(No Model.) 2 Sheets—Sheet 1.

M. F. McCARTHY.

CONSTRUCTION OF FIREPROOF FLOORS, &c.

No. 520,491. Patented May 29, 1894.

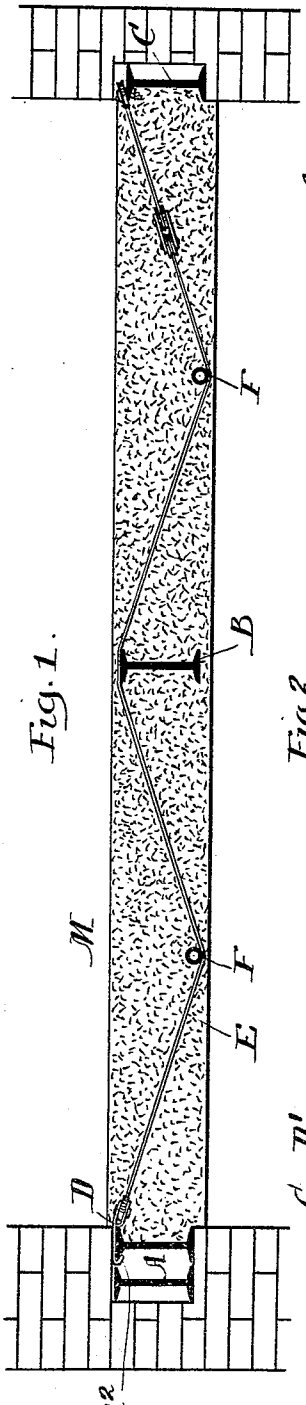


Fig. 1.

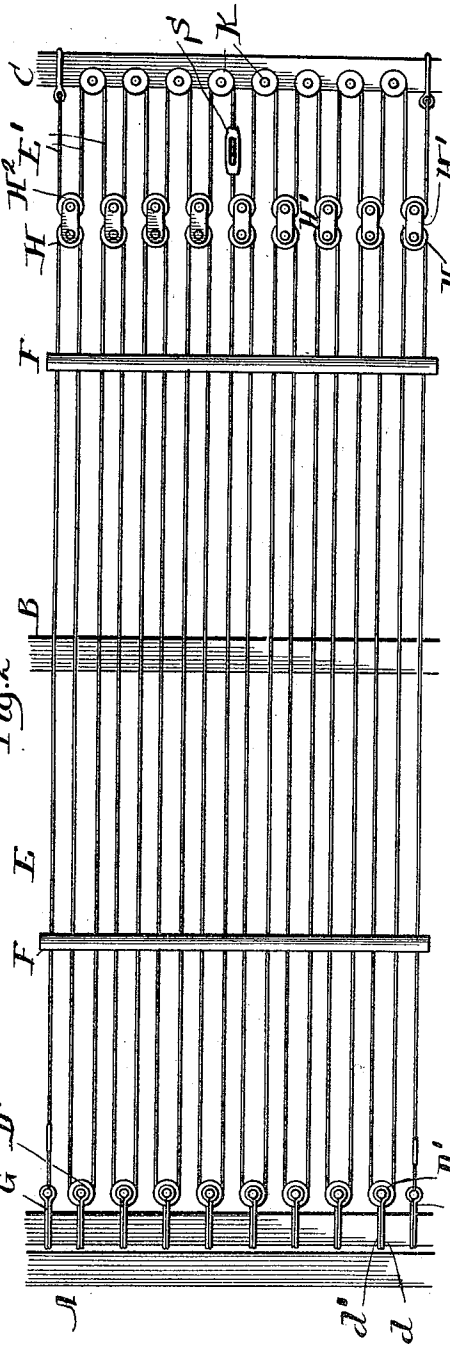


Fig. 2.

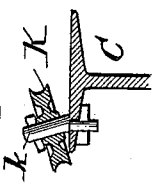


Fig. 4.

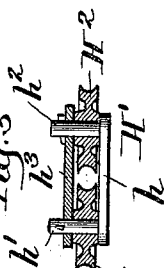


Fig. 5

Fig. 3.

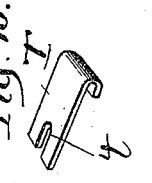


Fig. 10.

Witnesses:
Fred Gerlach
A. Adamick.

