

No. 614,754.

Patented Nov. 22, 1898.

E. L. PEASE.

CONSTRUCTION OF FIREPROOF FLOORING, &c.

(Application filed June 7, 1898.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

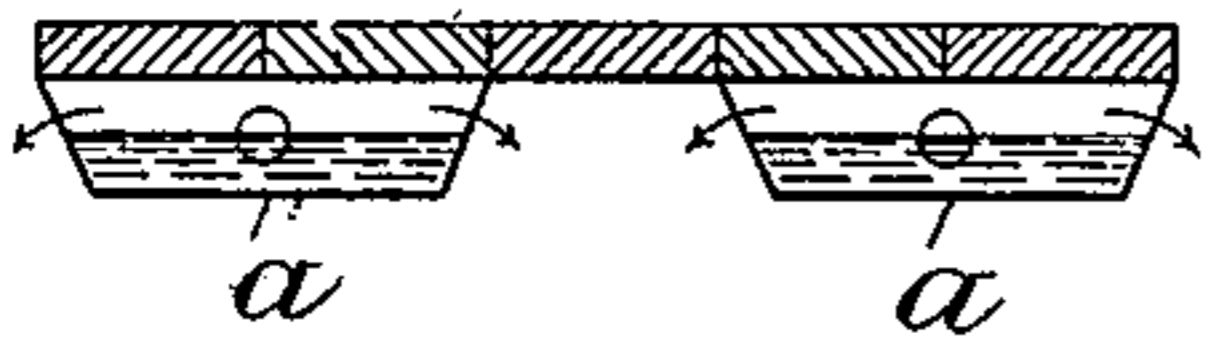


Fig. 2.

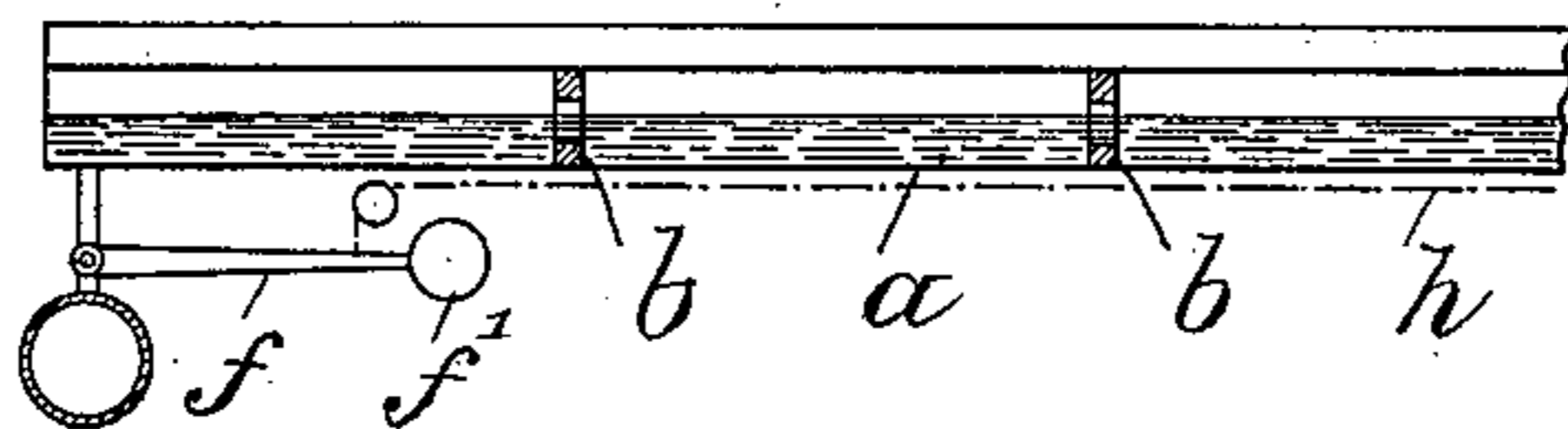


Fig. 3.

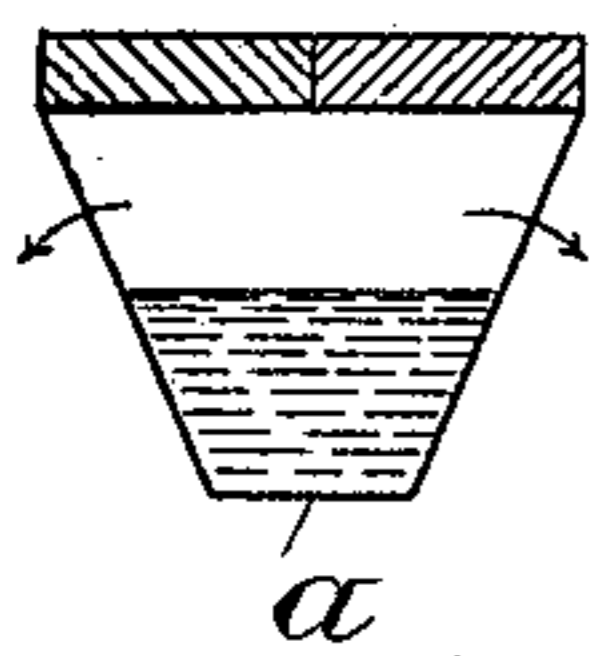


Fig. 4.

