structural column vertically above the fourth structural truss panel;

fastening a sixth structural column vertically and directly to the fifth structural column; and,

fastening a sixth structural truss panel to the sixth structural column vertically above the fifth structural truss panel;

wherein there is clearance between the first, second, third, fourth, fifth, and sixth structural truss panels so that vertical and lateral forces on the first, second, third, fourth, fifth, and sixth structural truss panels are transferred laterally from the first, second, third, fourth, fifth, and sixth structural truss panels to the first, second, third, fourth, fifth, and sixth structural columns and then vertically downward rather than vertically between the first, second, third, fourth, fifth, and sixth structural truss panels.

29. The method of claim 28 wherein all of the structural truss panels are constructed from studs comprising light gauge steel of between 18 and 14 gauge inclusive.

30. The method of claim 29 wherein each of the studs comprises a stud web, first and second stud flanges, and first and second stud lips, wherein the first and second stud flanges extend in the same direction at substantially right angles from opposing sides of the stud web, wherein the first and second stud lips extend inwardly from ends of the first and second stud flanges such that the first and second stud lips parallel the stud web.

31. A method of constructing a building having at least six stories comprising:

fastening a first unified structural truss panel to a second unified structural truss panel, wherein the first unified structural truss panel comprises a first structural truss panel and a first structural column, wherein the second unified structural truss panel comprises a second structural truss panel and a second structural column, and wherein the first unified

structural truss panel is fastened to the second unified structural truss panel by fastening the first and second structural columns vertically and directly to one an other;

fastening a third unified structural truss panel to the second unified structural truss panel, wherein the third unified structural truss panel comprises a third structural truss panel and a third structural column, and wherein the third unified structural truss panel is fastened to the second unified structural truss panel by fastening the third structural column vertically and directly to the second structural column;

fastening a fourth unified structural truss panel to the third unified structural truss panel, wherein the fourth unified structural truss panel comprises a fourth structural truss panel and a fourth structural column, and wherein the fourth unified structural truss panel is fastened to the third unified structural truss panel by fastening the fourth structural column vertically and directly to the third structural column;

fastening a fifth unified structural truss panel to the fourth unified structural truss panel,

wherein the fifth unified structural truss panel comprises a fifth structural truss panel and a fifth structural column, and wherein the fifth unified structural truss panel is fastened to the fourth unified structural truss panel by fastening the fifth structural column vertically and directly to the fourth structural column; and,

fastening a sixth unified structural truss panel to the fifth unified structural truss panel, wherein the sixth unified structural truss panel comprises a sixth structural truss panel and a sixth structural column, and wherein the sixth unified structural truss panel is fastened to the fifth unified structural truss panel by fastening the sixth structural column vertically and directly to the fifth structural column, whereby vertical live and dead loads and lateral loads acting on the individual structural truss panels do not transfer vertically panel to panel but rather laterally from the structural truss panels to the structural columns and then vertically from structural column to structural column.

32. The method of claim 31 further comprising:

fastening a first floor and/or ceiling truss to the first structural truss panel so that the first floor and/or ceiling truss supports a member comprising a ceiling of a first space defined at least partially by the first structural truss panel and a floor of a second space defined at least partially by the second structural truss panel;

fastening a second floor and/or ceiling truss to the second structural truss panel so that the second floor and/or ceiling truss supports a member comprising a ceiling of the second space and a floor of a third space above the second space;

fastening a third floor and/or ceiling truss to the third structural truss panel so that the third floor and/or ceiling truss supports a member comprising a ceiling of the third space and a floor of the fourth space above the third space;

fastening a fourth floor and/or ceiling truss to the fourth structural truss panel so that the fourth floor and/or ceiling truss supports a member comprising a ceiling of the fourth space and a floor of the fifth space above the fourth space;

fastening a fifth floor and/or ceiling truss to the fifth structural truss panel so that the fifth floor

and/or ceiling truss supports a member comprising a ceiling of the fifth space and a floor of the sixth space above the fifth space; and,

fastening a sixth floor and/or ceiling truss to the sixth structural truss panel so that the sixth floor and/or ceiling truss supports a member comprising a ceiling of the sixth space.

33. The method of claim 31 wherein all of the structural truss panels are constructed from studs comprising light gauge steel of between 18 and 14 gauge inclusive.

34. The method of claim 33 wherein each of the studs comprises a stud web, first and second stud flanges, and first and second stud lips, wherein the first and second stud flanges extend in the same direction at substantially right angles from opposing sides of the stud web, wherein the first and second stud lips extend inwardly from ends of the first and second stud flanges such that the first and second stud lips parallel the stud web.