(No Model.)

W. ORR.

FIRE PROOF BUILDING.

No. 456,202. Patented July 21, 1891.

Fig. 1.

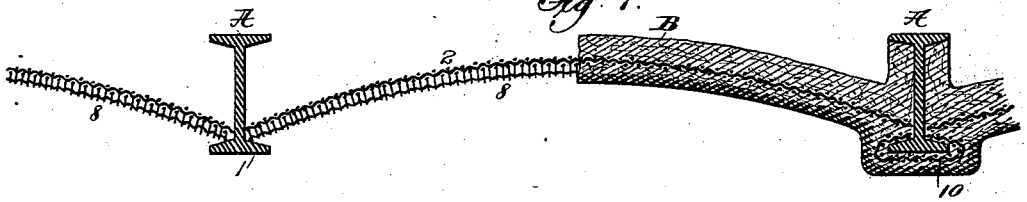


Fig. 2.

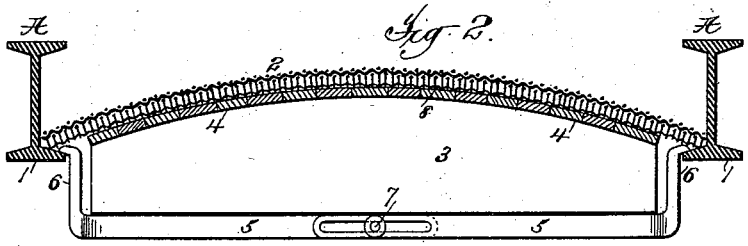


Fig. 3.

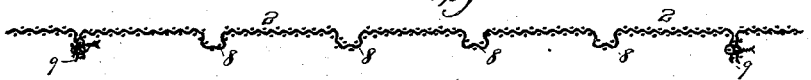


Fig. 4.

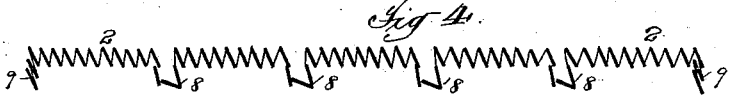


Fig. 5.

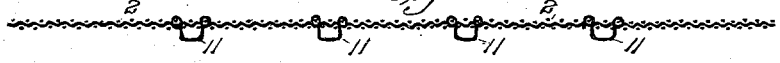


Fig. 6.

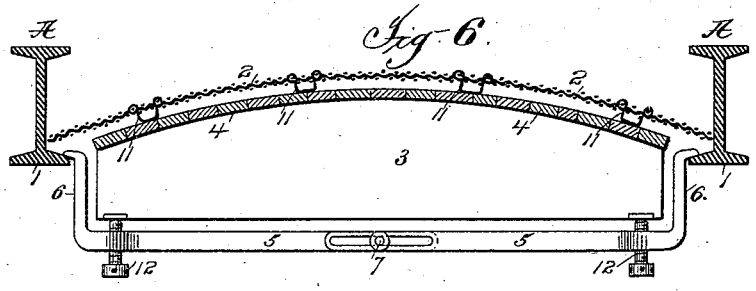


Fig. 7.

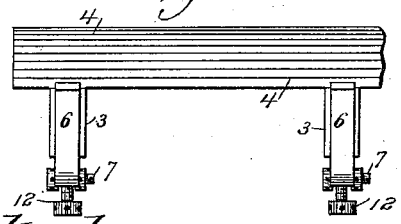
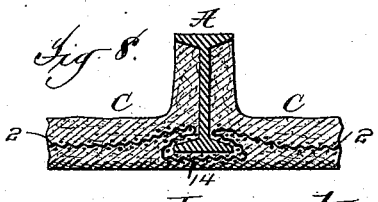


Fig. 8.



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UNITED STATES PATENT OFFICE.

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FIRE-PROOF BUILDING.

SPECIFICATION forming part of Letters Patent No. 456,202, dated July 21, 1891.