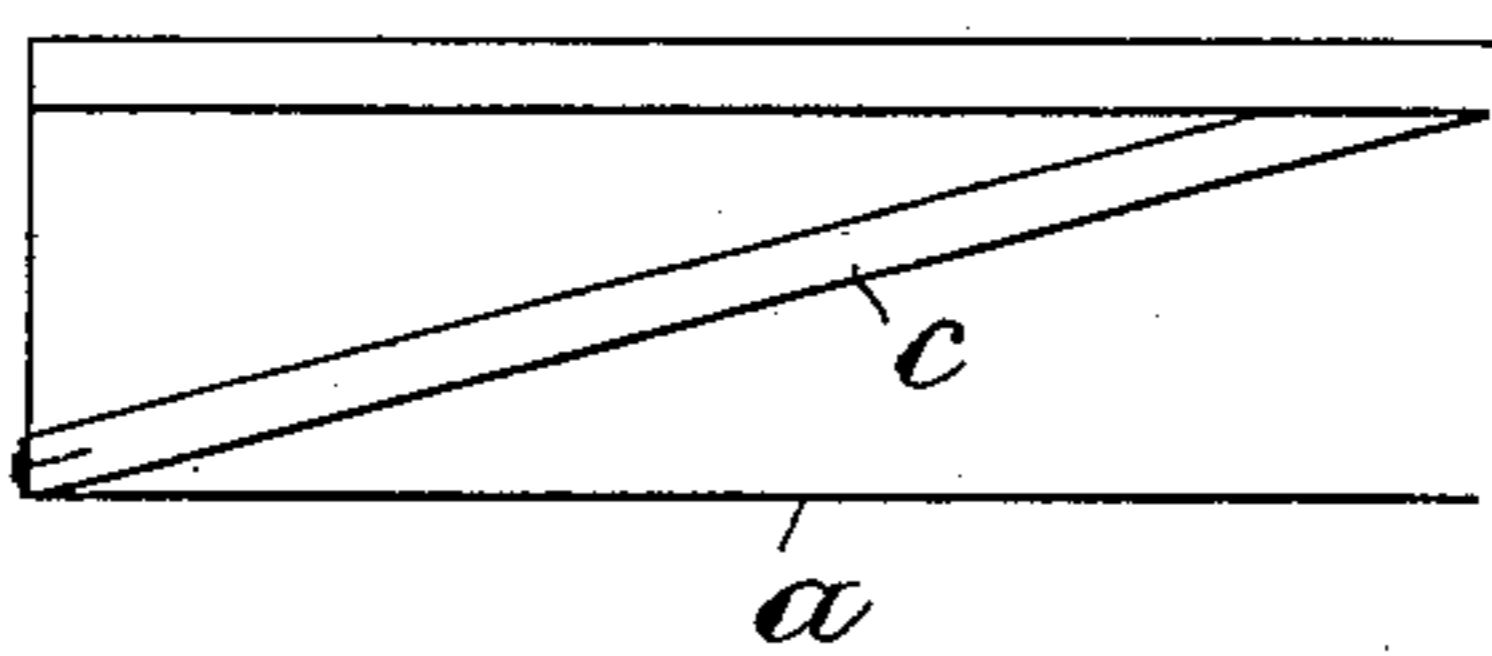


Fig. 5.

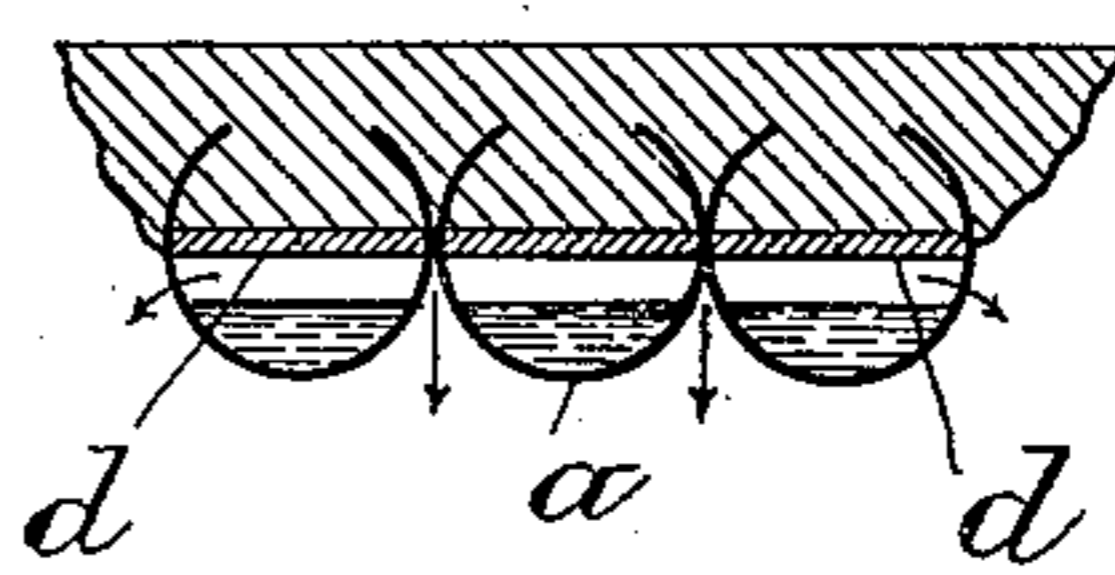


Fig. 6.

