No. 735,920. PATENTED AUG. 11. 1903.

F. VISINTINI.

LATTICE OR TRUSS GIRDER, &c.

APPLICATION FILED JAN. 26, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1

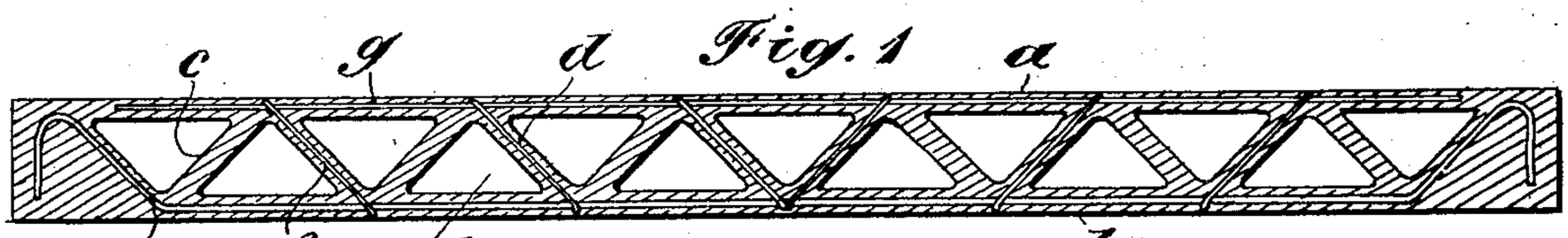


Fig. 2

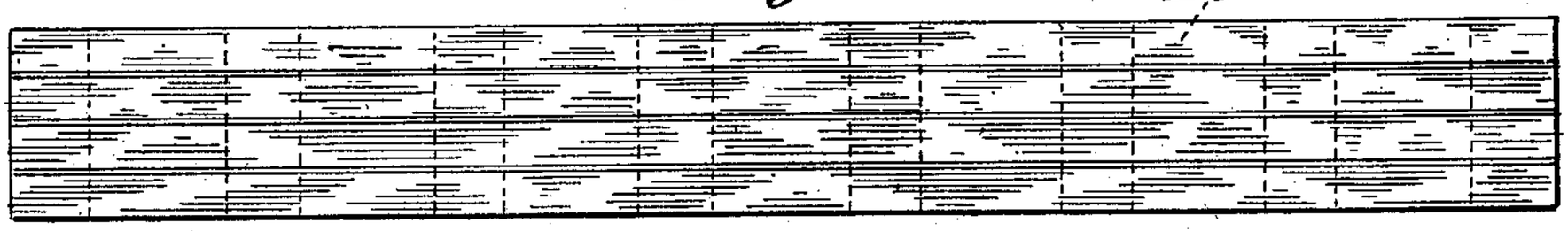


Fig. 3

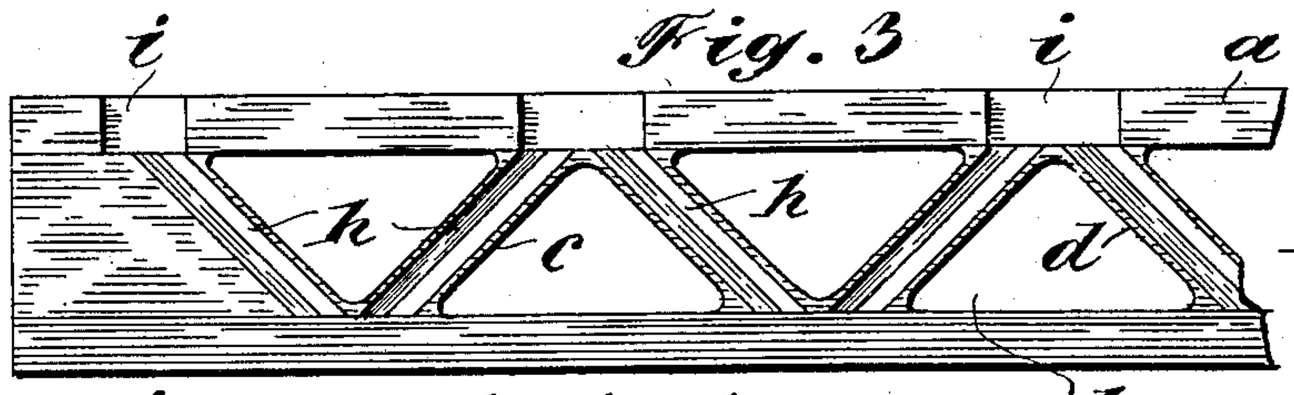


Fig. 6

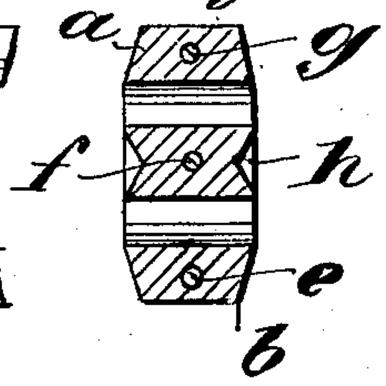


Fig. 4

