(No Model.) 2 Sheets—Sheet 1.

C. F. W. DOEHRING.

FIRE PROOF CEILING AND FLOOR.

No. 347,474. Patented Aug. 17, 1886.

Fig. I.

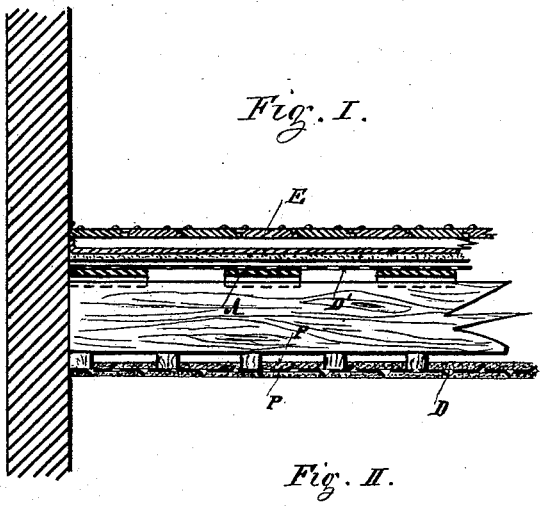


Fig. II.

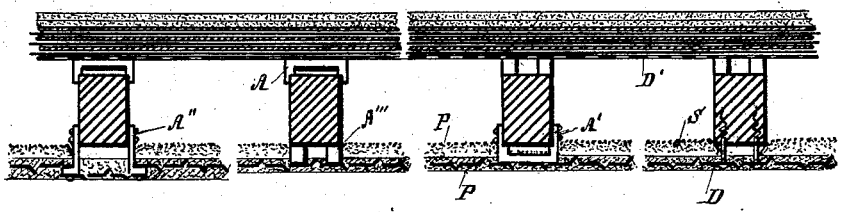
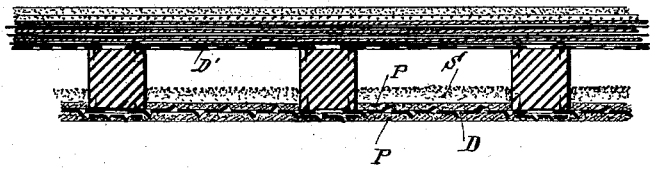


Fig. III.



Witnesses.
Robt. H. Roy
Thos. Turner

Inventor.
C. F. W. Doehring.
per Roudebush & Briesen
Attorneys.

(No Model.)

2 Sheets—Sheet 2.

C. F. W. DOEHRING.

FIRE PROOF CEILING AND FLOOR.

No. 347,474. Patented Aug. 17, 1886.

Fig. IV. Fig. V Fig. VI.

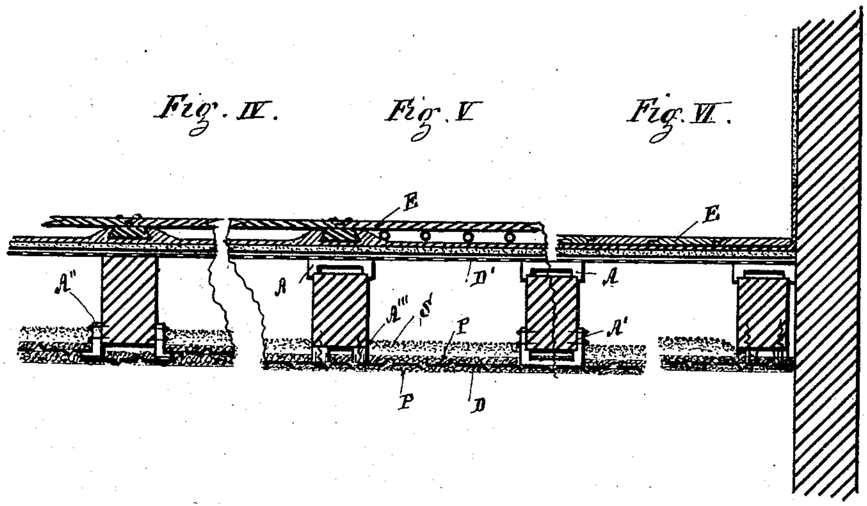
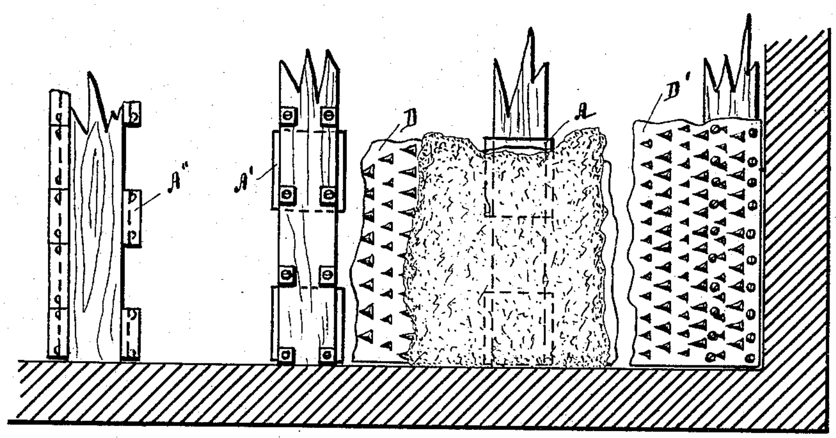


Fig. VII.



