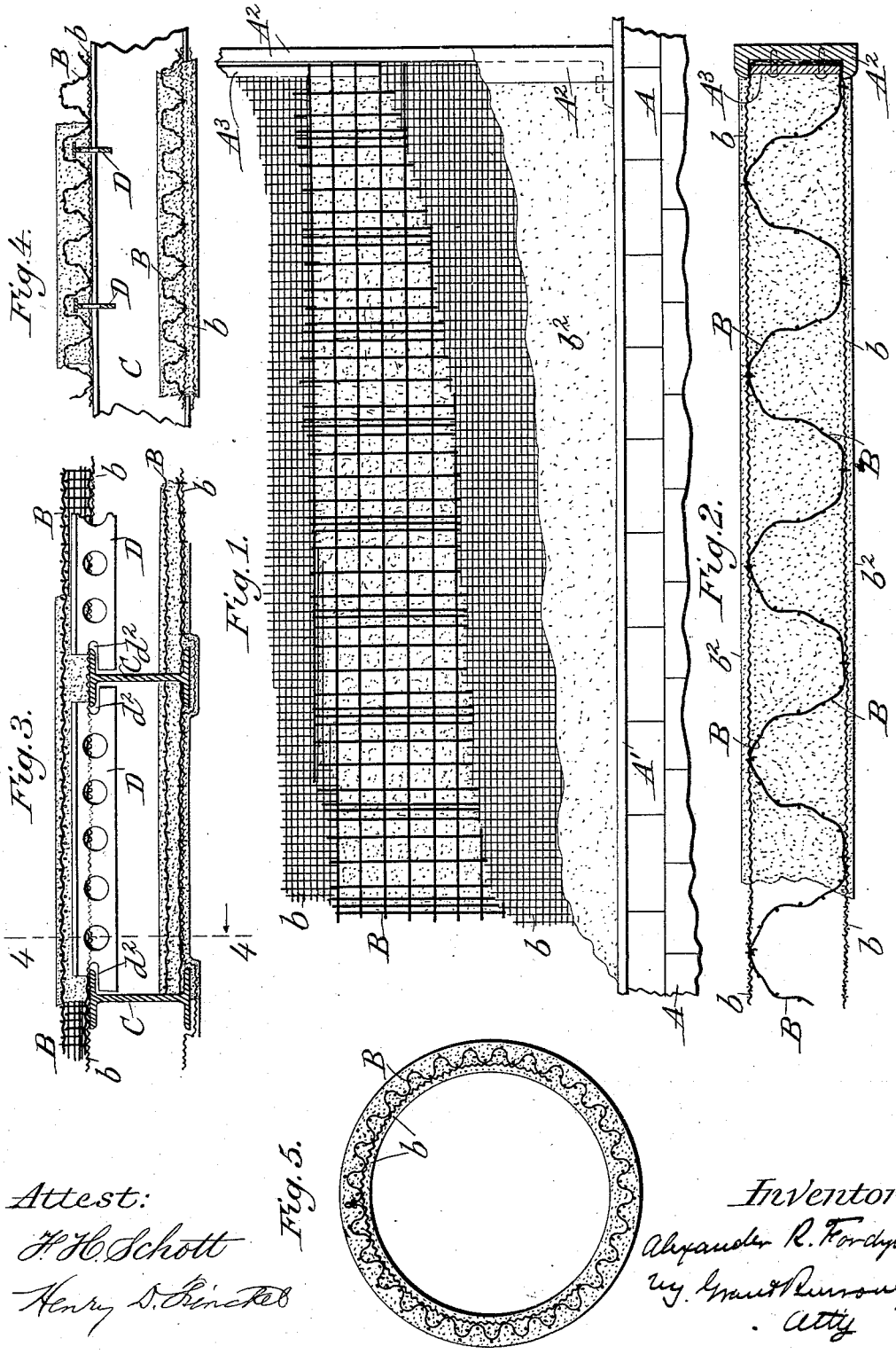
(No Model.) 2 Sheets—Sheet 1.

A. R. FORDYCE.

FIREPROOF BUILDING CONSTRUCTION.

No. 553,305. Patented Jan. 21, 1896.