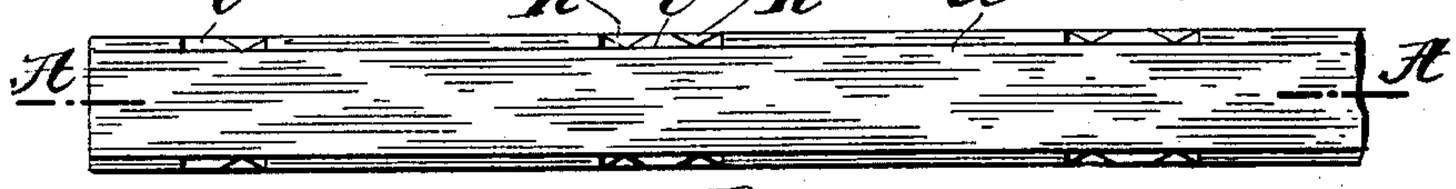


Fig. 5

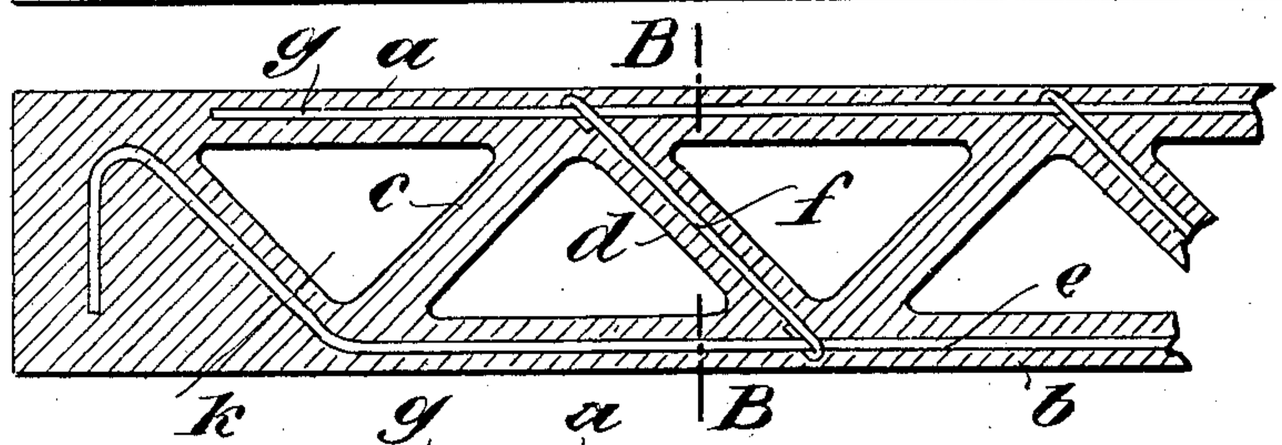


Fig. 7

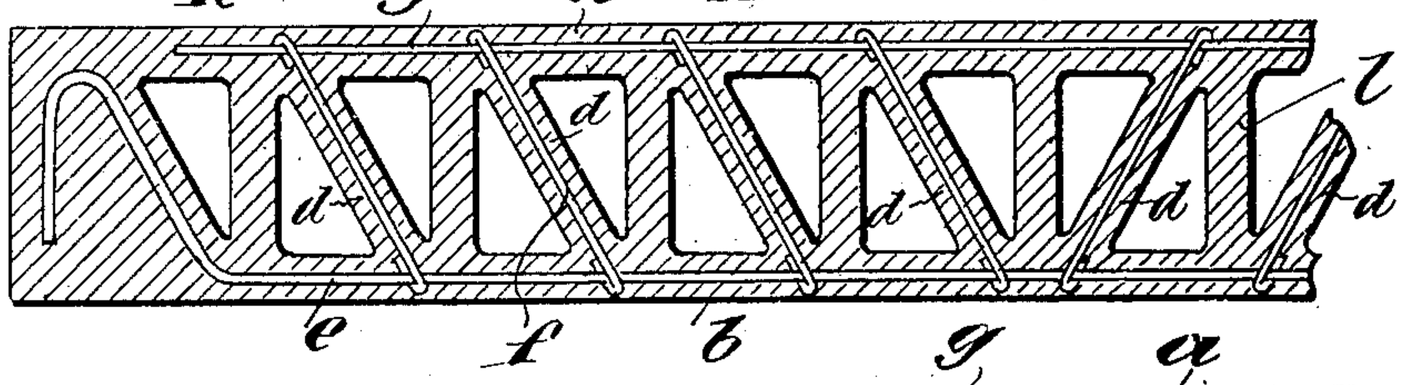
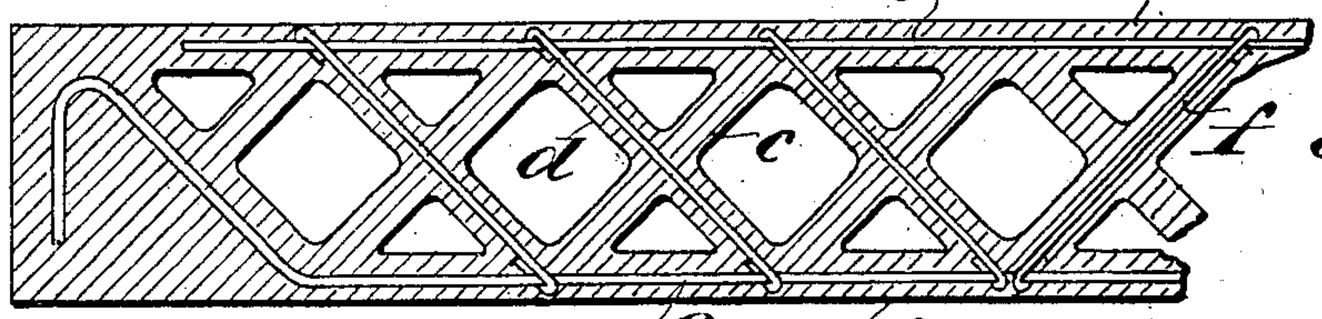


Fig. 8



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Inventor:
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No. 735,920. PATENTED AUG. 11, 1903.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 9

