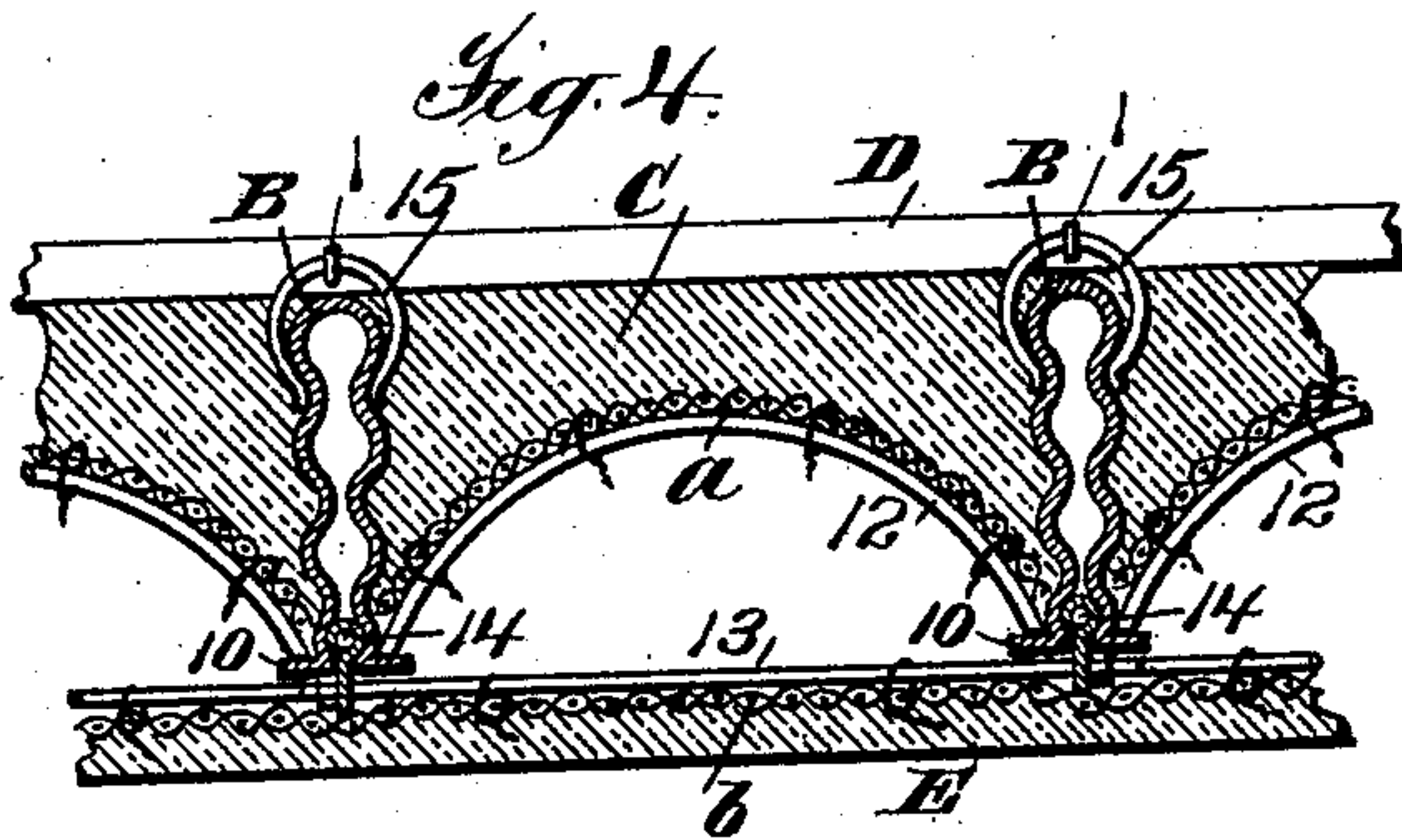