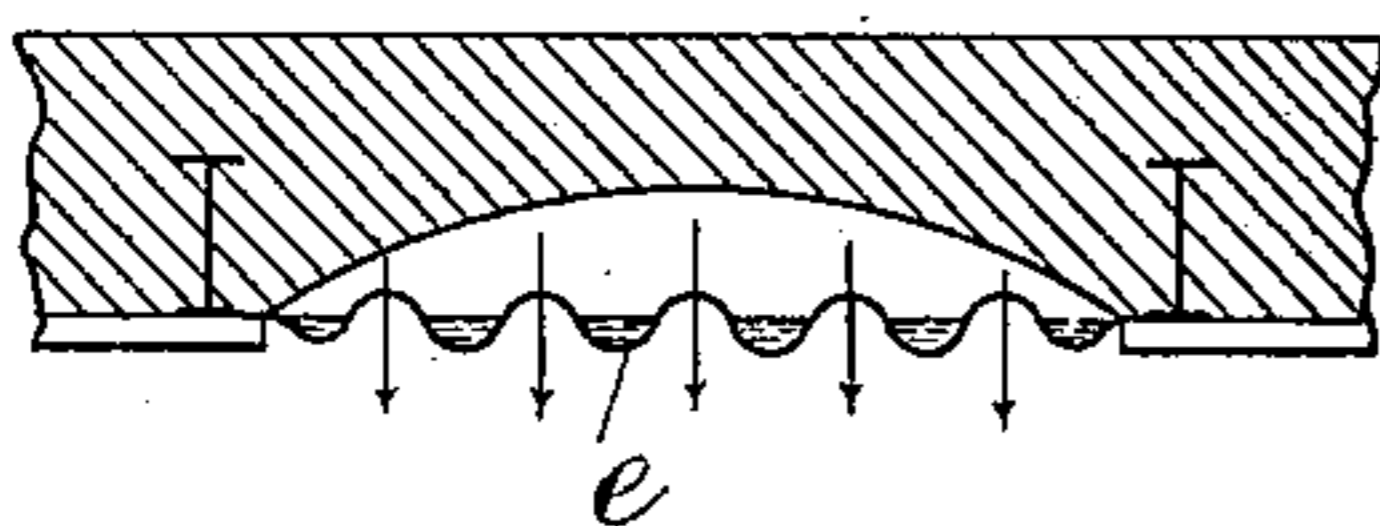


Fig. 7.

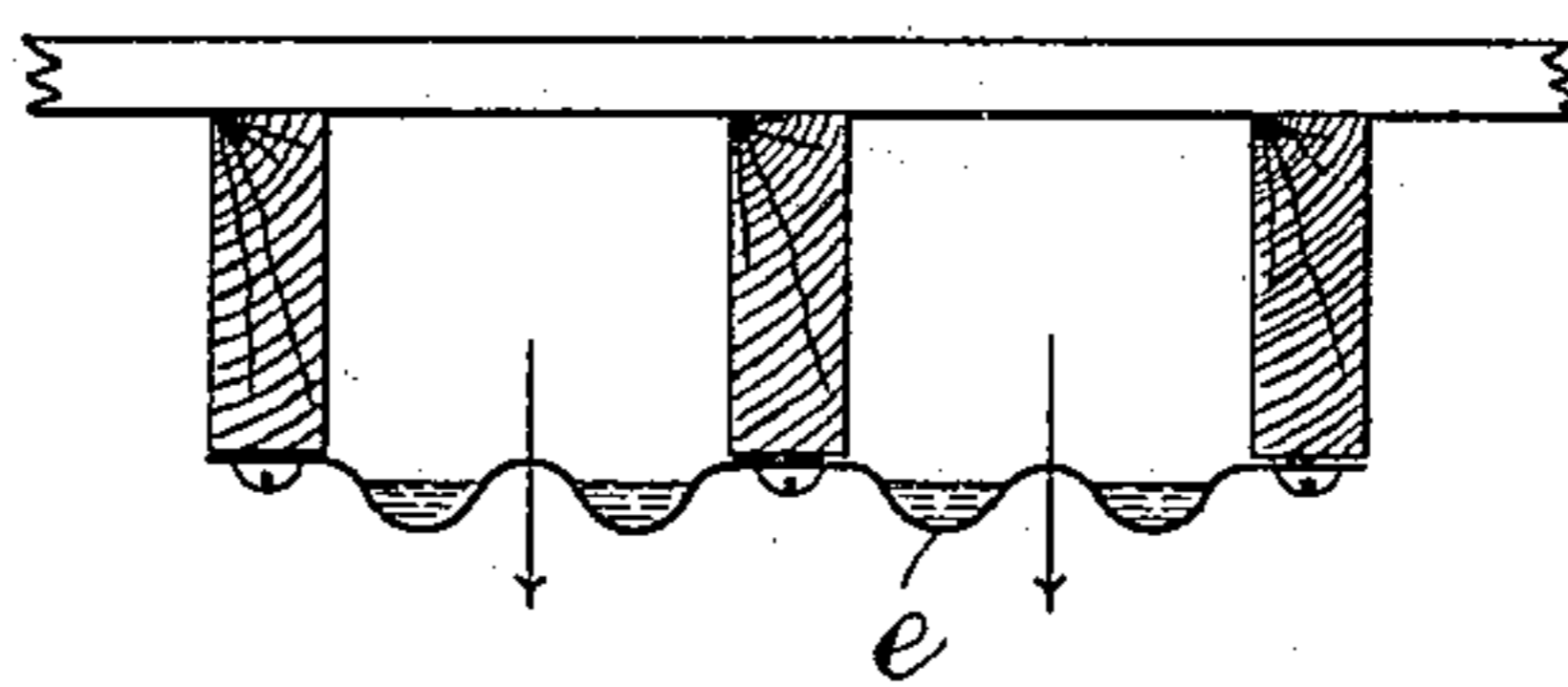


Fig. 8.