Fig. 10

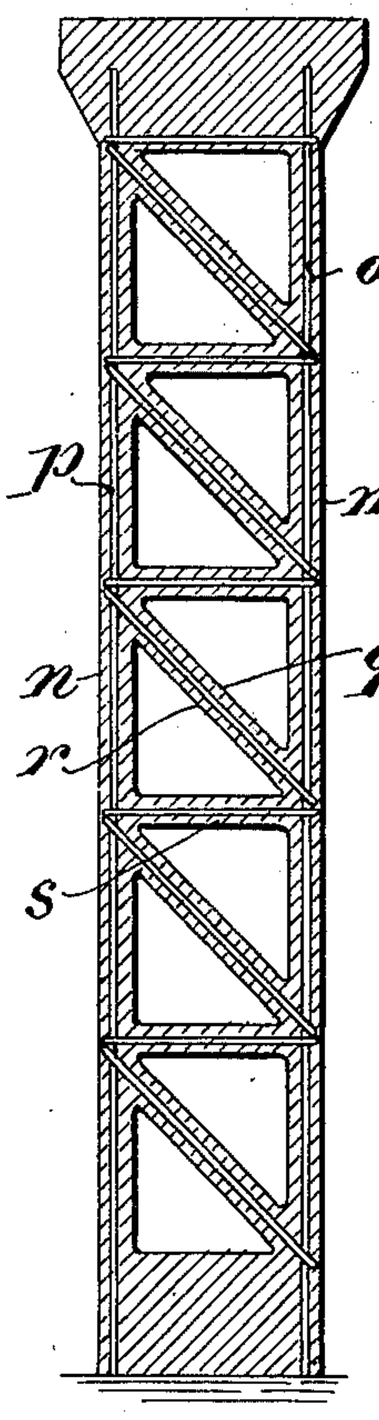


Fig. 11