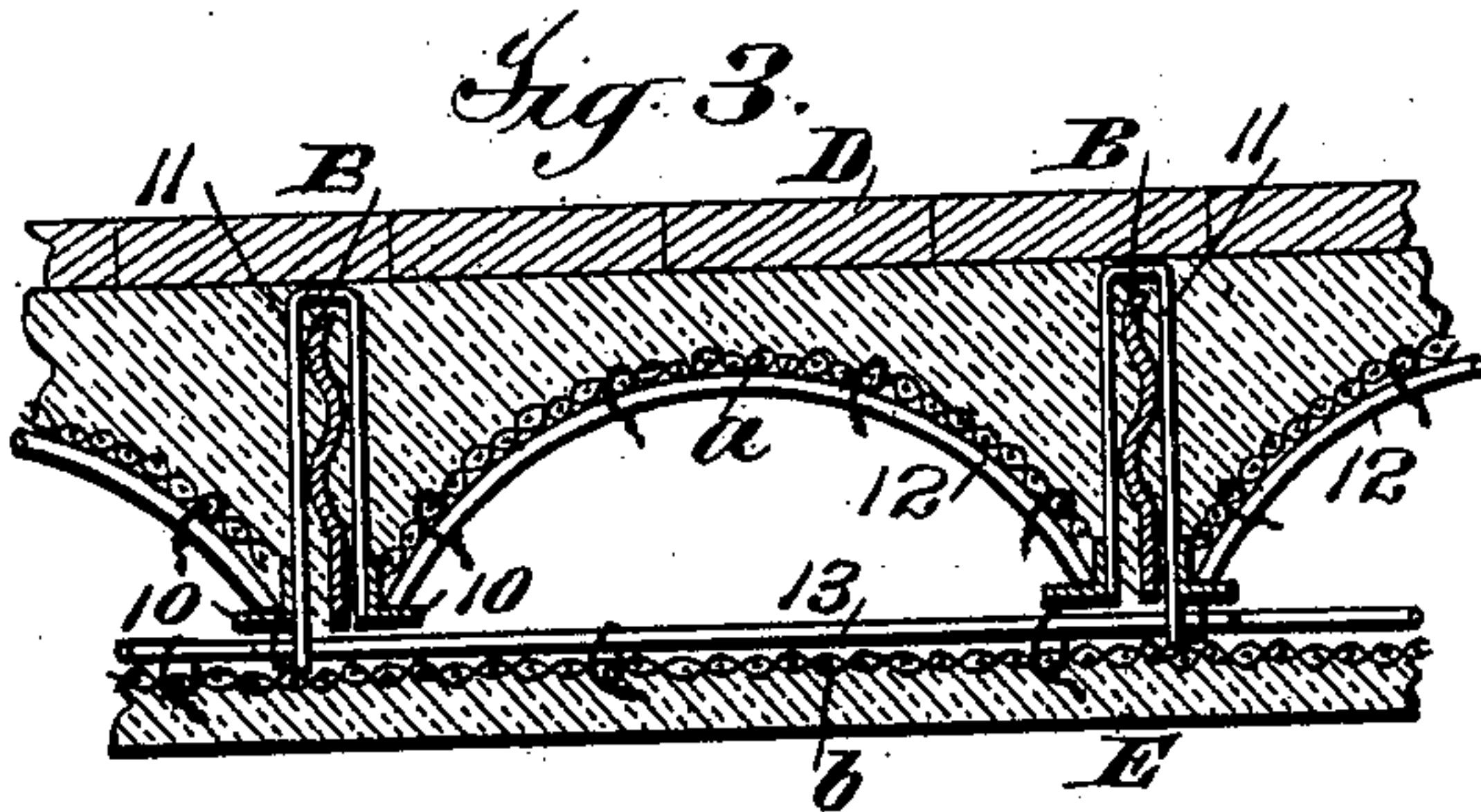
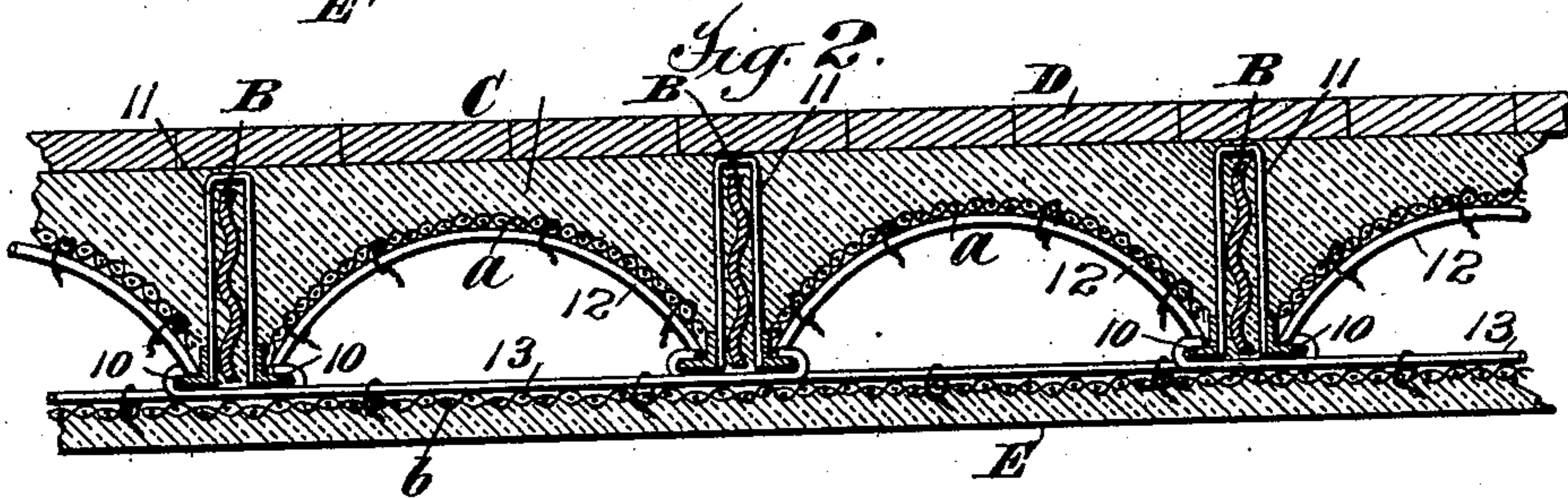