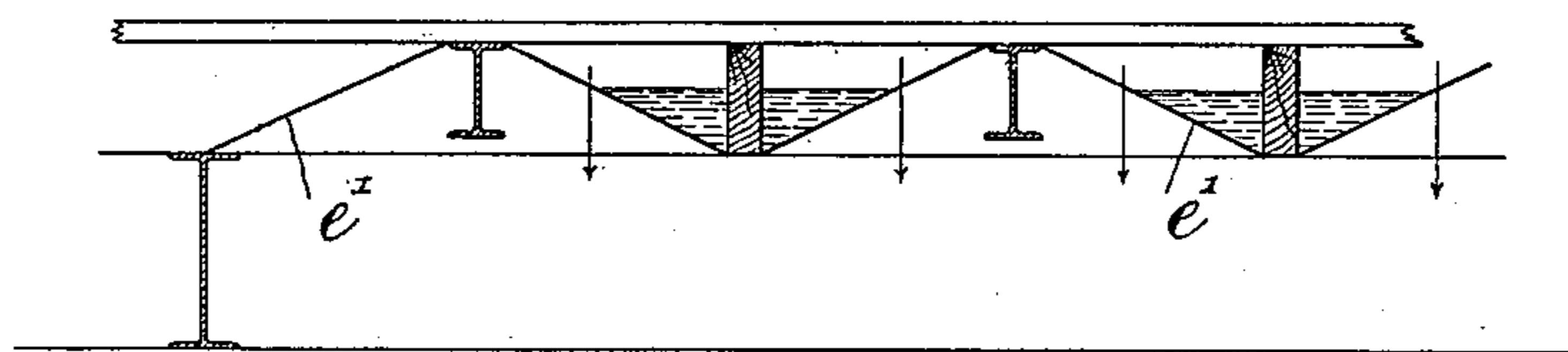
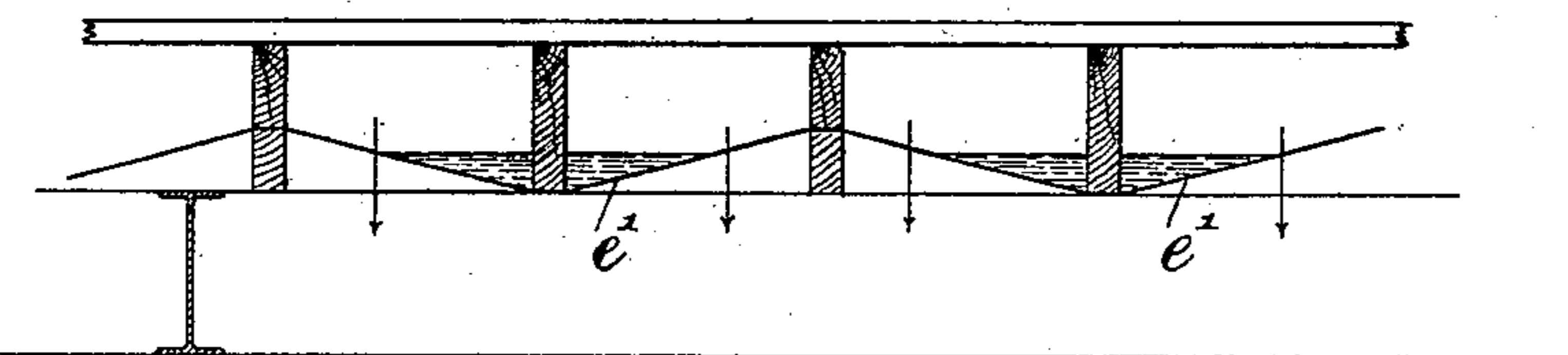


Fig. 9.



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Fig. 10.