Inventor:
Mitchell F. McCarthy
By Prin & Fisher
Attorneys

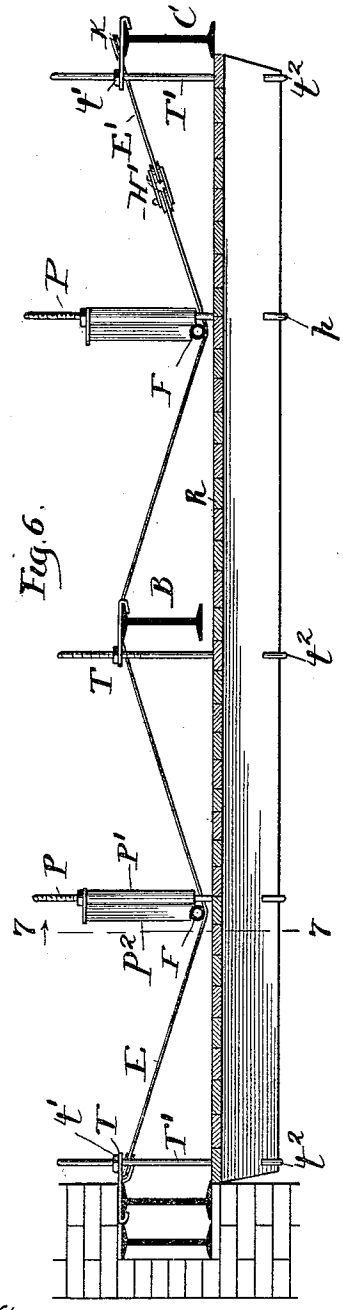
THE NATIONAL LITHOGRAPHING COMPANY.
WASHINGTON, D. C.

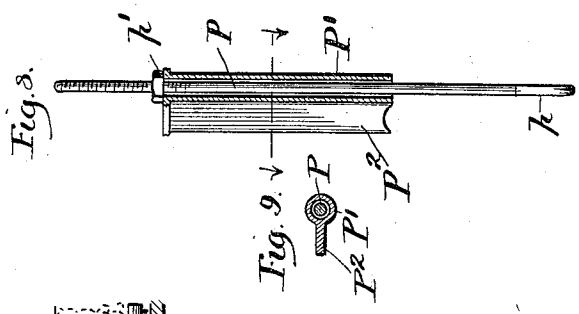
(No Model.) 2 Sheets—Sheet 2.

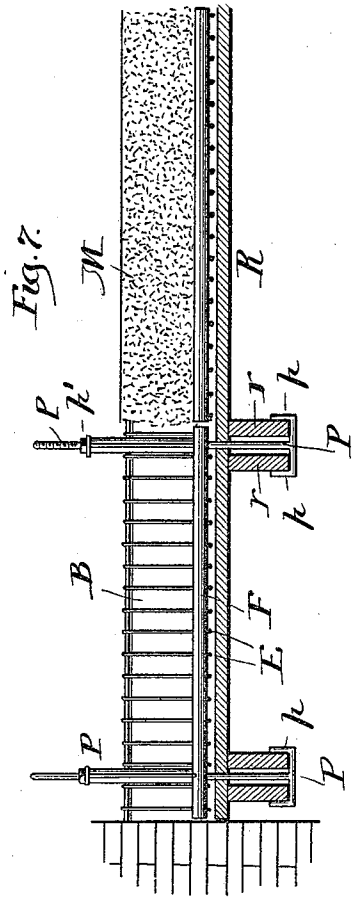
M. F. McCARTHY.

CONSTRUCTION OF FIREPROOF FLOORS, &c.

No. 520,491. Patented May 29, 1894.







Witnesses:
Fred Gerlach
A. Adamick.

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

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

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

CONSTRUCTION OF FIREPROOF FLOORS, &c.

SPECIFICATION forming part of Letters Patent No. 520,491, dated May 29, 1894.

Application filed May 23, 1893. Serial No. 475,273. (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 the Construction of Fireproof Floors, Ceilings, and the Like, of which the following is a specification.

In Letters Patent of the United States, No. 455,687, granted to the United States Fire Proofing Company, as my assignee, July 7, 1891, there is described the type of fire proof floors, ceilings, and the like to the construction of which my present invention is more particularly directed; that is to say, the present invention is more especially designed to provide improved means whereby the strands or wires that aid in sustaining the plastic filling comprising the body of the floors can be more readily and effectively laid and placed under the desired tension.

