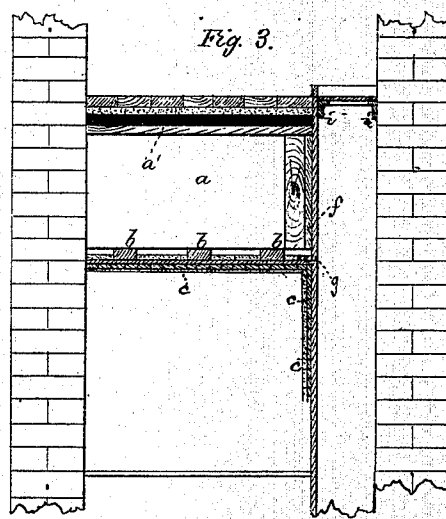
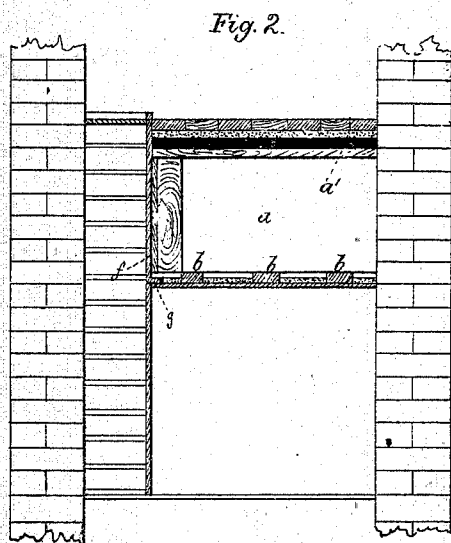
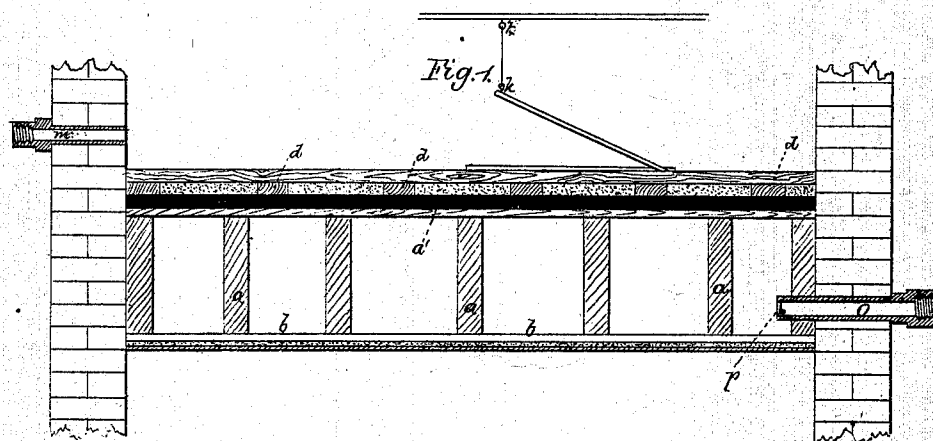


H. H. BRYANT.
Construction of Buildings.

No. 139,451.

Patented June 3, 1873.



Witnesses.
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H. C. Boardman

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UNITED STATES PATENT OFFICE.

HEZEKIAH H. BRYANT, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN THE CONSTRUCTION OF BUILDINGS.

Specification forming part of Letters Patent No. **139,451**, dated June 3, 1873; application filed December 6, 1872.

To all whom it may concern:

Be it known that I, HEZEKIAH H. BRYANT, of Boston, Suffolk county, Massachusetts, have invented certain Improvements in Fire-Proof Structures, of which the following is a specification:

My invention relates to a plan of constructing ceilings, floors, and roofs, which will perfectly adapt them to receive and to retain a supply of water, thereby imparting to them the perfect protection which water affords against the generation of any degree of temperature that will impair their strength or durability in the least degree.

In the accompanying drawing, Figures 1, 2, and 3 are sections of my invention.