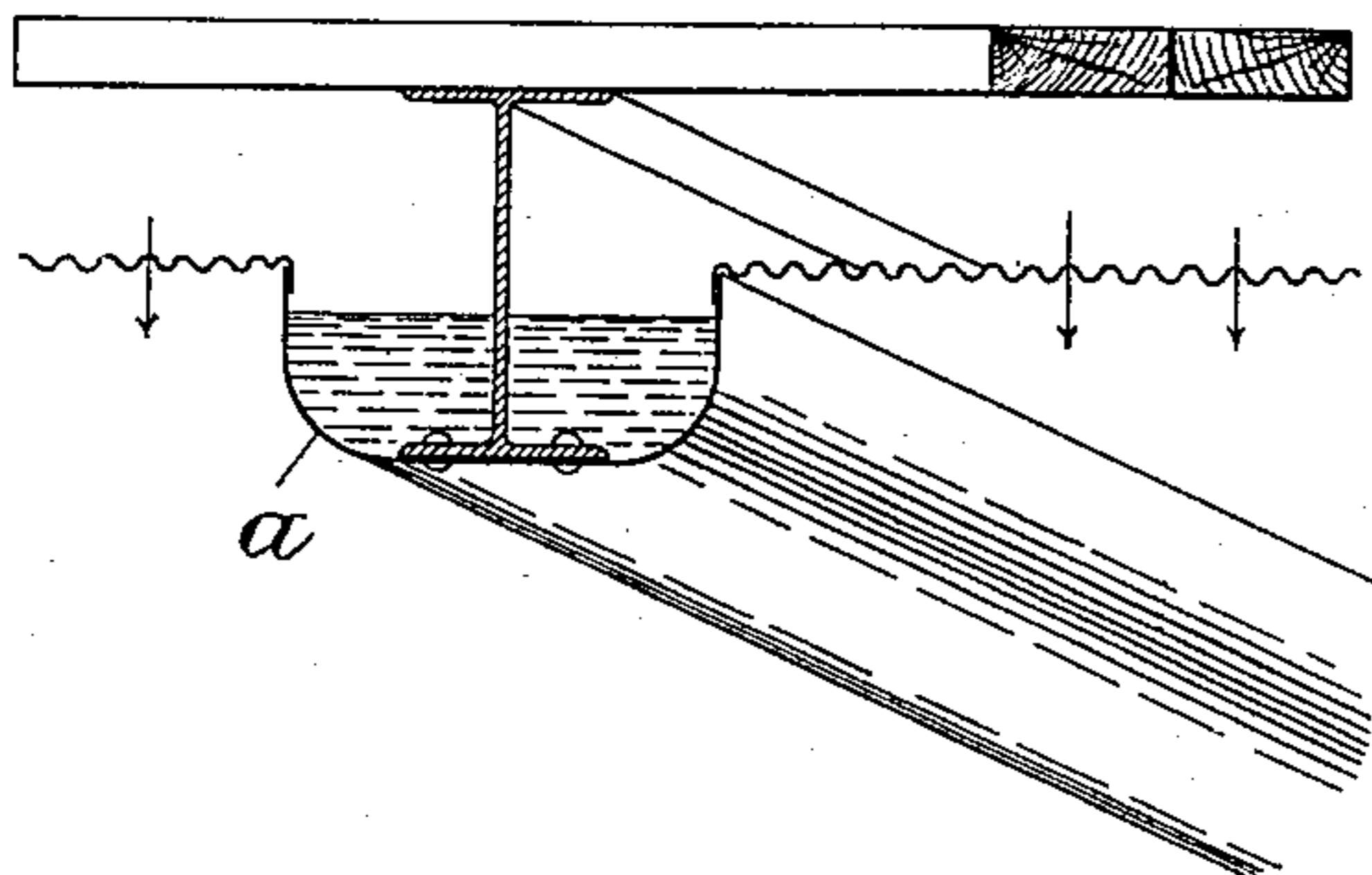


Fig. 11.

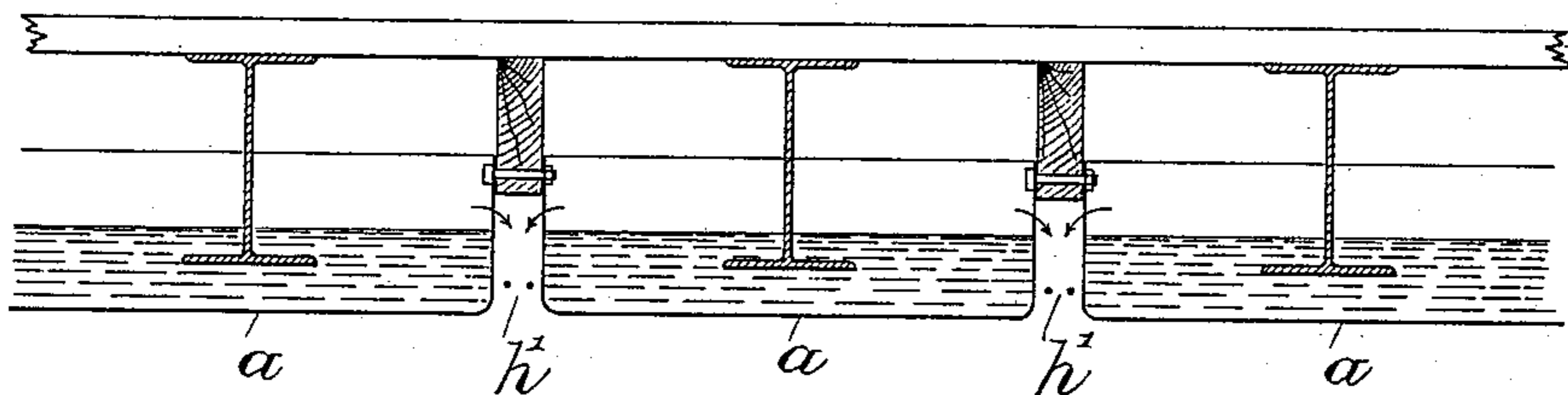


Fig. 12.

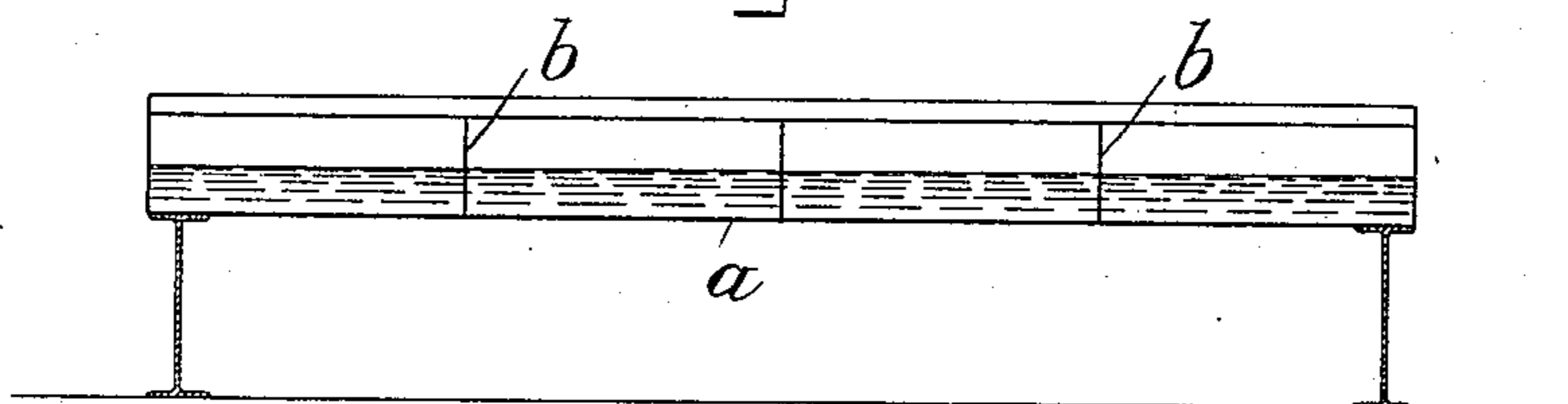
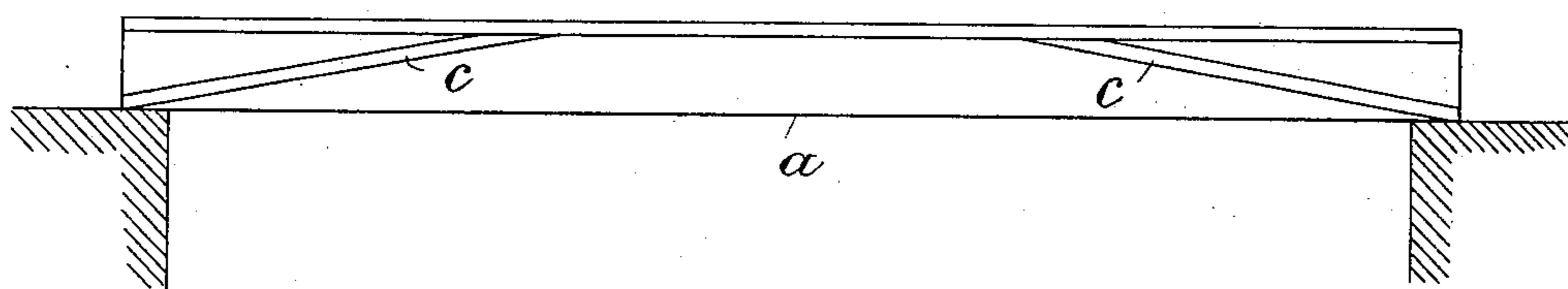