Witnesses.
Robt. F. Roy.
Thos. Turner

Inventor.
C. F. W. Doehring
per Roeder & Briesen
Attorneys

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

CARL FRIEDRICH WILHELM DOEHRING, OF LEIPSIC, SAXONY, GERMANY.

FIRE-PROOF CEILING AND FLOOR.

SPECIFICATION forming part of Letters Patent No. 347,474, dated August 17, 1886.

Application filed January 2, 1886. Serial No. 187,323. (No model.)

To all whom it may concern:

Be it known that I, CARL FRIEDRICH WILHELM DOEHRING, of Leipsic, Saxony, Germany, have invented a new and useful Improvement in Fire-Proof Ceilings and Floors, of which the following specification is a full, clear, and exact description.

The floors and ceilings as usually constructed do not possess the desirable security against fire, water, and decay. The floors must be so made that they form a horizontal layer which is fire and water proof and is still capable of being ventilated and heated. The series of beams toward the ceiling must be protected in such a manner against injurious influences that the beams are confined in spaces without excluding ventilation. The fire and water proof floor is to be so constructed that the ordinary as well as an inlaid covering may be securely attached thereto. The ceiling is to be light and must permit the application of wood cement in not too thick layers, as the latter would be apt to flow together, and would thus produce a shifting in the several layers of cement. To obtain the above-named advantages, I have adopted the construction shown in the accompanying drawings, where—

Figure I is a longitudinal section of part of a floor; Fig. II, a cross-section of the same. Fig. III is a cross-section of a floor, showing slight modifications. Fig. IV, V, and VI are cross-sections of floors, showing modifications. Fig. VII represents top views of various parts of the floor shown in Figs. IV, V, and VI in section.

The main result to be obtained is that the series of beams shall be separated from the rooms by fire-proof substances while the necessary ventilation of the single beams and the entire series is not missing, ventilating-openings being made in the front wall. The floor must be so constituted that it is absolutely fire and water proof, and that it possesses the quality to protect the beams from flames. The beams are therefore supplied with a top layer of porous specifically light fire-proof molded stones, A, which may be nailed down. The stones are so applied that channels are formed in which the wood does not come in contact with the stones. At the lower part of the beams similar molded stones, A′, may also be applied; but it is preferred to substitute simple plates A″, Figs. II and IV, in order to obtain a larger space from the beams to the plaster ceiling. These plates should also be made from fire-proof porous stones that can be nailed down. The stones above and below the beam protect the latter completely against the effects of fire, because the beams are by the stones removed from the effects of the greatest heat. The lower stones serve not only to protect the beams and to receive a layer of ashes beneath the beams, but to them (or to the beams) are nailed or otherwise attached perforated sheet-metal plates D. These perforated sheet-metal plates may have the size of ordinary boarding or have a different size. They are covered with plaster P and form a fire-proof covering which excludes the heat from the beams.

To increase the protection afforded by the sheet-metal plates they may be provided with a layer of ashes, S, or any other poor conductor of heat. These plates D may also be formed of porous clay or of cement plates, and the latter may be joined by tongues and grooves.

The ceiling constructed as above possesses the qualities which are designed to protect the beams from the action of the fire. The floor shows the same characteristics as the ceiling. The molded stones placed over the beams serve for the reception of perforated metal plates D′. These plates may be replaced by a metal fabric or by metal strips. The metal layer is covered with gypsum or a similar material, and if desired dissolved paper-pulp may also be applied. Upon the surface thus obtained an isolating layer of ashes or other material is applied. This layer is held in place by suitable means, so that a top layer of fire and water proof cement of lime or gypsum obtains a solid foundation.

The fire and water proof layer of lime, gypsum, or cement is produced by a mixture of lime or cement with sharp building-sand. The proportions of the mixture depend upon the use to which the floor is to be put, and if desired the mixture may be colored in suitable manner. To cover this fire-proof layer with the flooring a peculiar mode of attachment is adopted. The cross-pieces upon which the flooring-boards are to be attached are intimately connected with the layer of cement by brushing diluted sulphuric acid upon those parts of the cement into which the cross-pieces

are embedded, which are to support the tongued and grooved flooring-boards E. These cross-pieces may also be replaced by strips of stones adapted to nail the boards upon the same. The boards are then embedded into gypsum. By the application of sulphuric acid sulphate of lime is drawn out of the layer of cement. By this process a firm and durable connection is obtained, which permits a safe application of the boards, while at the same time if the top of the cross-pieces are a little raised above the cement a free space may be obtained between the cement and the flooring. This space is admirably adapted for ventilating and heating purposes.

If desired, the flooring may be placed directly upon the fire-proof layer of lime, gypsum, or cement by treating the entire cement layer with sulphuric acid. In this case stronger flooring-boards must be provided, which are connected with the cement by a proper adhesive material in a substantial and durable form.

I claim as my invention—

1. The combination of floor-beams and of channeled porous fire-proof stones above and below said floor-beams, with an insulating material and with metal plates attached to said stones, and with a plaster coating, substantially as specified.

2. The combination of a fire-proof layer with molded bricks that cover the beams and with a metal layer, the fire-proof layer being composed of ashes and of lime, gypsum, or cement treated with sulphuric acid, all being so constructed that a space is left beneath the flooring, substantially as specified.

3. The combination of a fire and water-proof floor with veneers which are made fire-proof and water-proof, and which are glued directly upon the surface of the floor, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL FRIEDRICH WILHELM DOEHRING.

Witnesses:

EDMUND BACH,

OTTO GÜNTHER.