Attest:
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Atty

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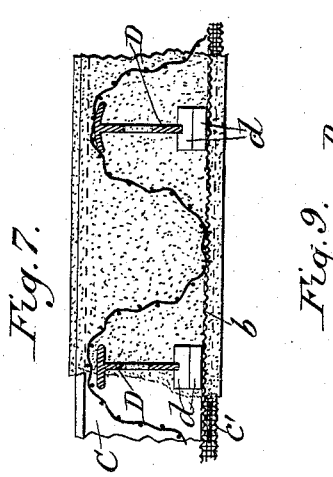

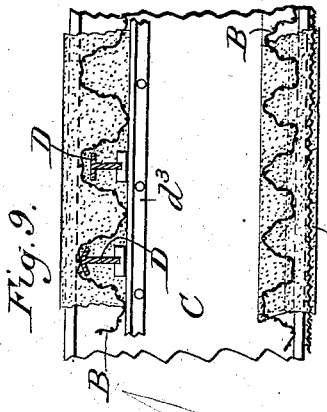

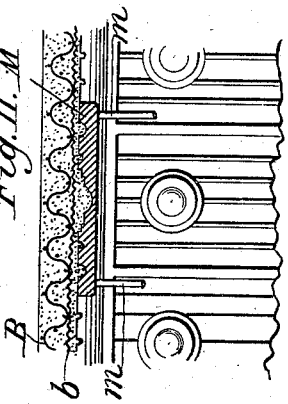

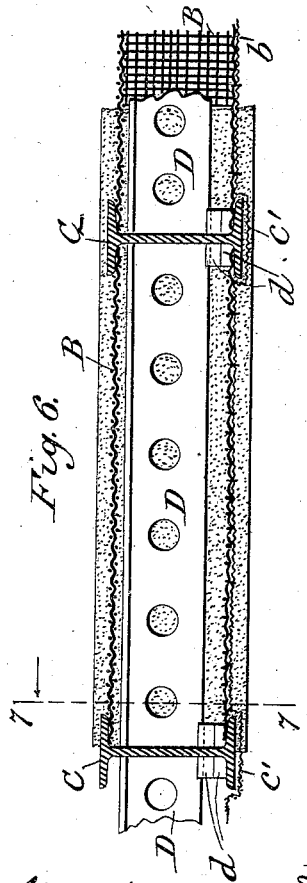

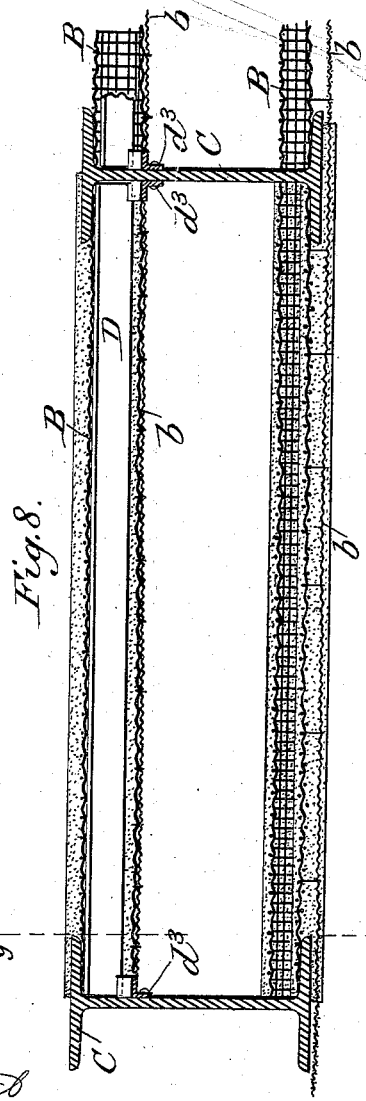

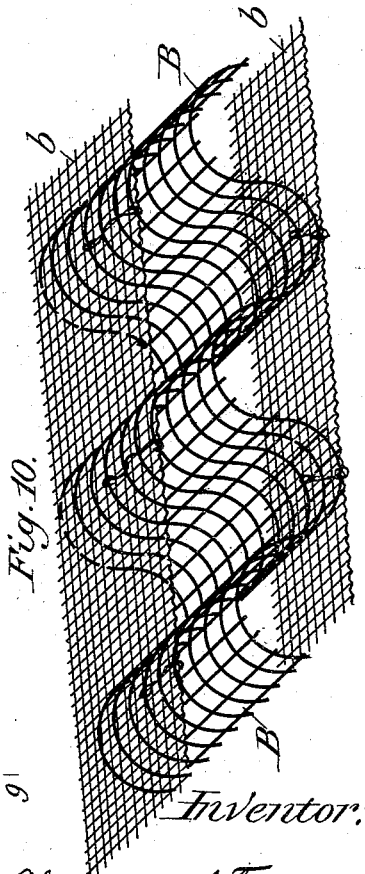

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UNITED STATES PATENT OFFICE.

ALEXANDER R. FORDYCE, OF NEWARK, NEW JERSEY.

FIREPROOF-BUILDING CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 553,305, dated January 21, 1896.

Application filed October 8, 1895. Serial No. 565,031. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER R. FORDYCE, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Fireproof Buildings, of which the following is a full, clear, and exact description, such as will enable those skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings.

This invention relates to improvements in the construction of fireproof walls, ceilings, &c., of that class which are formed of a plastic filling or body, such as cement, plaster, concrete, &c., bonded by a metallic skeleton.

