No. 758,577. PATENTED APR. 26, 1904.

W. N. WIGHT.

FLOOR OR CEILING.

APPLICATION FILED MAR. 13, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

FIG. 1.

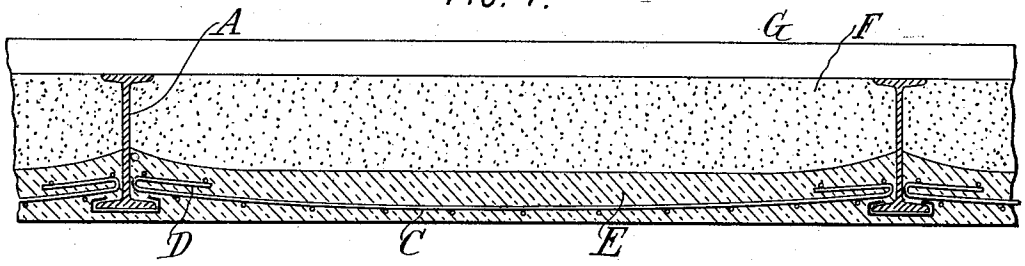


FIG. 2.

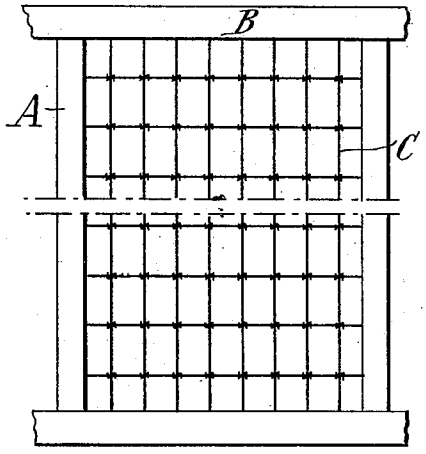


FIG. 3.

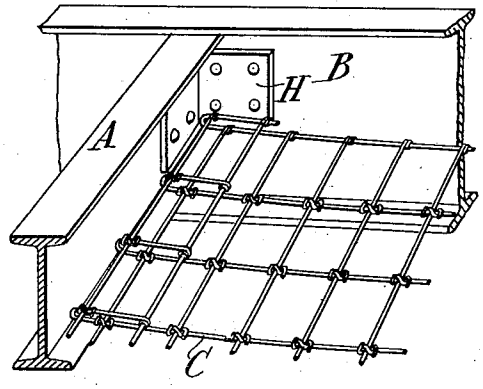


FIG. 4.

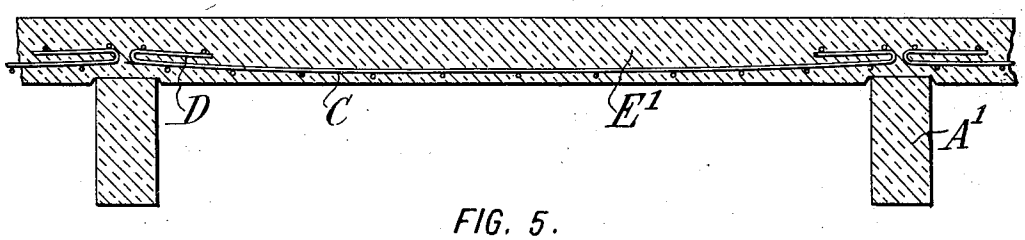
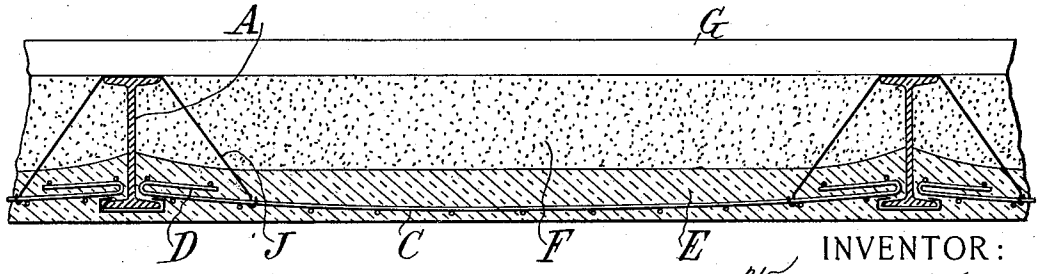


FIG. 5.



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NO MODEL. 2 SHEETS—SHEET 2.