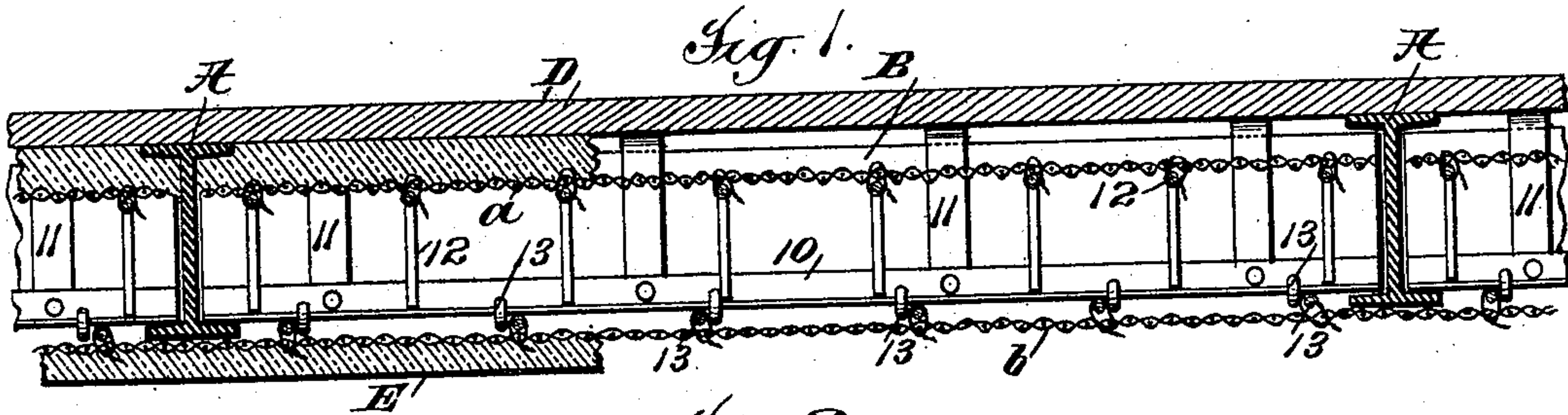


