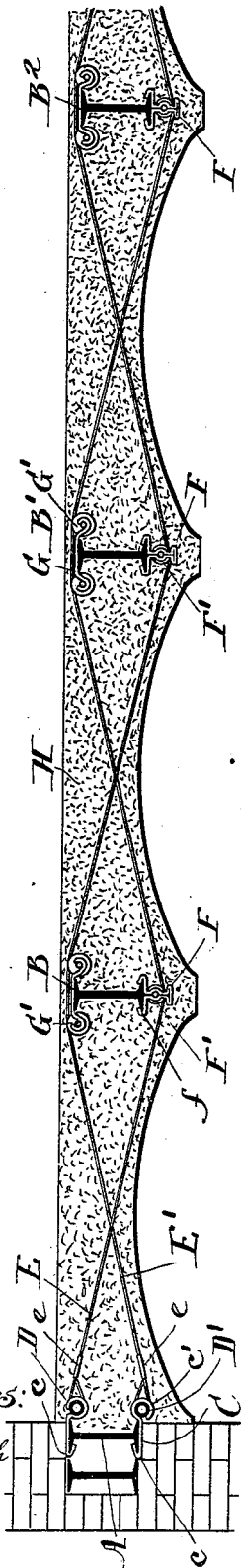
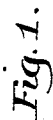


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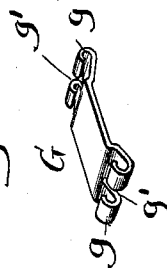
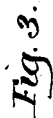
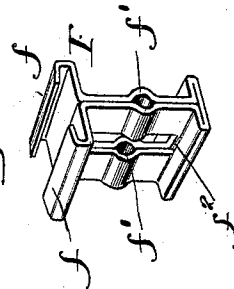
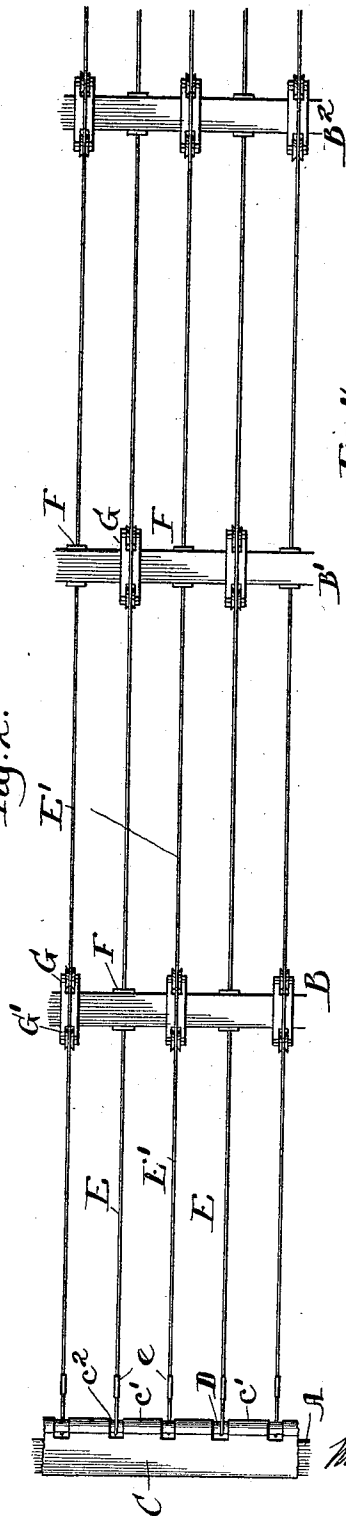
No. 520,492.

Patented May 29, 1894.



Witnesses:

Fred Berloch
J. Adamick.



Inventor:
Mitchell J. M. Cushing
By Amos T. Fisher
Attorneys.