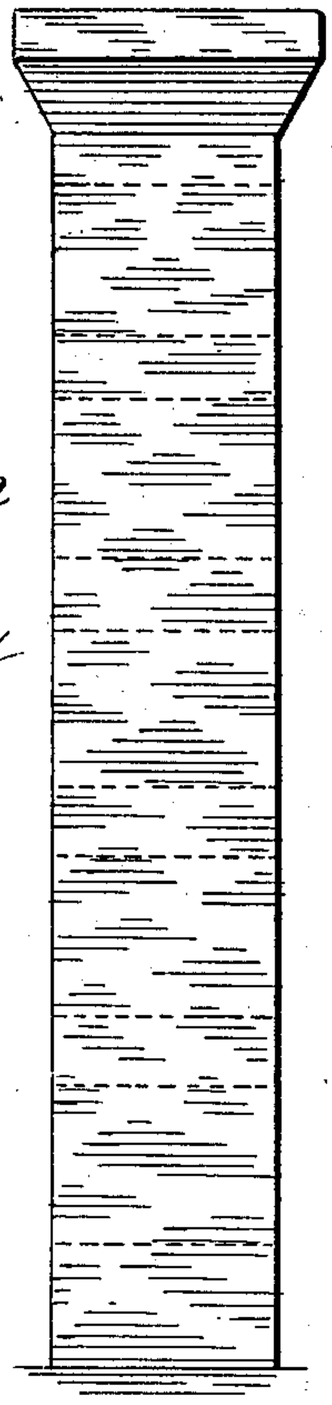
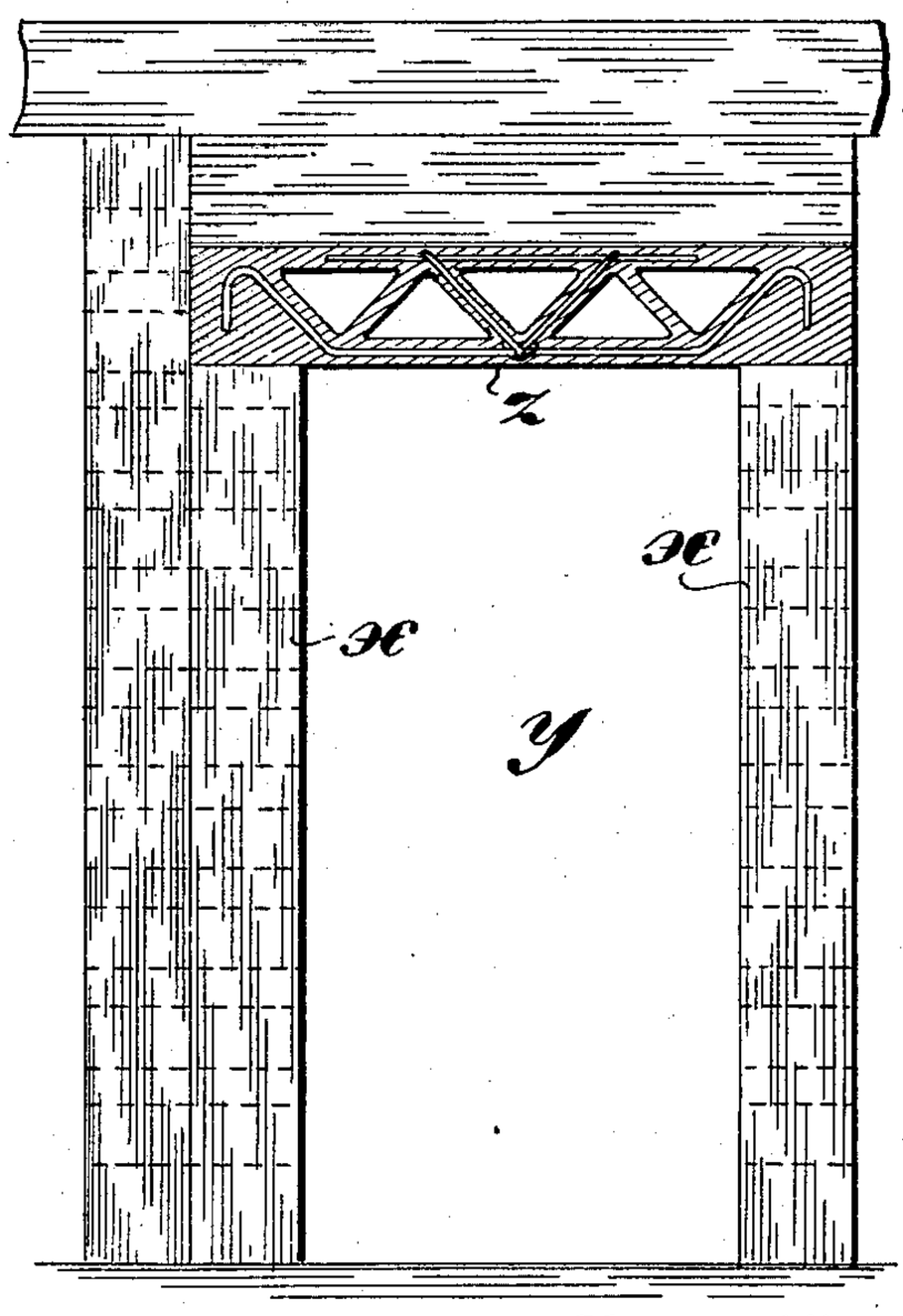