(No Model.)

W. ORR.
FIREPROOF CONSTRUCTION.

No. 582,307.

Patented May 11, 1897.



Attest:
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UNITED STATES PATENT OFFICE.

WILLIAM ORR, OF TRENTON, NEW JERSEY, ASSIGNOR TO THE NEW JERSEY
WIRE CLOTH COMPANY, OF SAME PLACE.

FIREPROOF CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 582,307, dated May 11, 1897.

Application filed December 11, 1895. Serial No. 571,753. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ORR, a citizen of the United States, residing at Trenton, county of Mercer, and State of New Jersey, have invented certain new and useful Improvements in Fireproof Constructions, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 The object of the present invention is to provide an improved fireproof construction adapted especially for use as a combined floor and ceiling construction, although various features of the invention are applicable also in other constructions, the especial object of the invention being to provide a simple, cheap, and efficient construction employing metal joists and metallic lathing to support a floor of concrete or similar plastic material between the beams. I aim particularly at the formation of a construction in which it is necessary only that the floor-beams be stiff enough on their depth to carry the required load, the setting of the concrete or other plastic material in the meshes of the lathing securing an anchorage which prevents thrust against the joists, making it unnecessary to provide the heavy flanges usually used to give the joists side stiffness.

30 As a full understanding of the invention can best be given by an illustration and detailed description of a construction embodying the same, such a description will now be given in connection with the accompanying drawings, showing constructions embodying all the features of the invention in their preferred form, and these features will then be specifically pointed out in the claims.

40 In the drawings, Figure 1 is a section of a combined floor and ceiling construction, the section being taken transversely to the floor-beams and with the concrete broken away through a part of the figure to show the construction. Fig. 2 is a section taken transversely to the plane of Fig. 1 or parallel with the floor-beams. Fig. 3 is a detail view similar to Fig. 2, showing a slightly-modified construction. Fig. 4 is a similar view showing a double-joist construction, which may be found preferable in some cases, and certain

specific features of which form parts of the invention.

Referring now especially to Figs. 1 and 2, A are the floor-beams, and B the floor-joists, extending from beam to beam and formed of metal plates, preferably of substantially the full height of the webs of the beams A, as shown. In the construction illustrated the beams A are of the common I form, and the joists B are supported upon the bottom flanges of the beams. It will be understood, however, that while this construction is preferred the joists B and construction supported thereby may be used with beams of other form.

At the bottom of the joists B are flanges 10, which, as in the construction shown in Figs. 1 and 2, are formed of separate angle-irons extending longitudinally of the joists and supported from the tops of the joists by metal hangers 11, arranged at suitable intervals along the joists and riveted or otherwise suitably secured to the angle-irons. These flanges 10 not only form the supports for the lathing which extends between the floor-joists, as fully described hereinafter, but hold the joists in vertical position upon the flanges of beams A during the formation of the construction.

The metallic lathing, which forms a support and key for the concrete floor, is preferably carried by rods 12, which are sprung into arched form between the joists B with their opposite ends resting in the angles formed by the flanges 10. On top of these rods 12 the lathing, which may be of any suitable form, either woven wire, as shown, or perforated sheet metal, is applied and may be secured by lacing, as shown, or in any other suitable manner, or may be simply sprung into place between the flanges and rest upon the rods 12.

A body of concrete C is applied to the arched lathing *a*, supported on the rods 12, so as to fill all the space between the joists 11 and extend to the tops of the same and of the beams A, the flooring D being applied directly thereon or supported by wooden joists laid on the concrete, as desired.

The construction above described is complete in case a separate ceiling is not to be

made, but one of the objects of the invention is to provide a floor and ceiling construction with air-spaces between the two, and such a construction is illustrated.

