

Steel- and Glass Spaceframes between Art and Technology

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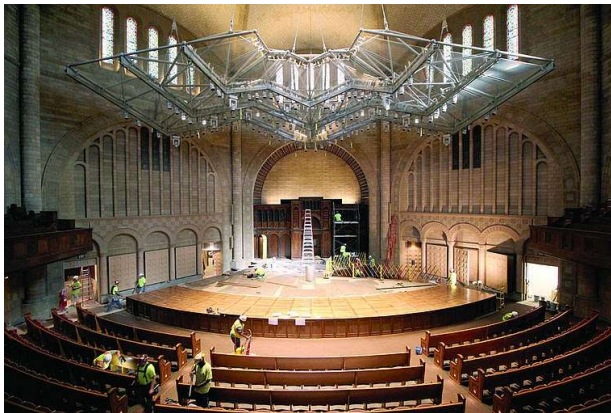
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Abstract

The evolution of spatial structures has not yet entered maturity, like ending in a final stadium of limited and permanent categories. In the contrary, with ever new ways of thinking about structures and materials, new forms and combinations are born, extending the shapes called spaceframes into new realms. Two examples will be presented in this paper. These projects build on experience with the sculpture “crane flight” by the artist Renato Santarossa [1], [2].

The first one is an acoustic screen in a concert hall in Cleveland. Over one hundred glass panels [count the exact number] hover above the orchestra, in a large historic building, whose perfect dome rendered the space acoustically difficult for music performances. Each of the glass panels is about 40 sqft [change to sqm], and each one is oriented in a different angle, so that the sound waves from the orchestra below are dissolved into a sort of echo-free, "white noise". The acoustic screen measures about 90 ft [change to meter] across. A "last-minute" redesign into a much lighter spaceframe turned a heavy beam assembly into a lighter, bat-like network of glass panels and thin steel struts.

The second example is also a hanging sculpture-like, organically shaped glass- and steel structure. Two oval rings formed of thin steel tubes carry two rows of tall glass panels, oriented like blades of a large fan or turbine. The glass panels, the steel rings, and three-dimensional custom-formed steel arms together form a stable structural system. The frosted glass disperses the light from a large skylight above and gives the room a dynamic and light atmosphere. The combination of linear truss elements, curved beam elements, and two-dimensional glass plates form a complicated, but stable assembly.



For both structures the aspect of artistic, sculptural expression is as important as the utilitarian purpose.

References

- [1] H. Klimke, C. Stutzki, R. Santarossa, et al.: “Spatial structure made of flat glass panes, bars, cables and connecting elements”, Patent Filing (Germany) No. DE19934391820, 1993
- [2] G. Sedlacek, J. GÜSGEN, J. KUCK,: “Calculation and design of the cable-tensioned structure Crane-flight made of glass and Steel”, in: *Der Stahlbau*, Berlin / Ernst & Sohn (1994)