The invention relates more particularly to the construction of the metallic skeleton which will, when embedded in the plastic material, securely hold the latter in position when it is in a green state, and which will, after the material has set, securely bond or tie the same.

It also has for its object the provision of a metallic skeleton whereby a wall or ceiling can be completed as it is built section by section without the application of plaster other than that used in forming the walls and ceilings themselves.

It further has for its object a process for the construction of finished or ornamental walls and ceilings.

The invention consists in the novel construction, combination, and arrangement of parts, such as will be hereinafter fully described, pointed out in the appended claims, and illustrated in the accompanying drawings.

In the accompanying drawings, in which similar letters of reference designate corresponding parts, Figure 1 is an elevation, partly in section, showing a section of a wall embodying the invention. Fig. 2 is a horizontal sectional view of the same. Fig. 3 is a vertical sectional view, showing a section of a floor and the ceiling directly beneath the same, the flooring supported upon the tops of the beams and the ceiling on the lower flanges of the beams, and also the auxiliary supporting-beams for the floor skeleton. Fig. 4 is a sectional view on the line 4 4 of Fig. 3. Fig. 5 is a sectional view showing a curved wall, such as is used in sewer construction, embodying the invention. Fig. 6 is a vertical sectional view showing the flooring supported beneath the upper flanges of the beams and a differently-constructed auxiliary beam. Fig. 7 is a sectional view on the line 7 7 of Fig. 6. Fig. 8 is a sectional view showing the invention applied to a floor and a ceiling supported by beams of considerable depth. Fig. 9 is a sectional view on the line 9 9 of Fig. 8. Fig. 10 is a detail perspective showing a portion of the metallic skeleton. Fig. 11 is a detail sectional view illustrating the use of a mold in the formation of ornamental ceilings.

Referring to the drawings by letter, more particularly to Figs. 1 and 2, A designates a foundation of any construction suitable in the premises, in which is embedded the iron sill A'. To the end of this sill is fastened the upright A^2 in a suitable manner. Similar uprights may be placed at suitable intervals along the sill. These intervals may be comparatively long, as the wall, when once set, is self-supporting. Between these uprights the metallic skeleton is placed. It consists of the corrugated wire fabric B, the corrugations of which may be of any shape, but preferably segments of circles. These corrugations have a depth little less than the thickness of the solid part of the proposed wall. To the opposite sides of this corrugated fabric are attached sections *b b* of plane wire fabric. The free ends of the fabrics are secured by being clamped between the upright A^2 and the plates A^3 A^3.

In the construction of a wall a section of the skeleton is placed horizontally between the uprights, with the ribs of the corrugations vertical, and is secured in place in the manner hereinbefore described. After a section has been placed in position the filling of plaster, which has been mixed to the proper consistency, is introduced into the open upper end of the skeleton, from which it will have an easy access to all parts of the skeleton, between the outer fabrics of the same.

It is to be observed that the meshes of the corrugated portion of the skeleton are much coarser than those of the sides. The object of this is to facilitate the spreading of the plaster and to insure a uniform settling of

the same. The comparatively finer meshes of the side pieces b b will retain the bulk of the plaster. A small portion of the plaster will, however, pass through the meshes of the sides, which can be smoothed to form the surfaces b^2 b^2 of the wall. In this way a wall—say a partition having a thickness of a few inches—can be easily and quickly constructed, and which at the same time will have the necessary strength, will be sound and fireproof to a high degree. It is to be observed also that the metallic skeleton occupies but very little room in the body of the plaster, so that the latter is practically solid. At the same time the skeleton serves to strongly bond and tie the mass.

In the modifications shown in Fig. 5 a curved wall is shown, such as is adapted to be used in sewer construction. In this instance but one side piece of retaining fabric is used. This is on the inner side of the corrugated fabric and extends but two-thirds of the circumference. In constructions of this character the skeleton is bent and placed in position, that portion not provided with a retaining side resting on the ground. The filling is then introduced from the outside—that is, into the upper portion. That portion which contacts with the ground and which is not provided with a retaining side piece is filled from the interior.

It is to be observed that in all these different applications of the skeleton the filling completely covers the wires, so as to prevent corrosion.

The drawings 3, 4, 6, 7, 8 and 9 show the application of the device in the construction of floors and ceilings. Figs. 6 and 7 show the application where the floor and ceiling are integral. The other figures show the application where the floor and ceiling are separated by an air-space.