5 In Figs. 1 and 2 the flanges 10 support also the ceiling, which is formed of metallic lathing and plastic material, the lathing being supported, preferably, by suitable rods 13, extending longitudinally of and below the joists
10 B and are shown as hooked about the flanges so as to be thus held in position, the metallic lathing *b*, of any suitable form, being secured to and supported by these rods, being shown as woven wire laced to the rods. The ceiling is
15 completed by the body of plastic material E, applied to the lathing *b* upon the supporting-rods 13, so as to cover the bottom of the construction and protect the bottoms of the joists B and beams A.

20 The metal joists B are preferably bent, as shown, so as to form one or more corrugations extending longitudinally of the beams, which are preferably curved, as shown. These corrugations are preferably used, as they provide an anchorage for the concrete C, which
25 is thus supported vertically. It will be understood, however, that the other features of the invention may be employed with straight joists and that this corrugated-plate construction is applicable in other concrete constructions than that shown.

In Fig. 3 some slight modifications of the construction are illustrated, in which the joists B are not corrugated throughout their
35 entire width, but are straight for some distance above their lower edges. This construction will be found quite efficient, as the anchorage of the concrete upon the joists is not so important at the bottoms of the joists,
40 the small portion of concrete on the straight portions of the joists being well supported by the flanges 10 and lathing *a*. The ceiling-supporting rods 13 in this construction also are not supported by the flanges 10, but one
45 end of each of the hangers 11 is shown as extended below the flanges and provided with openings to receive the ends of the rods 13, which may be secured in place under the proper tension by nuts, as shown, or otherwise.

50 In Fig. 4 there is shown a construction similar to those above described, but employing an improved form of metal joist which is made of a plate of metal bent centrally, so as to form a double-plate joist, the two side plates, preferably, being corrugated, as in the constructions
55 shown in Figs. 1 to 3, a very strong and efficient metal construction with a very light joist being thus provided. The flanges 10 in this construction are shown as formed directly upon the joists B, the opposite plates of the double joist being bent outward at the
60 bottom, so as to form these flanges, and the lathing-supporting rods 12 being mounted upon them in the same way as shown in Figs. 1 to 3. In this construction also the ceiling-supporting rods 13 are shown as supported by

hangers 14, which may be pieces of plate metal provided with an enlarged head held between the two plates of the joists B and within the lowest corrugation, so as to project below the
70 joists, where they are perforated to receive the rods 13, which are shown as held in position in the same manner as in Fig. 3. The hangers 14 are supported firmly by the pressing together of the plates of the joists B by
75 the rods 12 on opposite sides sprung into the flanges 10 and by the bodies of concrete C, which when applied press the lower ends of these plates together.

The wooden floor-joists D are shown in Fig. 80 4 as held in place and anchored to the joists B and concrete body C by means of clips 15, which inclose the upper corrugations of the double joists B and are embedded in the concrete, staples 1 or other suitable means being
85 used to secure the clips 15 to the sides of the joists D. This forms a very simple and convenient means for anchoring the floor-joists D to the concrete.

It will be seen that the invention provides 90 a very simple fireproof construction in which all the parts used are of metal, and may be light, cheap, and easily handled in assembling, the special form and arrangement of the construction relieving the thrust and se-
95 curing such a support of the concrete that heavy and strong metal parts are not required.

It will be understood that many modifications may be made in the constructions shown without departing from the invention, and I
100 am not to be limited to the exact form or arrangement of parts illustrated.

What is claimed is—

1. The combination with beams, of joists supported by said beams and extending from
105 beam to beam, metallic lathing supported by said joists and forming a series of arches between the joists, and a filling of concrete or similar plastic material applied to said lathing, substantially as described. 110

2. The combination with beams, of joists supported by said beams and extending from
115 beam to beam, arched rods supported at the bottom of said joists, metallic lathing on said rods forming a series of arches between the joists, and a filling of concrete or similar plastic material applied to said lathing, substantially as described.