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

Figure 1 is a view in vertical longitudinal section through a fire proof floor, the strands or wires of which have been laid in keeping with the present invention. Fig. 2 is a plan view of the structure shown in Fig. 1, the concrete filling being omitted. Fig. 3 is a detail perspective view of one of the pulley blocks. Fig. 4 is a detail view showing one manner of connecting one set of pulleys to the beams. Fig. 5 is a detail view in vertical section through the double pulley blocks. Fig. 6 is a view in vertical longitudinal section through the floor beams, showing also the strands or wires under tension, with the apparatus for maintaining the tension and showing also the temporary staging and means for sustaining the same. Fig. 7 is a view in cross section on line 7—7 of Fig. 5. Fig. 8 is an enlarged detail view of the tension screw-mechanism. Fig. 9 is a view in horizontal section of the rod and sleeve of the tension screw mechanism. Fig 10 is a detail perspective view of one of the brackets for sustaining the temporary staging.

Referring more particularly to Figs. 1 and 2 of the drawings, A, B and C denote the floor beams of usual or suitable construction. To one of the end beams A is connected a series of pulley supports D, these supports consisting preferably of the two bars d and d', each of the bars having its end formed with a hook d^2 to engage the flange of the I-beam A. The bar d has a loop d^3 at its inner end and the bar d' has a loop d^4 at its inner end, but the inner portion of the bar d' is bent downwardly as shown, in order to provide a space to receive the pulley D'.

My purpose in forming the pulley supports D of separate bars, as I prefer to do, is to enable the wire strands E to be more readily passed around the pulleys D' as will presently more fully appear. The wires E in the construction shown are drooped between the beams A, B and C and across the drooped strands E extend the cross bars F. The strands E consist preferably of a wire having one end attached to an anchor hook G, this wire being extended over the pulleys D' and over the pulleys H that are carried by the pulley blocks H' (see Fig. 5). The pulley blocks H', each carry two pulleys H and H^2 and each of these pulley blocks preferably comprises a base plate h from which rise pins h' and h^2 whereon are journaled respectively the pulleys H and H^2. A top plate or keeper h^3 serves to retain the pulleys H and H^2 upon their pins h' and h^2. Around the pulleys H^2 are trained the strands E', these strands passing also around a series of pulleys K that are preferably journaled upon studs k that are suitably secured to the flange of the I-beam C, preferably by bolts passed through holes drilled in the flange of the beam. The strands E' consist preferably of a single wire that is trained over the series of pulleys H^2 and K as more particularly shown by Fig. 2 of the drawings. In Figs. 1 and 2 of the drawings, the strands E and E' are shown in the position which they occupy when the filling M of concrete or like plastic material has been laid between the beams and about the strands. My purpose in passing the strands around the pulleys is more particularly to enable a uniform tension to be given to the strands so that the strains upon the flooring will be more uniformly distributed and effectively resisted.

The advantage of this method of laying the strands, over the method heretofore employed in which each of the strands consisted of a single wire, the ends of which were independently attached to the beams, will be apparent when it is considered that in the laying of these strands or wires, tension is given thereto and it is highly desirable that a uniform tension should be given to all the strands; yet it is manifestly difficult to give with exactness the same tension to the various strands when these strands are independent of each other and are placed under tension by different devices and frequently by different workmen. When, however, the strands are formed of continuous wires extending over suitable supports in such manner that when the tension is placed upon the strands it will be distributed uniformly, the danger of unequal tension is avoided.

In placing the strands E and E′ in position, the wires from which these strands are made may be laid between the pulleys H and H^2 of the pulley blocks H′, one end of the strands E being connected to the hook G, and one end of the strands E′ being connected to the beam C. The strands E will be passed around the pulleys D′, the bars *d* and *d′* being opened in order to allow the wire to be slipped around the pulleys. So also the wire comprising the strands E′ will be looped around the pulleys K. A suitable stretching device such for example as a turnbuckle S is interposed in the wire comprising the strands E′ and by this means the strands E and E′ will be drawn taut. While in this taut condition, if the strands are to be depressed as shown in the drawings, a bar F will be placed centrally across the strands E, and by suitable apparatus, to be presently described, the bar F will be depressed thereby drawing downward the strands E and distributing the strain uniformly throughout the strands. A second bar F will next be placed between the beams B and C, and by means of the tension mechanism this bar will be depressed in like manner and the strain upon the various strands will be uniformly distributed as the bar is brought to its extreme point of depression. If it is found that too great a strain is imparted to the strands E, then the wire comprising the strands E′ can be slackened, or, on the other hand if it is found that the tension of the strands E is insufficient, then the strands E′ will have greater strain imparted thereto by the stretching mechanism attached to the wire comprising the strands E′. It is manifest that while employing a series of short strands E′, trained over suitable supports which permit the tension to be given to the strands, I am enabled to readily place the strands E under tension. It is obvious that instead of laying the strands in manner above described, these might be laid in any other suitable or convenient manner.