Fig. 13.



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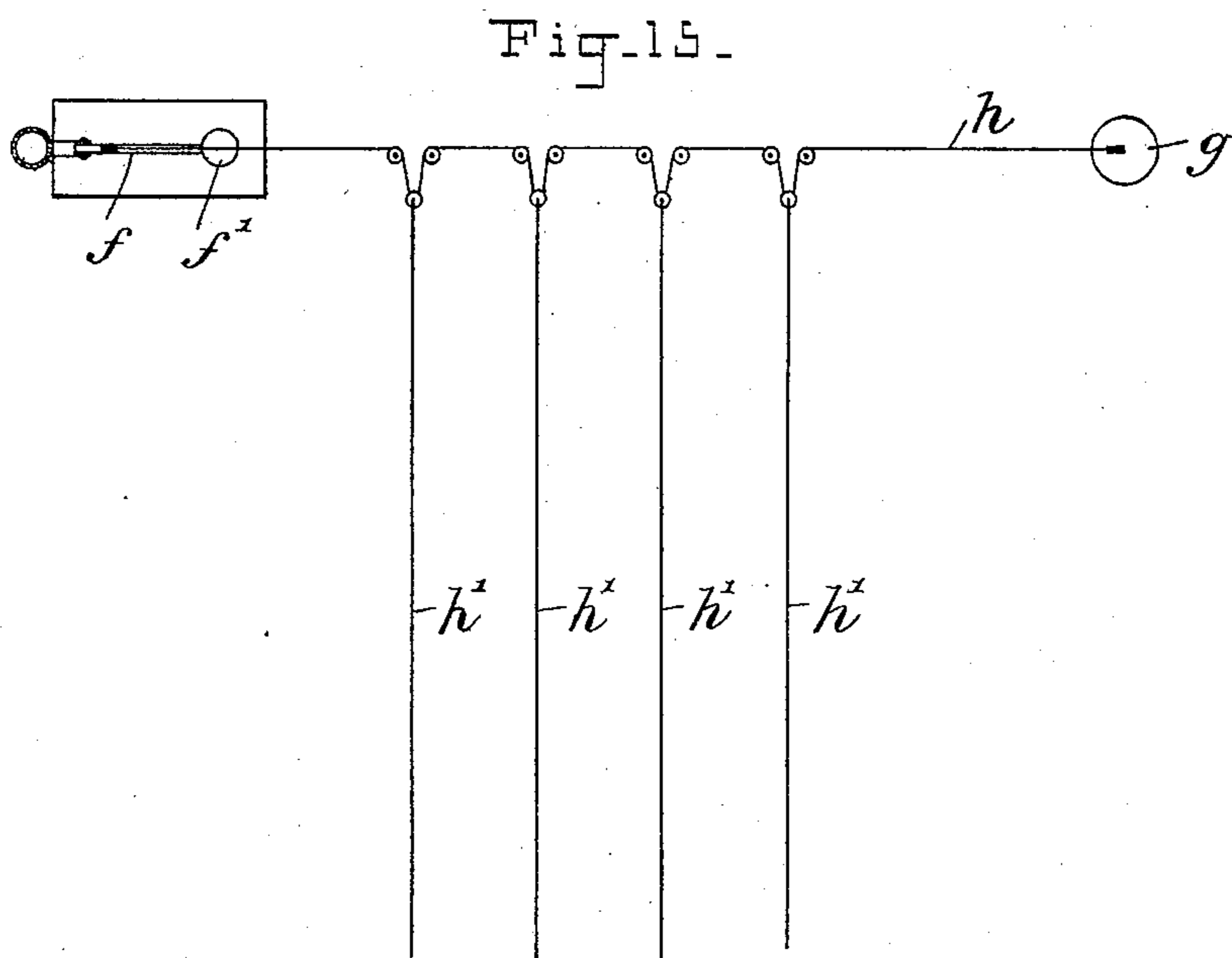
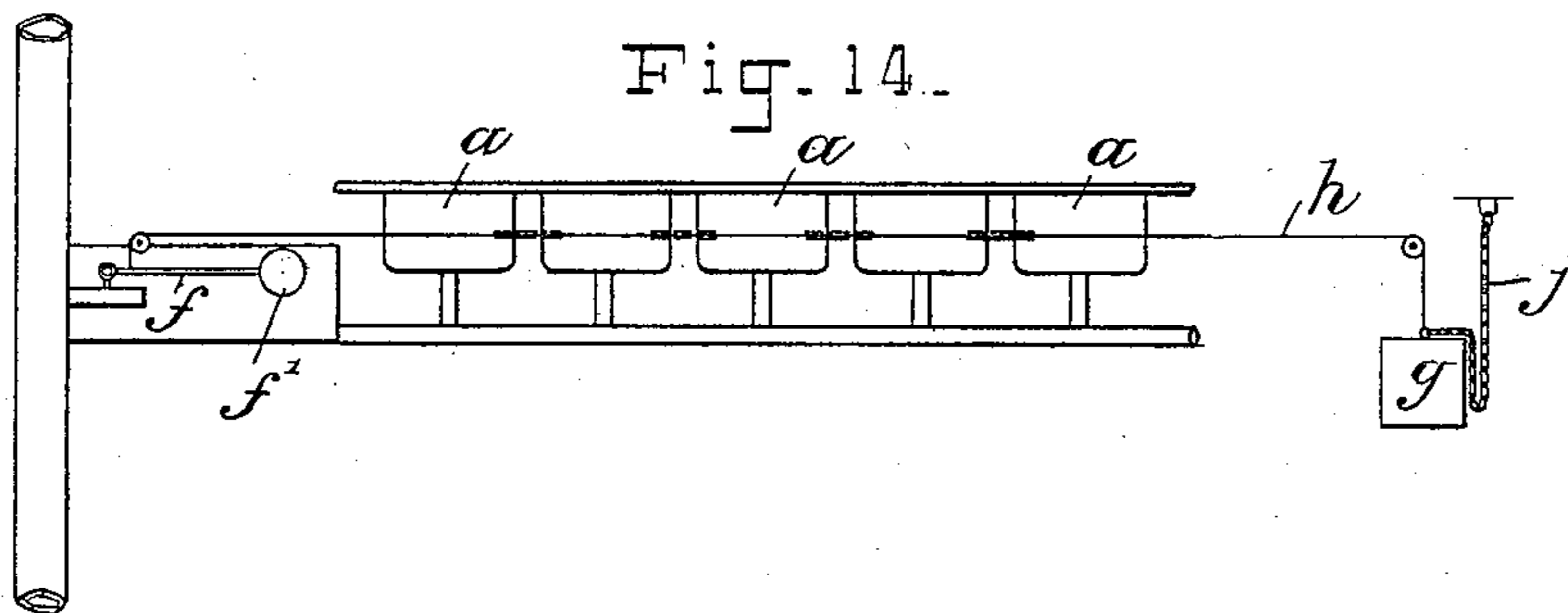
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(No Model.)

