F. L. KEPPLER.

TRANSPARENT CONCRETE STRUCTURE.

APPLICATION FILED OCT. 26, 1909.

1,035,360. **Patented Aug. 13, 1912.**

Fig. 1.

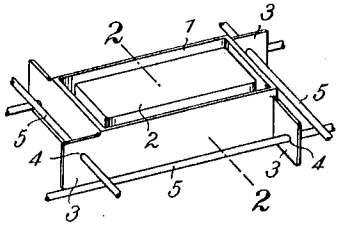


Fig. 2.

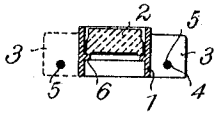


Fig. 3.

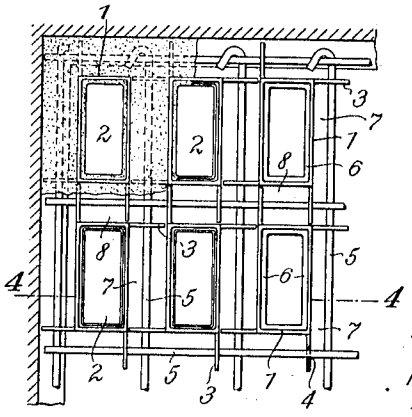


Fig. 4.

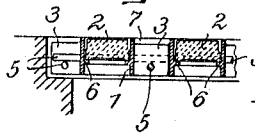


Fig. 5.

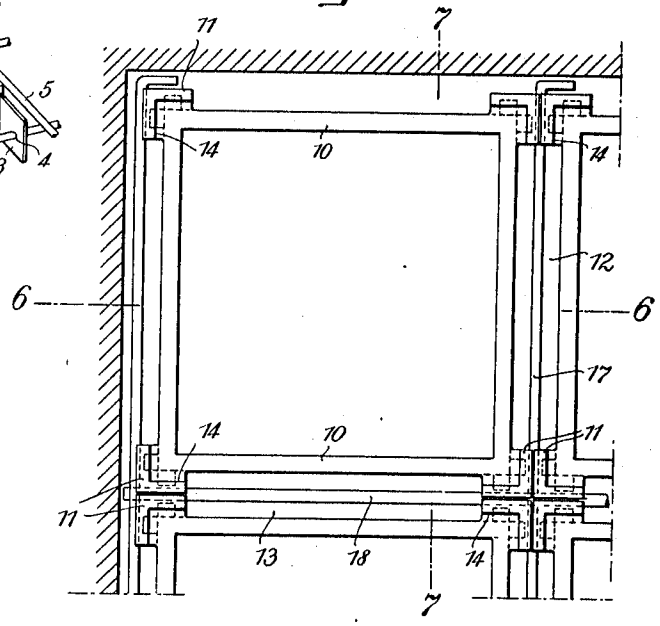


Fig. 6.

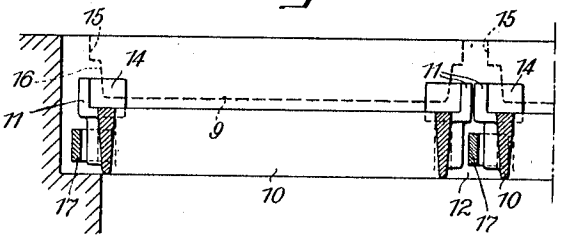


Fig. 7.

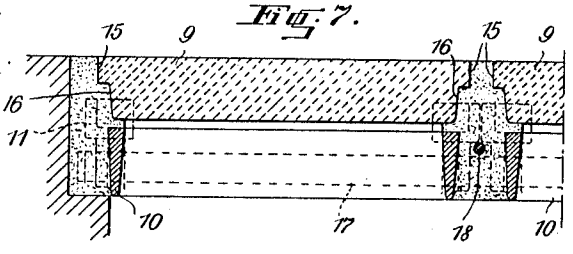
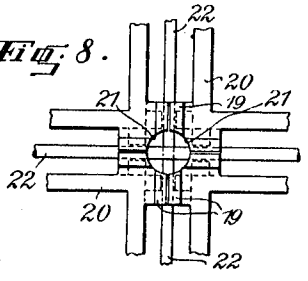


Fig. 8.



Witnesses:

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UNITED STATES PATENT OFFICE.

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TRANSPARENT CONCRETE STRUCTURE.

1,035,360. Specification of Letters Patent. Patented Aug. 13, 1912.

Application filed October 26, 1909. Serial No. 524,756.

To all whom it may concern:

Be it known that I, FRIEDRICH LUDWIG KEPPLER, a citizen of the United States of America, and resident of Weissensee, near Berlin, Germany, have invented certain new and useful Improvements in Transparent Concrete Structures, of which the following is a full, clear, and exact specification.

My invention relates to the application of transparent concrete structures, more particularly in respect to the building of ceilings, floors, walls etc.

The object of my invention is to create structures of great resistance against stress and strain, affording at the same time as large an area as possible for the passage of the light.