FIG. 6.

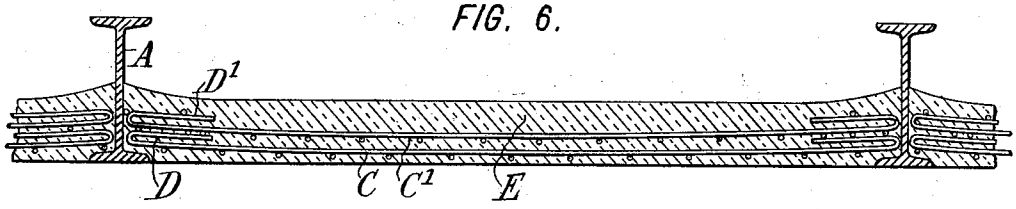


FIG. 7.

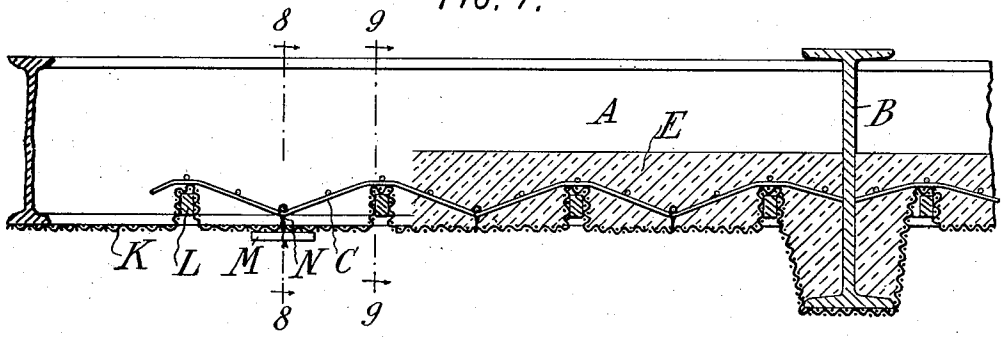


FIG. 8.

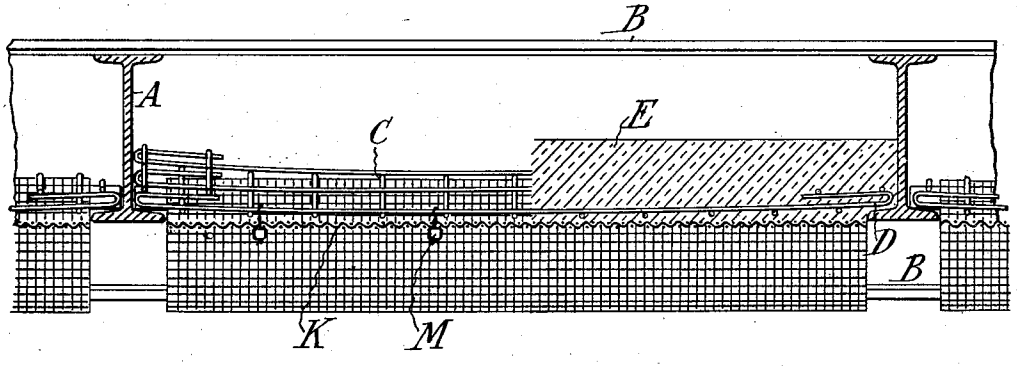
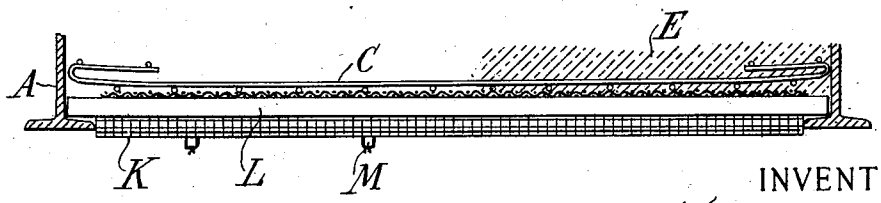


FIG. 9.



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No. 758,577. Patented April 26, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM N. WIGHT, OF NEW YORK, N. Y.

FLOOR OR CEILING.

SPECIFICATION forming part of Letters Patent No. 758,577, dated April 26, 1904

Application filed March 13, 1903. Serial No. 147,693. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM N. WIGHT, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Floors or Ceilings, of which the following is a specification.

My invention aims to provide a floor of concrete and metal which is reinforced at the points of greatest strain.