Referring to Figs. 6 and 7, C C designate I-beams which are adapted to support a floor and a ceiling made integral—say three inches thick. In this construction a section of the skeleton, consisting of the corrugated portion B and the side piece b secured thereto, is placed between the beams to rest upon the lower flanges of the same. The filling is then put in from above. It passes readily through the coarser meshes of the corrugated part and is caught by the side piece b, the finer mesh of the latter allowing but a small quantity of the plaster to pass through, which is desirable, as it can be smoothed to form the surface of the ceiling. This obviates the application of a finishing coat from beneath. In this way a ceiling can be completely constructed from above, thereby doing away with the use of scaffolding, which is very costly and also dangerous, especially in buildings with extremely high ceilings; and, furthermore, as the filling is done from above, the finished article will be much less liable to displacement, for it is obvious that if the filling would not fall when in a semi-liquid condition its chances for doing so when it has hardened would be extremely remote. The space between the beams C C is filled in until the skeleton has been completely covered and it has reached a height sufficient to form the floor-surface above.

As mortar will not adhere to a plane iron surface very well, a piece of wire fabric c' is attached to the under side of the beam C.

It is to be observed that the skeleton is so placed that the corrugations extend from beam to beam so as to form ribs. In ordinary floor and ceiling construction the skeleton together with the hardened filling will give sufficient strength. Where extraordinary strength is required additional strength may be secured by means of the auxiliary beams D D. These beams are of comparatively light construction and extend through the arches formed by the corrugations of the skeleton and rest at their ends on the flanges of the beams C C, and when necessary can be raised above the flanges so as to contact with the upper turn of the arches containing them by means of the blocks d d. These beams can be perforated to give a free passage of the filling and so as not to injure the bond of the latter.

In some instances, where the supporting-beams are of considerable depth, it would be desirable to have the floor and ceiling separated by an air-space. Such constructions are shown in Figs. 3, 4, 8, and 9. In Figs. 3 and 4 the floor is shown resting upon the tops of the beams. In this instance the auxiliary beams are held in place by having their ends slotted, as at d^2 d^2, and registered with the flanges of the beams C C. In the construction shown in Figs. 8 and 9 the flooring is shown substantially flush with the tops of the beams C C. In this case the auxiliary beams are supported at their ends by the angle-irons d^3 d^3, fixed to the sides of the beams C C. In constructions of these sorts the skeleton forming the foundation for the ceiling is first placed in position on the lower flanges of the beams C C. Then filling sufficient to cover the skeleton is deposited between the beams and manipulated in the manner hereinbefore described.

In Figs. 8 and 9 the wire fabric forming the under side of the skeleton is attached in a somewhat different manner. Here it is suspended a short distance below the corrugated portion, so that it will pass the under face of the beams C C.

It is obvious that the invention can be applied in ways different from those herein described without departing from the spirit of the same. For instance, the plane and corrugated wire fabrics may be replaced by plane and corrugated reticulated metallic plates.

The invention is particularly adapted to the construction of ornamental ceilings and walls. As the plaster is introduced so as to pass through the side fabrics of the skeleton to form the finished surface, a mold can be

supported the proper distance from the side fabric to receive the plaster. The plaster, after the mold is in place, is introduced back of, or above in the case of ceilings, into the skeleton. It will pass through the meshes of the fabrics and fill the mold. After the plaster has set, the mold can be moved to another position and the process repeated.

The mold may be a board faced with any material that will prevent the adherence of the plaster. Such a mold will leave a plane surface, which will need but very little additional dressing.

It is obvious that the mold may have any pattern suitable in the premises. In Fig. 11 a completed section of a wall is shown and another section is shown in the process of construction. In this figure M designates the mold which is supported by rods *m m*, which may be adjustably mounted on a suitable carriage.

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

1. In a metallic skeleton, the combination of the corrugated wire fabric and the plane wire fabric attached thereto, substantially as described.

2. In a metallic skeleton, the combination of the corrugated wire fabric and the plane wire fabric attached thereto, the dimensions of the meshes of the corrugated part differing from those of the plane fabric, substantially as described.

3. In a metallic skeleton, the combination of the corrugated wire fabric and the plane wire fabrics attached to opposite sides thereof, substantially as described.

4. In a fire proof building, the combination of the beams, and the metallic skeleton supported thereby, the said skeleton consisting of the corrugated wire fabric and the plane fabric attached to a side thereof, the skeleton mounted on the beams with its ribs, formed by the corrugations, extending from beam to beam, substantially as described.

5. In a fire proof building, the combination of the beams, the metallic skeleton supported thereby and consisting of the corrugated wire fabric and the plane fabric attached to the side thereof, the skeleton mounted on the beams with the ribs, formed by the corrugations, extending from beam to beam, and the auxiliary beams, substantially as described.

6. In a metallic skeleton, the combination of the corrugated wire fabric and the plane wire fabric attached thereto, the former having meshes coarser than those of the latter, substantially as described.

7. In a fire proof construction, the combination of the metallic skeleton consisting of a corrugated wire fabric and the plane fabric attached thereto, and the support contained within a convolution of the said skeleton, substantially as described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ALEXANDER R. FORDYCE.

Witnesses:
GRANT BURROUGHS,
DAVID E. MOORE.