Application filed April 30, 1890. Serial No. 350,010. (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 Fire-Proof Buildings, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to the construction of ceilings or walls formed of metallic lathing, to which is applied cement, concrete, plaster, or other suitable plastic material, and especially to arches thus constructed, it being the object of the invention to provide an improved construction by which the cost is reduced and the strength and fire-proof qualities of the ceiling or wall increased.

To this end my invention consists in an improved means for forming fire-proof structures with metallic lathing, and in an improved ceiling and arch construction, all of which will be more particularly described in the specification, and pointed out in the claims.

For a full understanding of my invention a detailed description will now be given, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 shows an arch constructed in accordance with my invention, part of the plastic material being removed. Fig. 2 shows the method of supporting the lathing during the process of constructing the arch. Fig. 3 is a section of the metallic frame of the arch of Figs. 1 and 2, taken across the curve and showing the preferred form of construction. Fig. 4 is a similar section of the same construction with metallic lathing formed of perforated sheet metal. Fig. 5 is a similar section of a modified construction, in which the lathing is provided with offsetting clips. Fig. 6 shows an adjustable frame, preferably used to support the lathing. Fig. 7 is a side view of the frame shown in Fig. 6. Fig. 8 shows a section of straight ceiling constructed in accordance with my invention.

Referring now particularly to Figs. 1 and 2, A are the ordinary I-beams of a ceiling, and B an arch supported thereby, the arch being formed by a section of metallic lathing 2, sprung into position above the lower flanges 1 and embedded in a body of plastic material. For the purpose of supporting this metallic lathing during the process of applying the plastic material I employ a frame formed preferably of side pieces 3 and slats 4 supported thereon and forming the top of the frame. This frame may be supported in any suitable manner by blocking or otherwise; but I prefer to use the means shown, consisting of a light metallic hanger 5, supported from the flanges of the beams by arms 6 and carrying the frame. This hanger is formed preferably in two parts, having a slot and set-screw connection 7, as shown in Fig. 2, by which the two parts of the hanger may be drawn together and the supporting ends released from the flanges of the beams, thus allowing the frame to be removed from beneath the arch.

The supporting-frame may rest directly upon the hanger, as shown in Fig. 2; but I prefer to employ the construction shown in Fig. 6, in which the hanger is provided with set-screws 12 at each end on which the frame is supported and by which it may be adjusted vertically, as desired. With this construction the metallic lathing having been sprung into position between the beams, the frame will be placed in position beneath it and raised by the set-screws 12 until it is in position to support the lathing. The plastic material is then applied and allowed to set as desired, when the frame will be lowered by the set-screws and withdrawn from the plastic material, and the frame and hanger will then be moved forward for the construction of another section, as above described.

The metallic lathing used may be of any suitable construction, either of woven wire or of metal perforated or cut in any of the common forms. For the purpose of offsetting this lathing from the frame I preferably provide the lathing, whether of the woven-wire form shown in Figs. 1, 2, and 3, or of the perforated sheet-metal form shown in Fig. 4, with ribs 8 and flanges 9 extending in the direction of the curve, these ribs and flanges being made to project from the body of the lathing a distance equal to the desired thick-

ness of the plastic material on the under side of the lathing. The lathing thus being offset from the frame the cement, concrete, or other material of which the arch is to be formed will be poured on from above, having been allowed to thicken sufficiently for this purpose. The depth of the coating formed will preferably be greater on the upper side of the lathing than on the lower, thus increasing the pressure on the arch and adding to the tensile strength of the metal a compressive strength produced by the weight of the body of the plastic material upon it; but this is not absolutely necessary. The cement having been allowed to set sufficiently the two parts of the hanger 5 are drawn together, releasing the arms 6 from the flanges of beams A, and the frame is withdrawn from beneath the arch and moved forward for the construction of another section. A coating of plaster or finish of any suitable material is then applied on the under side of the arch.