Fig. 12



a Fig. 13

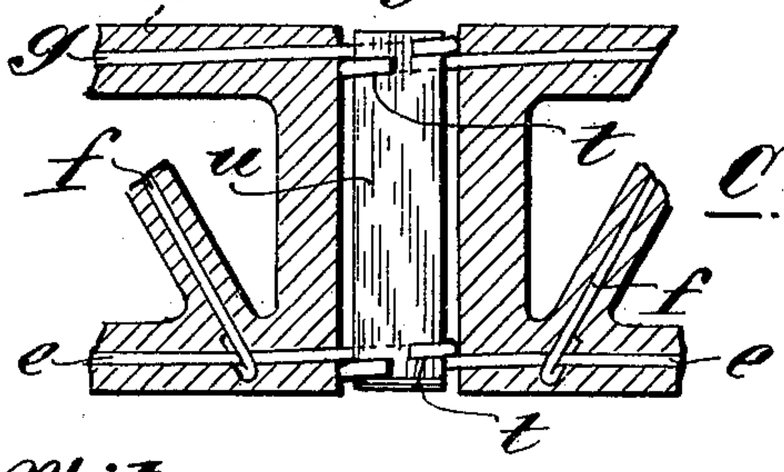


Fig. 14

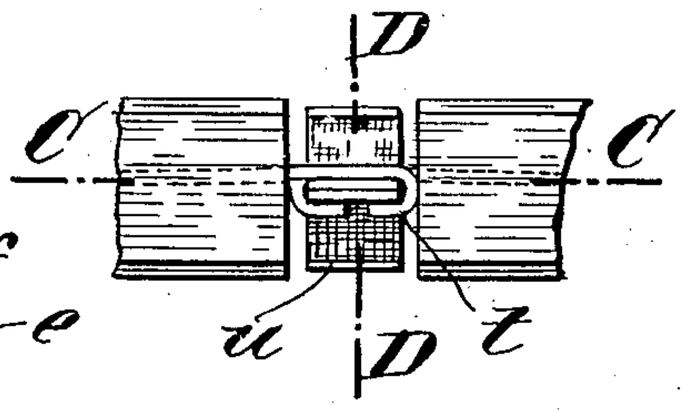
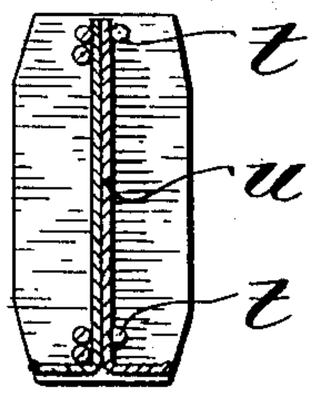


Fig. 15



Witnesses:
Gg. Weingärtner
Georg Hamm.