The mechanism which I prefer to employ for depressing the strands E, (when it is desired to droop the wires between the beams,) consists of an adjusting rod P, the lower end of which is provided with one or more hooks or extensions *p*, to engage the joists *r* of the temporary staging R. The adjusting rod P passes through a sleeve P′ and at its upper end is screw-threaded to receive a screw nut *p′* that bears upon the top of the sleeve P′ and serves to depress the sleeve. The sleeve P′ is preferably formed with an extension P^2 adapted to bear upon the cross rod F.

From the foregoing description it will be seen that when the strands E and E′ have been strung around the pulleys D′ H, H^2 and K and a cross rod F has been placed upon the strands E, the adjusting rod P will be passed upward until its hooks (one or more) engage the joists of the temporary staging, while its upper portion passes through the sleeve P′, the extension P^2 of which rests upon the cross bar F. Any desired number of adjusting rods and sleeves will be thus placed in position upon the cross bar F, depending upon the length of the bar. The nuts will now be drawn downward until the strands E have been depressed to the desired extent. The adjusting rods P and sleeves P′ will be allowed to remain in position until after the filling M of concrete or like plastic material has been placed in position and has sufficiently hardened to retain the strands under the proper tension. The sleeves P′ will then be drawn upward from the plastic mass and the adjusting rods P will be drawn downward through the plastic mass and through the temporary staging. It will thus be seen that the adjusting rods and sleeves co-operate in insuring a uniform distribution of tension over the various strands E and E′ when these strands are supported in such manner that the strain from one strand can be distributed over the others. In order to sustain the temporary staging in proper position for receiving and temporarily supporting the plastic mass employed in a floor construction, I attach to the beams, suitable brackets T, having slots or sockets to receive the suspension hooks T′, the threaded ends of these hooks being provided with adjusting nuts *t′*, while the lower ends of the hooks are provided frequently with one or more arms or extensions t^2 to engage the joists of the flooring. By thus employing the plates and suspension hooks T′, the temporary flooring can be readily retained in position without the necessity of using beams extending across the beams A, B and C and it will not interfere with the filling in of the plastic mass between the metal beams. By providing the brackets T with the small slots *t* these brackets can be used with beams of different widths and the rods T′ can be set within the sleeves so close to the beams that a strain of the rods will fall almost directly upon the beams and all bending of the brackets T will thus be guarded against.

It is manifest that the details of construc-

tion above set out may be varied without departing from the spirit of the invention and to such details, therefore, I do not wish the invention to be understood as restricted.

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

1. The combination with the beams of a series of strands, extending between the beams and a supplemental strand connected to said main strands whereby tension may be given thereto, substantially as described.

2. The combination with the beams of a series of strands extending between the beams, a series of pulleys engaging said strands and a supplemental strand whereby tension may be given to the main strands, substantially as described.

3. The combination with the beams of a series of strands extending between the beams and pulleys around which said main strands pass, a tension strand and pulleys therefor connected to the pulleys for the main strands whereby tension may be given to said strands, substantially as described.

4. The combination with the beams, of a series of strands and suitable supports around which said strands pass in sinuous course back and forth between the beams whereby uniformity of tension may be given to said strands, substantially as described.

5. The combination with the beams of strands sustained by the beams and pulleys around which said strands pass, substantially as described.

6. The combination with the beams, of a series of strands E, suitable supports over which said strands freely pass, a second set of short strands E′, suitable supports over which said strands E′ freely pass, said strands E and E′ being connected together whereby when said strands E′ are stretched, tension will be imparted to said strands E, substantially as described.

7. The combination with the beams, of a series of strands E, pulleys D′ and H around which said strands E pass, a second set of strands E′ and pulleys H^2 and K around which said strands E′ pass, said pulleys H and H^2 being connected together whereby the strain upon the strand E′ can be imparted to the strand E, substantially as described.

8. The combination of the beams, the strands E, the pulleys D′ and suitable supports wherein said pulleys are held, each of said supports having a movable portion to permit the strands to be slipped over the pulleys, substantially as described.

9. The combination of the beams, the strands E, the pulleys D′ and the supports D formed of the separate bars d and d', substantially as described.

10. The improved mechanism for imparting tension to the wires, comprising an adjustable rod P, and a sleeve P′ through which said rod passes, said rod having its lower ends adapted to engage the temporary flooring (and said sleeve having lateral extension), substantially as described.

11. In fire proof structures, the combination with the beams of brackets P′ having hooks to engage the beams, and adjustable rods P engaging the brackets P′ and serving to sustain the temporary flooring, substantially as described.

MITCHELL F. McCARTHY.

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