My invention aims also to provide a floor which can be built in large areas very rapidly and in substantially one continuous structure.

My invention provides also certain other advantageous features referred to in detail hereinafter.

The accompanying drawings illustrate structures embodying my invention.

Figure 1 is a section of a complete floor transverse to the I-beams which form the usual supports. Fig. 2 is a plan of a complete bay between two girders and two beams supported thereon. Fig. 3 is a perspective view of a corner of a bay. Figs. 4, 5, and 6 are sections similar to Fig. 1, showing other embodiments of the invention. Fig. 7 is a section parallel to the I-beams and transverse to the girders, showing a construction including a permanent centering, the concrete being omitted from a portion of the figure. Fig. 8 is a section on the line 8 8 of Fig. 7, likewise showing the concrete in place in one half of the figure and omitting it from the other half. Fig. 9 is a partial section on the line 9 9, Fig. 7.

According to one feature of my invention concrete forming the usual floor or ceiling plate is extended between the supports and a reinforcing metal fabric is embedded therein, and such fabric is reinforced at its edges. It is along the edges of the fabric adjacent to the supports that the greatest shearing strain comes, and as the resistance of concrete against shearing is not very great and a wire fabric which is of quite sufficient cross-section for resisting tensile strains is less efficient for resisting shearing strains the reinforcement at the point stated provides a more uniform relation between the strains put upon the structure at different points and the internal resistance to such strains. The reinforced edges of the fabric are preferably formed by bending back its edges, the original width of the fabric being of course sufficiently greater than the span between the supports to permit of bending back a sufficient portion.

According to another feature of the invention which may be advantageously combined with that above described I form the metal fabric in a comparatively long sheet of approximately the width of the bay between the supports, a single sheet being preferably sufficient to extend the entire length of the supports. The fabric is then laid lengthwise between the supports with the greatest rapidity and a large area of concrete flooring may be built quickly and in substantially one continuous structure. The bending back of one or both edges of the sheet provides also a quick and easy way of fitting the sheet to the width of the bay, especially when the fabric is to rest on the lower flanges of the usual I-beams.

Referring to the embodiments illustrated, the I-beams, which extend between walls or deeper girders and which with said walls or girders inclose the usual "bay," are shown at A, supported at their ends upon girders B. The fabric C may be any one of the numerous fabrics known. I prefer, however, to use the wire fabric described in my application for patent, Serial No. 114,868, filed July 9, 1902, and which may be described briefly as consisting of straight wires in one direction and cross-wires spacing said straight wires and bound thereto at their crossing-points. I prefer to have the straight wires running transversely to the beams A to better resist the tensile strains acting in this direction; but the fabric may be formed with the straight wires running in either direction. In the form of the invention shown in Fig. 1 this fabric rests at its edges upon the lower flanges of the I-beams A and is bent up and back at its edges, as shown, to provide an additional reinforce D. The portion D should be spaced a slight distance away from the main portion of the fabric. I thus obtain a double embedment of the wire in the concrete without weakening the latter. The ceiling-plate E is then molded of concrete in the usual manner of any suitable depth. In connection with this ceil-

ing-plate any style of floor-plate or other floor construction may be used. For example, I have shown the remaining space between the beams filled up with light material, such as cinders F, and the usual floor-sleepers G above this.

Fig. 2 shows the fabric C extending in a single sheet from one to the other of the girders B, the fabric resting on the lower flanges of the beams A, as illustrated in detail in Fig. 3. The end of the fabric adjacent to the girder B may be made in any suitable shape or reinforced or supported in any desired manner. Likewise the ends of the beams A may be supported from the girders in any suitable manner—as, for example, by means of the angle-iron H.

As stated, the invention is capable of a variety of applications. For example, it may be applied in a floor-plate supported upon the tops of any suitable supports, such as the concrete beams A′. (Shown in Fig. 4.) The concrete plate E′ in this case forms the floor-plate. If desired, any suitable style of ceiling-plate may be built in connection therewith. The construction may be further strengthened by supporting the fabric resting on the lower flanges of the I-beams, as in Fig. 1, by additional supports from the tops of such beams. For example, as indicated in Fig. 5, wire-stays J may extend over the tops of the beams A and be attached at their ends to the fabrics C, preferably a slight distance beyond the edge of the reinforcing portion D. Any suitable floor may be used with this construction—such, for example, as a filling of cinders F and wooden sleepers G.