Inventor:
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No. 735,920. Patented August 11, 1903.

UNITED STATES PATENT OFFICE.

FRANZ VISINTINI, OF ZURICH, SWITZERLAND.

LATTICE OR TRUSS GIRDER, &c.

SPECIFICATION forming part of Letters Patent No. 735,920, dated August 11, 1903.

Application filed January 26, 1903. Serial No. 140,562. (No model.)

To all whom it may concern:

Be it known that I, FRANZ VISINTINI, a citizen of Görz, Austria-Hungary, and a resident of Zurich, Switzerland, have invented new and useful Improvements in and Relating to Lattice or Truss Girders and the Like, of which the following is a specification.

My invention has for its object improvements in lattice or truss girders the members (lattice-work) of which consist of artificial stone—for instance, beton—in which for the purpose of increasing the strength draw-bars are embedded in the parts affected by the tensional strain. Such lattice or truss girders may be employed in various ways—for instance, for forming ceilings and floors and making walls—and possesses various advantages in having the following properties: The girder corresponds to static requirements, as it is constructed exclusively according to the laws of statics. As the materials (beton and draw-bars) are only found at the parts of the lattice or truss girder on which the strain comes, the girder is comparatively light. The interstices in the lattice-work afford opportunity for good ventilation and also for heating ceilings, floors, and walls formed of such lattice-girders. Such a lattice-girder is also a bad conductor of sound and heat, so that it may be successfully employed as building material in all buildings requiring such properties.

The object of the invention is shown in some forms of construction as an example in the accompanying drawings, in which—

Figure 1 is a longitudinal view and partial side view, and Fig. 2 a plan view, of several truss or lattice girders placed side by side to form a ceiling or roof. Fig. 3 is a side view of a piece of the lattice-girder on an enlarged scale. Fig. 4 is a plan view of Fig. 3. Fig. 5 is a section on the line A A of Fig. 4. Fig. 6 is a section on the line B B of Fig. 5. Figs. 7 and 8 are longitudinal sections of other forms of girders. Fig. 9 is a longitudinal section of a domed lattice-girder having diagonals similar to those described in connection with the form of construction shown in Figs. 1 to 6. Figs. 10 and 11 are respectively a longitudinal section and side view of a column which is formed of a vertical lattice-girder. The vertical longitudinal members *m* and *n* contain draw-bars or anchors *o* and *p*, which are connected with tension-bars *r* in the diagonals *q*, and horizontal tension-bars *s* connect the bars *m* and *n*. Fig. 12 is an elevation of a wall formed of vertically-placed lattice-girders *x*, in which wall there is a doorway *y*, the lintel *z* of which is formed of a lattice-work girder. (Shown in section.) Fig. 13 is a longitudinal section on the line C C of Fig. 14, Fig. 14 a plan view, and Fig. 15 a cross-section on the line D D of Fig. 14, of a coupling for two lattice-work girders, the ends of which meet one another.

In the form of construction of the lattice-girder shown in Figs. 1 to 6 the girder has an upper longitudinal member or chord *a* and a lower longitudinal member or chord *b*, which are connected by diagonals *c* and *d*. The chords and diagonals are preferably made of an artificial stone—for instance, beton, cement, and the like—possessing a high resistance to compression and contain metal draw-bars in the parts subjected to tensional strain. The lower chord *b*, which is exposed to tensional strain, contains a draw-bar *e*, and the diagonals *d*, which are also exposed to tensile strain, contain draw-bars *f*, which are connected to the draw-bar *e* at the load-points, Fig. 5. In the upper chord *a* the draw-bars *f* connect with rods *g* at the load-points, and the latter also serve as an anchor for the other ends of the tension-rods *g* and as such have to absorb the differences of expansion of the bars meeting at the joints. The draw-bar *e* is bent upward obliquely at the ends of the girder, which are formed solid, and the ends of the bars are then carried downward, thus forming an anchorage in the body of the girder for these draw-bars. Interstices *k* are left between the diagonals. Grooves *h*, which connect above with recesses *i* in the vertical sides of the upper chord *a*, are formed on the exteriors of the diagonals, Figs. 3, 4, and 6. If several lattice-girders are united to form a ceiling, roof, or floor, their vertical side walls are so located that the diagonals of adjacent girders coincide, and the grooves *h*, which face one another in the joint, form a passage. In these passages a binding material—such, for instance, as cement—is poured through the recesses *i*, and by these means the girders are connected or keyed with one another.