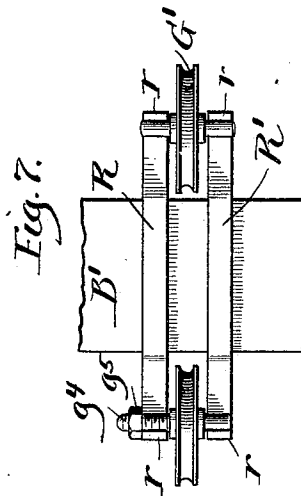
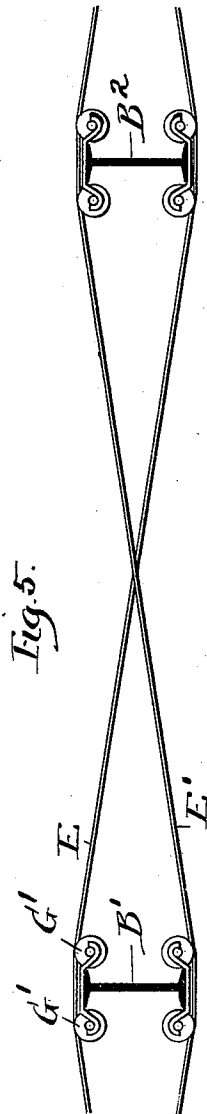
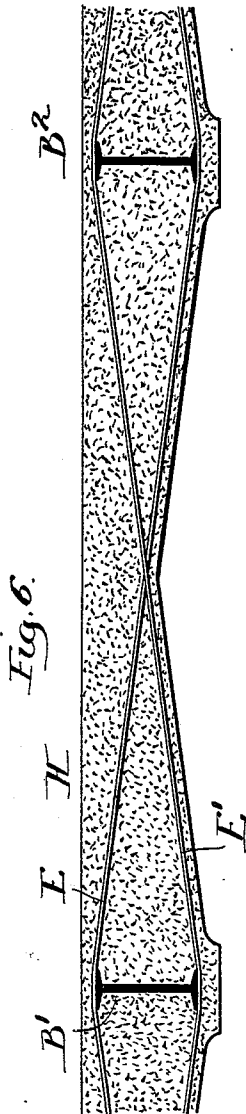
(No Model.)

2 Sheets—Sheet 2.

M. F. McCARTHY.
FIREPROOF FLOOR, CEILING, &c.

No. 520,492.

Patented May 29, 1894.



Witnesses:
Fred Gerlach
A. Adamick.

Inventor:
Mitchell F. McCarthy
By *Price Fisher*
Attorneys.

UNITED STATES PATENT OFFICE.

MITCHELL F. MCCARTHY, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE SUSPENSION ARCH FIRE PROOFING COMPANY, OF ILLINOIS.

FIREPROOF FLOOR, CEILING, &c.

SPECIFICATION forming part of Letters Patent No. 520,492, dated May 29, 1894.

Application filed May 23, 1893. Serial No. 475,275. (No model.)

To all whom it may concern:

Be it known that I, MITCHELL F. MCCARTHY, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Fireproof Floors, Ceilings, and the Like Structures, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The present invention has relation to that class of fire proof structures in which the floors and ceilings are constructed of metal beams between which are extended wire strands that serve to sustain a mass of concrete or like material comprising the body of the floor or ceiling, an example of this type of structure being illustrated in Letters Patent of the United States No. 455,687, granted to the United States Fire Proofing Company, as my assignee, July 7, 1891.

My present invention consists in the novel features of construction hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the claims at the end of this specification.

Figure 1 is a view in vertical section through a fire proof floor embodying my improvements. Fig. 2 is a plan view showing the beams and wire strands, but with the concrete filling omitted. Fig. 3 is a detail perspective view of one of the pulley plates for the tops of the beams. Fig. 4 is a detail view showing the pulley blocks for the base of the beams. Fig. 5 is a view showing the manner of laying the strands with modified form of pulley blocks. Fig. 6 is a vertical longitudinal section with modified pulley blocks removed. Fig. 7 is a detail plan view of one of the modified pulley blocks for the beams.

A and B, B' and B² designate the metal beams that will be sustained by the walls of the building in usual or suitable manner. To the end beam A is connected one or more anchor plates C, each of these anchor plates being furnished with a downwardly turned lip or flange c to engage the upper and outer flange of the I-beam A, and each of the plates C is provided with hook portions c' to retain the cross bar D to which the ends of the wire

strands E are connected. The plate C, (when a continuous plate is employed) is cut away as at c² to permit the passage of the strands E around the bar D. The ends of the strands E when passed around the bar D will be held by suitable clips e. The strands E thus attached to the beam A are drooped or depressed and extend beneath the next succeeding I-beam B which serves to retain the strands in depressed or drooped condition and enables the strands to be placed under proper tension.