3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

EDWARD LLOYD PEASE, OF HURWORTH MOOR, ENGLAND.

## CONSTRUCTION OF FIREPROOF FLOORING, &c.

SPECIFICATION forming part of Letters Patent No. 614,754, dated November 22, 1898.

Application filed June 7, 1898. Serial No. 682,854. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD LLOYD PEASE, a subject of the Queen of Great Britain and Ireland, residing at Hurworth Moor, in the county of Durham, England, have invented certain new and useful Improvements in the Construction of Fireproof Flooring and Like Structural Arrangements; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to fireproof flooring and the like structural arrangements in which a system of troughing adapted to hold water is incorporated with other structural elements, the combination affording the requisite strength and rigidity, as hereinafter described.

The object of this invention is to construct floors, flat roofs, and the like structures on a practically fireproof principle by making provision for troughing or pooling water within the structural elements of the floor and in such a way that the water protects the floor from the effects of heat or is generated into steam, which issues through holes and perforations, as from a sprinkler under pressure; but while I arrange for the retention in the troughs of a certain supply of water to insure the indestructibility of the floor I can, if desired, arrange that the water-level of the supply shall be above that of the perforations, so that water may be discharged therefrom.

My present invention is more especially adapted to flooring of the kind described in the specification of the Letters Patent granted to me on May 31, 1895, and numbered 10,783, as shown in Figs. 15 to 21, inclusive, of the drawings, but is also adapted to other constructions of flooring, as will be hereinafter explained.

In carrying out my invention I provide in connection with my system of trough-flooring provision for charging the troughs with water, preferably through an inlet-valve, the lever of which is held in the shut-off position by a cord or lead line of material which would be easily consumed in case of fire, so that a continuous supply of water is automatically

charged into the flooring when required. The troughs are provided along their sides with holes or perforations; below the level of which the said troughs are water-tight, so that a limited supply of water is troughed or pooled in the flooring and when heated is driven out into the space below in the form of vapor.

To this end I adopt the constructions represented in the accompanying drawings, which show the embodiment of my invention in a variety of forms, to which might be added others, those selected being intended to illustrate representative modifications for the various conditions which have to be complied with in floor and flat-roof construction of the ordinary or more usual kind.

In the drawings like letters of reference indicate like or corresponding parts in all the figures.