3. The combination with beams, of joists supported by said beams and extending from
120 beam to beam, angle-plates at the bottoms of said joists, arched rods supported by said angle-plates, metallic lathing on said rods forming a series of arches between the joists, and a filling of concrete or similar plastic material applied to said lathing, substantially
125 as described.

4. The combination with beams, of metal joists supported by said beams and extending
130 from beam to beam, said joists having corrugations extending longitudinally of the joists, metallic lathing between and supported by

said joists, and a filling of concrete or similar plastic material applied to said lathing, substantially as described.

5 5. The combination with beams, of joists supported by said beams and extending from beam to beam, metallic lathing supported by said joists and forming a series of arches between the joists, a filling of concrete or similar plastic material applied to said lathing, 10 and a ceiling of metallic lathing and plastic material supported by said joists, substantially as described.

6. The combination with beams, of joists supported by said beams and extending from 15 beam to beam, arched rods supported at the bottoms of said joists, metallic lathing on said rods forming a series of arches between the joists, a filling of concrete or similar plastic material applied to said lathing, rods supported by and at the bottoms of said joists 20 and extending transversely to the joists, and a ceiling of lathing and plastic material on said last-mentioned rods, substantially as described.

25 7. The combination with beams, of metal plates supported by said beams and extending from beam to beam, metallic lathing supported by said plates and forming arches between the plates, and a body of concrete or 30 similar plastic material applied to said lathing and in which the plates are embedded, said plates being provided on their vertical faces with corrugations extending longitudinally of the plates and embedded in the concrete or similar plastic material, whereby a 35 vertical support for said material is secured, substantially as described.

8. The combination with beams, of metal plates supported by said beams and extending 40 from beam to beam, and a body of concrete or similar plastic material forming arches between the plates and in which the plates are embedded, said plates being provided on their vertical faces with corrugations extending 45 longitudinally of the plates and embedded in the concrete or similar plastic material, whereby a vertical support for said material is secured, substantially as described.

9. A metal beam or joist for fireproof constructions consisting of a plate bent lengthwise to form a double beam or joist and provided with corrugations extending longitudinally of the plate, substantially as described.

55 10. A metal beam or joist for fireproof constructions consisting of a plate bent lengthwise to form a double beam or joist and provided with corrugations extending longitudi-

nally of the plate and having its bottom edges bent outward to form angle-plates 10, substantially as described. 60

11. The combination with the flanged beams A, of metal joists B resting on the flanges of said beams, angle-plates 10 at the bottom of said joists, arched metallic lathing extending between said plates, and a filling of plastic 65 material, substantially as described.

12. The combination with the flanged beams A, of metal joists B resting on the flanges of said beams, angle-plates 10 at the bottom of said joists, arched rods 12 supported by said 70 plates, and metallic lathing and a filling of plastic material on said rods, substantially as described.

13. The combination with the flanged beams A, of metal joists B resting on the flanges of 75 said beams, angle-plates 10 at the bottom of said joists, arched rods 12 supported by said plates, metallic lathing and a filling of plastic material on said rods, rods 13 below and supported by said joists, and metallic lathing and 80 plastic material on said rods 13, substantially as described.

14. The combination with the flanged beams A, of double metal joists B resting on the flanges of the beams and bent outward at their 85 lower edges to form angle-plates, arched metallic lathing extending between said plates, and a filling of plastic material, substantially as described.

15. The combination with the flanged beams 90 A, of double metal joists B resting on the flanges of the beams and bent outward at their lower edges to form angle-plates, said joists being provided with longitudinal corrugations, arched metallic lathing extending be- 95 tween said plates, and a filling of plastic material, substantially as described.

16. The combination with the flanged beams A, of double metal joists B resting on the flanges of the beams and bent outward at their 100 lower edges to form angle-plates, arched metallic lathing extending between said plates, a filling of plastic material, hangers 14 supported between the plates of said joists, and metallic lathing and plastic material sup- 105 ported by said hangers, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WM. ORR.

Witnesses:

C. J. SAWYER,
A. L. KENT.