To the base of each of the beams B, B', B², &c., are attached the pulley blocks F (see Fig. 4), these blocks having lips f to engage the base flanges of the beams and having bearings f' to receive the journal of the pulleys F' beneath which pulleys the strands of wire will pass. Preferably, each of the pulley blocks F is constructed as shown in Fig. 4, the lower part of the pulley block being furnished with a cross bar f² that serves to prevent any possible depression or sagging of the wire strands. By preference, also, the pulley blocks F are formed each of a single plate bent as shown in Fig. 4, although it is manifest that this precise manner of forming the pulley blocks may be varied if desired. The strands E having passed beneath the beam B thence pass above the beam B' and preferably the tops of the beams B, B', B², &c., are furnished with the pulley plates G having their ends bent as at g and slotted as at g' to receive the pulleys G' over which the strands of wire will pass. From the beam B', the strands E will be again depressed and will pass beneath the beam B², and so on throughout the series. Inasmuch as the strands of wire pass beneath one set of beams and over another set, it is manifest that when the wire strands are placed under tension, the beams will serve to hold the wire strands in depressed condition and in position to effectively sustain the concrete filling H.

In the preferred form of my invention I provide not merely the strands E extending above and beneath the metal beams in manner above described, but provide also a second set of wire strands E' preferably alternating with the strands E in manner illustrated in the drawings. The ends of the

strands E' are attached to a cross bar D' that is engaged by the hooks c' of the anchor plate C, the opposite edge of this anchor plate being furnished with the turned lip c that engages the base flange of the beam A. The ends of the strands E' are securely held by means of metal clips e. The strands E' thus connected to the base of the beam A pass thence above the beam B and over the pulleys G' of the pulley plates G, and from the top of the beam B the strands are depressed so as to pass beneath the beam B', being there engaged by the pulley blocks F, and thence up over the beam B² and so on throughout the various beams of the floor structure. By thus arranging the strands E and E' so that they shall cross each other between the beams, I secure a most effective net-work for sustaining the mass of concrete filling at all points between the beams. So also, by passing the wire strands above and beneath the beams I am enabled to secure the strands under tension and in the desired position without the necessity of employing supplemental tension devices for such purpose. By employing the pulleys F and G' for the wire strands, these strands can be much more readily placed under tension than would be possible if the strands were drawn directly over the tops and bottoms of the beams, and it will be understood that any suitable mechanism may be employed for giving the desired tension to the strands, the ends of which will be fastened in convenient manner after the desired tension has been maintained.

It is obvious that instead of the strands consisting of single wires as shown, these strands may consist of cables formed of a series of wires in which case the distance between the strands may be greater, and if desired such strands or cables may be provided with a suitable protective coating. This construction and arrangement will be found especially advantageous when coated strands or cables are used, because the roller will prevent the removal of the protective coating from the strands or cables which would result if the strands or cables rested directly on the beams.

In the modified form of the invention illustrated in Figs. 5, 6 and 7 of the drawings, I show the improved construction of pulley blocks from the tops and bottoms of the beams and adapted to be removed after the proper tension has been given to the wire strands E and E'. These removable pulley blocks comprise the bars R and R', that bear upon the beam as seen in Figs. 6 and 7, so that the pul-

leys G' extend at a sufficient distance from the face of the beams to save the strands E and E' from friction thereon. The ends of the bars R and R' are provided with bearings r to receive the journals of the pulleys G'. The journal pin of one of the pulleys G' will have a screw threaded end g⁴ on which will fit a nut g⁵ so that this pin, on which the pulley is loosely held, can be withdrawn until its opposite end passes from off the seat or bearing r of its bar R', thereby permitting the bar R' to be freed and both bars and pulleys to be removed. When the bars and pulleys are removed, the wire strands E and E' will bear against the beams as seen in Fig. 6 of the drawings.

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

1. In fire proof structures the combination with the beams of wire strands supported thereby, the same strands extending beneath the bottoms of some of said beams and above the tops of others of said beams, substantially as described.

2. In fire proof structures, the combination with the beams of wire strands extending beneath and above the beams, and suitable pulley blocks for the strands, substantially as described.

3. In fire proof structures, the combination with the beams of the wire strands E extending above and beneath the beams, and pulley blocks and plates attached to the top and bottom of the beams, said pulley blocks and plates being provided with pulleys for the wire strands, substantially as described.

4. In fire proof structures, the combination with the beams of two sets of wire strands supported by said beams, each set of strands extending beneath the bottoms of some of said beams and above the tops of others of said beams, said sets of strands crossing each other intermediate the beams, substantially as described.

5. In fire proof structures, the combination with the beams of strands extending across said beams, pulleys over which said strands pass, and pulley blocks for connecting said pulleys to the beams, said blocks being united to the pulleys in manner permitting the pulleys to be removed from the strands under tension, substantially as described.

MITCHELL F. MCCARTHY.

Witnesses:

GEO. P. FISHER, Jr.,
FRED GERLACH.