The concrete may be reinforced throughout by two sheets of fabric, either or both of which is doubled at its edges. Such a construction is shown in Fig. 6, in which two substantially identical sheets C and C′ are arranged one above the other, so as to leave a sufficient strength of concrete between them, and the wires of one being staggered relatively to those of the other, so as to avoid creating vertical cleavage planes and so as to get the effect of a fabric with meshes of only one-fourth the size of those in a single sheet of fabric without increasing the closeness of the wires in the plane of the fabric. The fabric C′ may rest directly upon the bent-back edge portion D of the fabric C and may be itself provided with a similar bent-back portion D′, as shown.

According to another feature of my invention I provide an additional structure in the nature of a centering for supporting the concrete during the setting of the same, but which centering is permaneent. Such a construction is especially advantageous in cold weather or other conditions where the concrete sets very slowly and where it is desired to build the partitions of a building at once. In ordinary wooden centering below the floor has to be removed to permit the building of partitions, and the delay caused by waiting for the cement of the floors to set is sometimes a matter of great annoyance and expense. By the provision of a permanent centering not only is this delay and annoyance avoided, the floors being immediately ready for the partitions, but also the concrete and the reinforcing metal embedded therein have their weight supported and are not subjected to any strain until the floors are actually put in use, which is always a considerable time after the building of them. This delay gives the concrete time to set firmly and adhere most strongly to the embedded reinforce and avoids any possible weakness of such adhesion which might be caused by the strain due to the weight of the structure while the concrete is green. The centering may be supported in a variety of ways. I prefer to support it to some extent at least from the reinforced wire fabric, so as to have the latter drawn taut at the time that the concrete is put in place. Figs. 7, 8, and 9 illustrate a construction employing such a centering. The centering shown is formed of wire-cloth K of sufficiently fine mesh to prevent the concrete passing through, this wire-cloth being preferably of a width to span the distance between the lower flanges of the I-beams, as indicated in Fig. 8, and arranged for the most part at the level of the bottom of the I-beams, so as to support the concrete with its lower face in this plane. At suitable intervals the wire-cloth K is supported by extending upward and over transverse supporting-bars L, which may be carried in any suitable manner from the I-beams—as, for example, by merely resting their ends on the lower flanges, Fig. 9. The wire-cloth preferably extends downward and around the bottom of the girders B, as illustrated. The centering being in place a reinforcing fabric—such, for example, as the wire fabric C—is laid across the bars L. In order to support the wire-cloth at points between the bars L and in order at the same time to have the fabric C taut and to bring it down as near the base of the concrete as possible, rods M of suitable length are held up against the bottom of the wire-cloth by means of ties, such as the twisted-wire ties N, passing through the wire-cloth and attached at their upper ends to the reinforcing fabric C at a point intermediate between the bars L. The wires N may be twisted to pull the fabric C quite taut and at the same time to hold up the wire-cloth K. The concrete may be then laid in place and the rods M removed, and the ceiling is ready at once for the application of the partitions beneath. The tie N may still connect the reinforcing fabric C and the centering fabric K, though after the concrete is in place this tie has fulfilled its principal function. The reinforcing wire fabric

may be bent back or otherwise doubled or reinforced at its edges, as indicated at D, Fig. 8. The construction described is obviously well adapted for use in connection with various other arrangements of the reinforcing fabrics than with the specific arrangement shown; but it is specially adapted for this arrangement, because when the centering is formed the bay is entirely open at the top, so as to permit the laying of the reinforcing fabric in long continuous sheets of the full width of the bay. The cost of the centering is not great and will often be found much less than the loss due to delaying the partitions by the use of temporary wooden centering. To some extent also the centering fabric and the transverse bars L reinforce the concrete, the former being in the most advantageous position—that is to say, at the level of the bottom of the concrete.

Though I have described with great particularity of detail certain embodiments of my invention, yet it is to be understood that the invention is not limited to the specific embodiments illustrated. Various modifications thereof in detail and in the arrangement and combination of the parts may be made by those skilled in the art without departure from the invention.

What I claim is—

1. A floor or ceiling comprising in combination supports, concrete extending between said supports, and a metal fabric embedded therein and reinforced at its edges adjacent to and a sufficient distance inward from the edges of said supports to effectively resist shearing strains at and adjacent to such edges.