My invention consists in the application of metal frames having lateral edges or projections, and adapted to support glass bodies of suitable form in such a way, that a series of said frames form with their lateral projecting edges intermediate spaces between said frames which are to be suitably filled out with cement or other binding material. In order to give the whole structure the necessary resistance against strains and stresses, iron rods are placed between and adjacent to each individual frame, the remaining spaces being hereafter filled out with binding material. The aforesaid iron rods are secured in their position by the projecting edges or flanges of the metal frames, and are preferably so arranged as to support the latter directly.

In the accompanying drawings Figure 1 is a perspective view of a metal frame according to my invention, supporting a glass body and showing the connecting iron rods; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 shows a plan view of the corner of a concrete structure built up with elements according to Figs. 1 and 2; Fig. 4 is a section on the line 4—4 of Fig. 3; Fig. 5 shows a plan view of the corner of another concrete structure, wherein however the glass bodies and binding material have been omitted; Fig. 6 is a section on the line 6—6 of Fig. 5; Fig. 7 is a section on the line 7—7 of Fig. 5 showing the inserted glass bodies and the embedded binding material. Fig. 8 is a plan view of four cojoining corners of specially formed metal frames.

Figs. 1 and 2 show a building element consisting of the metal frame 1 supporting a glass body 2 and having rectangular form, each corner provided with a lateral flange-like extension 3. The extensions 3 are preferably made of equal length and provided with holes 4, which serve to receive the iron rods 5. The inside of the frame 1 is provided with a continuous ledge 6 for supporting the glass body 2.

In order to create a concrete structure of suitable size it is necessary to join a series of frames 1 in such a way that the extensions 3 form separate spaces lengthwise and crosswise 7 and 8 respectively, the breadth of which corresponds to the length of the extensions 3. The iron rods 5 are placed preferably crosswise in the above mentioned spaces 7 and 8, the latter being suitably filled out with cement or other binding material. The binding material unites the whole structure and forms together with the frame 1 and iron rods 5 a highly resistant structure, the transparency of this structure being provided for by the glass bodies 2 inserted in the metal frames 1. The glass bodies 2 as well as the metal frames 1 can be made in any shape or size, in order to meet the most diversified requirements of construction and art.

In the form of construction shown in Figs. 5 to 7 the metal frames 10 supporting the glass bodies 9 have a square form and are provided at all four corners with lateral projecting angular abutments 11, that is to say, each abutment has a horizontal member and a vertical or upright member. The breadth of the spaces 12 and 13 is determined by the dimensions of the adjoining abutments 11. The glass bodies 9 the sides 15 of which having undercut edges 16 are inserted in the frames 10 so that the inner surfaces 14 of the abutments 11 are opposite to the undercut edges 16. The rectangular iron rods 17 are placed in the longitudinal spaces 12 and the round iron rods 18 lie in the transverse spaces 13. The iron rods 17, 18 are not connected in any particular way to the abutments 11 of the frames 10, but are secured in their position by the binding material filling out the intermediate spaces. The sides 15 of the glass bodies 9 are undercut or tapered from the upper to the lower side, in order to obtain a maximum area for the passage of light.

Fig. 8 shows another form of the metal frames used for the concrete structures heretofore described and more particularly the corners 20 of said frames, which are pro-

vided with angular abutments 19 having an exterior recess 21. The four cojoining corners 20 each having an exterior recess 21 form an opening of suitable shape, which facilitates the insertion of the binding material at the junction of the frames and at the crossing of the iron rods 22 lying thereunder. By this means an otherwise weak point of the structure is efficiently strengthened. In other respects, that is to say, in regard to the glass bodies, metal rods and binding material, the elements of the structure would be the same as in Figs. 5 to 7.

The transparent concrete structures hereinbefore described can be made in various ways without departing from the spirit of my invention.

What I claim is:

1. In structures pervious to light, the combination of frames provided with spaced lateral projections to position adjacent frames and to form spaces between them, light-transmitting bodies extending over said projections, metal rods adjacent to said projections, and a binder filling the spaces between the said frames, bodies and rods.

2. In structures pervious to light, the combination of frames provided at their corners with spaced lateral projections to position adjacent frames and to form spaces between them, light-transmitting bodies set within said frames, and a binder for holding the frames and bodies together.

3. In structures pervious to light, the combination of frames provided at their corners with angular abutments projecting beyond each of the sides which meet at such corners, light-transmitting bodies extending over said abutments, and a binder for holding the frames and bodies together.

4. In transparent concrete structures, the combination of metal rods, frames located in the spaces between said rods and provided with angular abutments at the corners, each of said abutments having a horizontal member and an upright member; transparent bodies extending over the horizontal members of said angular abutments and a binder for holding the frames and bodies together.

5. In transparent structures, the combination of frames provided at the corners with angular abutments each of which has a horizontal member and an upright member, transparent bodies extending over the horizontal members of said abutments, and a binder for holding the frames and bodies together.

6. In structures pervious to light, the combination of frames provided at their corners with angular abutments projecting beyond each of the sides which meet at such corners, said abutments having exterior recesses, light-transmitting bodies extending over said abutments, and a binder filling said recesses and the spaces between the frames and bodies.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

FRIEDRICH LUDWIG KEPPLER.

Witnesses:

WOLDEMAR HAUPT,

HENRY HASPER.