A section of lathing 10 will preferably be bent around the lower flanges 1 of the beams, as shown in Fig. 1, after the supporting-frame is removed, and covered with the plastic material, thus protecting the flanges of the beams also and increasing the fire-proof qualities of the construction. The plastic material will also preferably be applied to the sides of the beams and the base of the upper flanges, as shown.

It is evident that by the use of my supporting-frame all danger of the arch being thrown out of form by the greater pressure upon some parts produced by unequal distribution of the cement during the process of construction is avoided. By offsetting the lathing from the frame and applying the cement from above I provide a simple and convenient means of constructing a ceiling or arch in which the metallic frame formed by the lathing is entirely embedded in a body of plastic material, the lathing forming a series of angles preventing any slipping between it and the plastic material, and the union of the two making an exceedingly strong ceiling and an arch that will stand any required test.

The downturned ribs and flanges of the lathing are an important feature of my invention as applied to arch construction, independent of their use as a means for offsetting the lathing from the supporting-frame. By the use of these ribs and flanges running in the direction of the curve the compressive strength of the metallic frame is greatly increased. So great is the advantage obtained by this that it will frequently be found not necessary to use the supporting-frame with lathing so constructed, the ribs and flanges adding sufficient strength to the lathing to support it during the process of applying the cement, so as to prevent the arch being thrown out of form. In case the frame be not employed the ribs and flanges may be upon the upper or under side of the lathing and the cement applied from above or below, as preferred. For increasing the strength of the lathing the flanges may be secured together in any suitable manner, as by clips or lacing, as shown in Fig. 3.

While I prefer to use the ribs and flanges, as shown in Figs. 1 to 4, on account of the greater strength of the arch secured thereby, as above described, it is evident that the lathing may be offset from the frame by other means, and that this offsetting is independent of any strengthening feature added to the lathing itself. Thus I have shown in Fig. 5 a section of woven-wire lathing in which clips 11 are used to offset the lathing from the supporting-frame. The same result may be secured in many different ways, as by down-turned edges of perforated sheet metal or depressions in the metal. This method of supporting the lathing while the concrete is being applied may be applied not only to an arch, for which it is especially desirable, but also to a straight ceiling, in which case the arms 6 of the hangers will be extended and the upper surface of the supporting-frame be a plane. A section of a ceiling C thus formed is shown in Fig. 8, in which the sheet of lathing is shown also as bent around the lower flanges of the beams at 14, so as to cover and protect them and avoid the use of the independent sheet of lathing for this purpose. This method of covering the flanges of the beams may be applied also to the arch construction of Fig. 1.

What I claim is—

1. A fire-proof ceiling consisting of metallic lathing extending from beam to beam and having upon its under side offsetting portions projecting from its body, and a body of plastic material applied from above and in which the body of the lathing and projections are embedded, substantially as described.

2. An arch formed of metallic lathing bent to the required form and having upon its under side offsetting portions projecting from its body, and a body of plastic material applied from above and in which the body of the lathing and projections are embedded, substantially as described.

3. An arch formed of metallic lathing bent to the required form and having upon its under side ribs or flanges extending in the line of the curve, and a body of plastic material applied from above and in which the body of the lathing and the ribs or flanges are embedded, substantially as described.

4. The combination, with the beams A, of a hanger 5, adjustable in length transversely to the beams and provided with arms 6, adapted to be hooked over the flanges of the beams, and a lathing-supporting frame carried by said hanger, substantially as described.

5. The combination, with the beams A, of a hanger 5, adjustable in length transversely to the beams and provided with arms 6, adapted to be hooked over the flanges of the beams, and a lathing-supporting frame carried by

said hanger and vertically adjustable thereon, substantially as described.

6. The combination, with the beams A, of the two-part hanger 5, provided with arms 6, adapted to be hooked over the flanges of the beams, set-screws 12, carried by said hanger, and a lathing-supporting frame vertically adjustable by said set-screws, substantially as described.

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

WILLIAM ORR.

Witnesses:
A. D. CARNAGY,
H. N. CORNING.