2. A floor or ceiling comprising in combination supports, concrete extending between said supports, and a metal fabric embedded therein and bent upwardly and back at an edge adjacent to one of said supports to provide a double reinforce to effectively resist shearing strains at such edge.

3. A floor or ceiling comprising in combination supports, concrete extending between said supports, and a metal fabric embedded therein and reinforced at its edges adjacent to said supports to effectively resist shearing strains at such edges, said fabric being in a single sheet extending the entire length of said supports.

4. A floor or ceiling comprising in combination supports, concrete extending between said supports, and a metal fabric embedded therein, said fabric being in a single sheet extending the entire length of said supports and being bent back at an edge adjacent to one of said supports to effectively resist shearing strains at such edge and to fit exactly the width of said bay.

5. A floor or ceiling comprising in combination, a pair of I-beams forming a comparatively long and narrow bay between them, concrete extending between said beams, and a metal reinforce embedded therein consisting of a fabric formed in a comparatively long sheet of approximately the width of said bay so as to permit the ready setting in place of a large area of fabric and to form a large area of flooring in substantially one continuous structure, said sheet resting on the lower flanges of said beams and being bent back horizontally at an edge adjacent to one of said flanges to effectively resist shearing strains at such edge and to fit exactly the width of said bay.

6. A floor or ceiling comprising in combination, a pair of supports forming a comparatively long and narrow bay between them, concrete extending between said supports, and a metal reinforce embedded therein consisting of a fabric formed in a comparatively long sheet of approximately the width of said bay so as to permit the ready setting in place of a large area of fabric and to form a large area of flooring in substantially one continuous structure, and said sheet of fabric being reinforced at its edges adjacent to said supports to effectively resist shearing strains at such edges.

7. A floor or ceiling comprising in combination I-beams, concrete extending between said beams, and a metal fabric resting on the lower flanges of said beams and embedded in said concrete, said fabric being bent upward and backward at an edge adjacent to one of said beams to effectively resist shearing strains at such edge.

8. A floor or ceiling comprising in combination I-beams, concrete extending between said beams, a metal fabric resting on the lower flanges of said beams and embedded in said concrete, said fabric being reinforced at its edges adjacent to said beams to effectively resist shearing strains at such edges, and means for supporting said fabric from the tops of said beams.

9. A floor or ceiling comprising in combination I-beams, concrete extending between said beams, a metal fabric resting on the lower flanges of said beams and embedded in said concrete, said fabric being reinforced at its edges adjacent to said beams to effectively resist shearing strains at such edges, and stays extending over the tops of said beams and attached to the fabrics at each side of said beams.

10. A floor or ceiling comprising in combination supports, concrete extending between said supports, and sheets of metal fabric separated from each other vertically and embedded in said concrete and having their meshes staggered relatively to each other, at least one of said sheets being reinforced at its edges adjacent to said supports to effectively resist shearing strains at such edges.

11. A floor or ceiling comprising in combination floor-supports, a permanent centering, concrete extending between said floor-sup-

ports and resting on said centering, and a reinforce embedded in said concrete.

12. A floor or ceiling comprising in combination floor-supports, a permanent centering of fine-mesh fabric, concrete extending between said floor-supports and resting on said centering, and a reinforce embedded in said concrete.

13. A floor or ceiling comprising in combination I-beams, a permanent centering supported from the lower flanges of said I-beams, concrete extending between said floor-supports and resting on said centering, and a reinforce embedded in said concrete and consisting of a fabric formed in a comparatively long sheet of approximately the width of the bay between said I-beams so as to permit the ready setting in place of a large area of fabric and to form a large area of flooring in substantially one continuous structure.

14. A floor or ceiling comprising in combination floor-supports, a permanent centering, concrete extending between said floor-supports and resting on said centering, transverse bars extending between said supports, and a reinforcing fabric embedded in said concrete resting on said transverse bars and drawn down taut between said transverse bars.

15. A floor or ceiling comprising in combination floor-supports, a permanent centering, a reinforcing fabric supported above said centering, and connected thereto so as to draw said fabric down taut and to sustain said centering, and concrete extending between said floor-supports, resting on said centering and embedding said reinforcing fabric.

16. In combination with a floor or ceiling, a centering comprising supporting-bars, a flexible floor-supporting portion resting directly on and supported by said bars, and additional means between said bars for supporting said flexible portion intermediate the bars.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM N. WIGHT.

Witnesses:
DOMINGO A. USINA,
FRED WHITE.