In order to allow of the plaster being securely attached, the beams are somewhat beveled or tapered at the sides, Fig. 6. In placing the girders for forming ceilings, floors, or walls in position the interstices *k* between the diagonals of the adjacent beams lie in succession, so that they form transverse channels or passages through the girders. Such ceilings, floors, or walls may also serve as means for heating and ventilation, as it is possible, if required, to convey an air-current of suitable temperature through the passages.

Fig. 7 is a longitudinal section of another form of construction of the lattice-girder having vertical bars *l*, adapted to withstand a compression strain, and diagonals *d*, adapted to withstand a tensional strain, which vertical bars and diagonals are connected with an upper chord *a* and a lower chord *b*. Draw-bars *f* and *e* are passed through the diagonals and beams in a similar manner as in the form of construction shown in Figs. 1 to 6. This is also the case in the form of construction shown in longitudinal section in Fig. 8, in which diagonals *c* and *d* cross, one being adapted to sustain compression strain and the other tensional strain.

In Fig. 13 the rods or draw-bars *g* and *e* project from two lattice-girders standing with their ends opposite to one another, and the ends of these rods or draw-bars are bent round to form hooks *t* in such a way that the openings of the hooks of the opposing rods are directed against one another. The hooks of the rods *g* and *e* are located one above the other, and two plates *u* are vertically inserted through them, which plates are bent under the rods *e* in opposite directions. The plates *u* are engaged by the opposing hooks, so that they hold together the two lattice-girders. The interstices between the ends of the girders are filled up with a binding material—such, for instance, as beton or cement—the lower bent parts of the plates *u* preventing the binding material introduced from above from dropping down.

Having thus described my said invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. A concrete or cement beam having an upper chord, a continuous metallic anchor embedded therein, a lower chord, a continuous metallic tension member in said lower chord and anchored in the ends of the beam, tension members each having a metallic member embedded therein and connected to the continuous metallic anchor and to the continuous metallic tension member at the load-points, and compression members of concrete or cement only, substantially as described.

2. A concrete or cement beam having an upper chord, a continuous metallic rod embedded therein, the ends of said rod having hooks thereon projecting beyond the ends of the beam, a lower chord having a tension-rod embedded therein, the ends thereof having hooks projecting beyond the ends of the beam; in combination with one or more locking-plates to engage the hooks of adjacent beams and a plastic filler to cover the parts so locked, substantially as described.

3. A concrete or cement beam having an upper chord, a lower chord and tension and compression members, said tension and compression members having lateral recesses communicating with lateral recesses on the upper chord, whereby oppositely-situated recesses of adjacent beams may be filled with cement to key the beams together, substantially as described.

4. A concrete or cement beam having an upper chord with beveled sides and recesses in said sides at or about the load-points, a lower chord having beveled sides, and tension and compression members having lateral longitudinal recesses communicating with those in the upper chord, whereby oppositely-situated recesses of adjacent beams may be filled with cement to key the beams together, substantially as described.

5. A concrete or cement beam having an upper chord with beveled sides, and recesses formed in the sides at or about the load-points, a continuous anchor embedded in the upper chord, a lower chord, a continuous tension-rod embedded therein, tension and compression members, a rod in each tension member connected at one end to the anchor and at the other to the tension-rod at the load-points, substantially as described.

6. A concrete or cement beam having an upper chord with beveled sides and recesses formed in the sides at or about the load-points, a continuous anchor embedded in said chord having hooked ends projecting beyond the ends of the beam, a lower chord having a continuous tension-rod embedded therein with hooked ends projecting beyond the ends of the beam, tension and compression members having lateral grooves communicating with the recesses in the upper chord, and a rod embedded in each tension member and connected at one end to the anchor and at the other to the continuous tension-rod at the load-points, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

FRANZ VISINTINI.

Witnesses:

GG. WEINGÄRTNER,

GEORG HAMM.