A practical method of applying my invention to a building may be described as follows: Supposing that the joists have been fixed in the walls of a building in the usual manner, I proceed to apply to the under edge of the joists *aaa*, Fig. 1, furring-strips *bbb*, Fig. 2, at right angles to the line of said joists; said furring-strips being about one and one-half inch square, and placed at suitable distances to receive the metal plates that are to be fixed to them. When these furring-strips have been properly secured to the joists I proceed to secure to them sheets of iron or other metal, until the whole surface of the ceiling is covered by them from wall to wall. Upon the upper surface of these iron plates I apply a coating, in a liquid state, of water-lime, or other non-combustible and water-resisting cement, for the double purpose of preventing the iron from corroding, and of rendering the joints between the plates of iron substantially water-tight. My object in fixing the iron plates to the furring-strips *bbb*, instead of to the joists *aaa*, is that of placing each one of the spaces between the several joists in free communication, the one with all others, so that water falling into any one of said spaces will find free access to all the others, as will the steam or vapor that may be generated therefrom, thus giving, from any given point, an equal protection to all others exposed to the action of heat. As an equivalent of said furring-strips for said purpose, it will be found more or less practicable to cut slots in the joists; that plan, however, impairs their strength. If suit-

able corrugations or moldings are formed in the metal plates, they will, in and of themselves, provide a sufficiently artistic ceiling; but the iron plates may be put up in the ordinary merchantable condition of sheet iron, and furring-strips applied beneath them to receive laths and plaster in the usual manner, as shown at *ccc*, Fig. 3. Upon the upper edge of the joists *aaa* I lay a rough board floor, suitable to receive a coating of tarred paper, to which is applied a heavy coating of tar much the same as that species of roofing is done; this is done to produce a perfect and permanent water-tight shed over the lower parts of the building, and it may be accomplished by various methods, of which the above described is one practicable way. Upon this water-tight shed *a* I secure furring-strips *ddd*, about two inches square, and placed about two feet apart; and when these furring-strips are properly secured to the water-tight shed I proceed to fill up the spaces between them with mortar or any non-combustible material until the level of said furring-strips is reached, after which everything is ready for laying the floor, in the usual manner, and securing it to said strips. Furring-strips are also applied to the face of the beams, forming well-holes for stairways or hoist-ways, as shown at *fff*, Fig. 3, and on said strips metal plates are secured, said plates having a flange, *ggg*, at their lower edge, so as to form a union with the iron plates fixed to the lower edge of the joists *aaa*, as before set forth, while the upper edge of said plates rise above the level of the floor some two or more inches, to form a barrier against the flow of water through said well-holes to lower stories of the building. These plates having been properly secured to the furring-strips *fff*, Fig. 3, I proceed to fix to the surface of said plates a flange, formed by angle iron or otherwise, shown at *iii*, to form a support for a fire-proof door or trap, when it is shut down to close said well-holes. A good plan for the construction of such fire-proof doors or traps, so as to prevent their being warped by intense heat, is that of fixing to common gas-pipe thin sheets of iron; the pipe-frame being made of a suitable size to close the well-hole completely and rest upon the flange *iii* when such traps are closed.

At O, in Fig. 1 of the drawing, a waste-pipe is shown, having a waste-way, *p*, located an inch or more above the level of the ceiling, and in each story of the building, for the purpose of carrying off the surplus water used to extinguish a fire. The waste-pipe O may discharge into the street or the street-sewers, as desired.

A correct comprehension of the foregoing-described construction of ceilings and floors points out the essence of my invention to consist in providing a water-tight shed or substructure for floors, and protecting the same for a time from the action of fire by an overlying coat of non-combustible and non-heat-conducting material, and of providing a metallic ceiling to the lower edges of the joists in such manner as will make it substantially water-tight, and also leave the spaces between the joists in free communication, the one with another, for the purpose of providing for a supply of water to the upper surface of the ceiling.

My purpose in providing a water-tight shed beneath the floor of a building is that of guarding against the fall of water, used to extinguish a fire, to lower stories of a building, it being the experience of underwriting that more loss is caused by water than by the fire, upon the average; but, beside preventing such

fall of the water, it insures a submersion of the floor, making it absolutely indestructible.

If it is merely desired to render the floors water-tight, it will be more or less practicable to omit the filling of non-combustible material applied over the water-tight shed.

I claim—

1. The combination of a water-tight shed or substructure provided to the floor of a building, with a metal ceiling, substantially as or for the purposes set forth.

2. The combination of a metal ceiling rendered substantially water-tight, with the joists of a building, wherein the spaces between the joists are kept in communication with each other, substantially as and for the purpose shown and specified.

3. The combination of a water-tight deck, with a superposed layer or coating of non-combustible material and the ordinary floor of a building, substantially as and for the purposes specified.

4. The combination with a metal ceiling of the furring-strips and laths to receive plaster, substantially as shown and described.

HEZEKIAH H. BRYANT.

Witnesses:

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