Figures 1 and 2 are corresponding sectional views taken transversely and longitudinally, respectively, to the floor-planking, with the construction adapted to floors of a narrow span, the beams or joists *a a* forming shallow troughs capable of holding water. These beams are preferably stiffened by any number of partitions *b*, made of wood, with a hole bored through each to maintain a continuous communication from one compartment to another along the trough. Figs. 3 and 4 are similar illustrations of the construction as adapted to floors of greater span, the hollow beam or joist *a* being of a truncated form of an inverted triangle, which is preferable to the circular form as giving greater depth for the same width of material from which it is made. The strength of the hollow beams of this form is further increased, if required, by internal struts, such as *c* in Fig. 4. In Fig. 5 the beams take the open tubular form and are partially embedded in cement or concrete, the lower part of each beam being kept open to form a trough for the reception of water, as shown in a transverse sectional view, to which end boards *d* are employed to support the cement or concrete until it becomes hard set. In Fig. 6 a recognized form of concrete floor, as shown in transverse section, is similarly rendered fireproof by combining therewith corrugated plating *e*, in the concavities

of which water is pooled, while the convexities are perforated for the expulsion of water or steam. Fig. 7 illustrates a precisely similar combination of corrugated plating, with  
 5 a recognized form of timber floor rendered fireproof in the manner described with reference to Fig. 6. Figs. 8 and 9 illustrate, in similar transverse sectional views, light and cheap constructions of flooring, in which  
 10 sheets  $e'$  are set diagonally or thereabouts to the main beams in a manner which contributes strength to the floor, while forming troughs for pooling water. Other modes of combining with flooring of ordinary beam and  
 15 boarding construction means for pooling water are illustrated in transverse sectional views in Figs. 10 and 11. In floors where the steel joists are not used the troughs have diaphragm-stiffeners  $b$ , as shown in Fig. 12,  
 20 in addition to which struts may be used, as shown in Fig. 13.

It must be understood that in all the modifications as above described it is essential that provision be made not only for supplying and pooling the water, but also for discharging it into the room, space, or compartment below the floor or roof in case of fire. This is effected in all cases by perforations in the trough or plating, as the case may be,  
 30 above the normal line of water-level, so that the water issues therefrom as water under pressure or as steam or vapor in such quantity and effect as to extinguish any fire breaking out beneath a floor or ceiling so constructed. In combination with this and in  
 35 order to set up and maintain a continuous supply of water into the system of troughing, as hereinbefore described, I avail myself of any convenient means, such as an inlet-valve, as shown in Figs. 2 and 14, the lever of which  
 40 is overbalanced by a ball  $f'$ , the arrangement being set to a constant tendency to open the valve and admit an inrush of water. This tendency is overpowered by a weight  $g$ , suspended from a cord or lead line  $h$ , which  
 45 holds up the lever  $f$  and keeps the valve closed. This cord consists of material which would be easily consumed in case of fire, so that the lever could then be overpowered by  
 50 the ball  $f'$  and the inflow of water would take place.

In order to insure the proper action of the ball-and-lever arrangement for turning on the water, I provide a system of cording trained  
 55 around pulleys in the manner as shown in Figs. 14 and 15, in which Fig. 14 is a side elevation, and Fig. 15 an incomplete plan, of what is suitable in this respect. Figs. 14 and 15 are intended more especially to show a  
 60 combination of such cords or lead lines systematically arranged with a view of securing the inflow of water from the destruction or severance of any one of them. Taking  $h$  as the main cord from the ball-lever  $f$  to the  
 65 weight  $g$  it will be seen that if the cord  $h$  snapped altogether this weight  $g$  would fall,

and if the cord  $h$  was only temporarily relaxed the weight would immediately set up the tensile strain, as before, and close the valve:  $h'$  are cords taken in a crosswise direction to  
 70 their several points of connection relatively to cord  $h$ , which is trained around pulleys, forming a series of loops or bights, each one of which is relaxed when the particular cord  
 75  $h'$  attached to it gives way. The cord  $h$  is then relaxed and the weight  $g$  drops; but in order to prevent this weight from again closing the valve I provide a check-chain  $j$ , which  
 80 takes the weight  $g$  when it drops and prevents all further strain on the rope or cord  $h$ , which would close the valve.

It will be observed from the above description that the construction of the flooring, in respect to the requisite strength and rigidity, is not material to my invention so long as  
 85 the structural arrangement thereof admits of water being troughed or pooled therein, whether from a continuous or automatic supply or permanently, and so long as the water so troughed or pooled below an overflow level,  
 90 which, if exceeded, forms an outlet for water, is exposed to heat in case of fire, as a means of protection for the exposed elements of the floor, and is driven forth as an effectual fire-extinguisher in the form of vapor when the  
 95 structural elements in contact with the water reach a very high temperature.

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

1. In the construction of floors, roofs and the like, the combination with fireproof water-troughing formed beneath said floors or roofs and provided with overflow-orifices communicating with the outside, said troughs  
 100 being normally partly filled with water, a weighted valve controlling the flow of water into said troughing, and a fusible cord secured to the weight-arm of said valve and normally acting to keep the valve closed and by its rupture to open the said valve, substantially as described.

2. In the construction of floors, roofs and the like, the combination with hollow water-trough beams normally partly filled with water and provided with orifices along their sides  
 115 above the normal water-line for the escape of the water in case of fire, substantially as described.

3. In the construction of floors, roofs and the like, the combination with hollow water-trough beams normally partly filled with water, and provided with orifices along their sides above the normal water-line for the escape of the water, and means for admitting a continuous supply of water into said troughing  
 120 in case of fire, substantially as described.

4. In the construction of floors, roofs and the like, the combination with fireproof water-trough beams lying beneath said floors or  
 125 roofs, the troughing being normally partly filled with water and provided with overflow-

5 orifices above the normal water-line for the water to escape through in case of fire, a weighted valve controlling the flow of water into said troughing, a main fusible cord secured to the weight-arm of said valve and passing over a series of pulleys and weighted at its free end, and a series of lateral cords connected to said main cord and forming a

series of loops in said main cord between said pulleys, substantially as described. 10

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD LLOYD PEASE.

Witnesses:

GEORGE JAMES CLARKSON,  
EDWARD THOMAS ELCOAT.