

(No Model.)

F. B. GILBRETH.
WATERPROOF CELLAR.

No. 539,259.

Patented May 14, 1895.

Fig. 1.

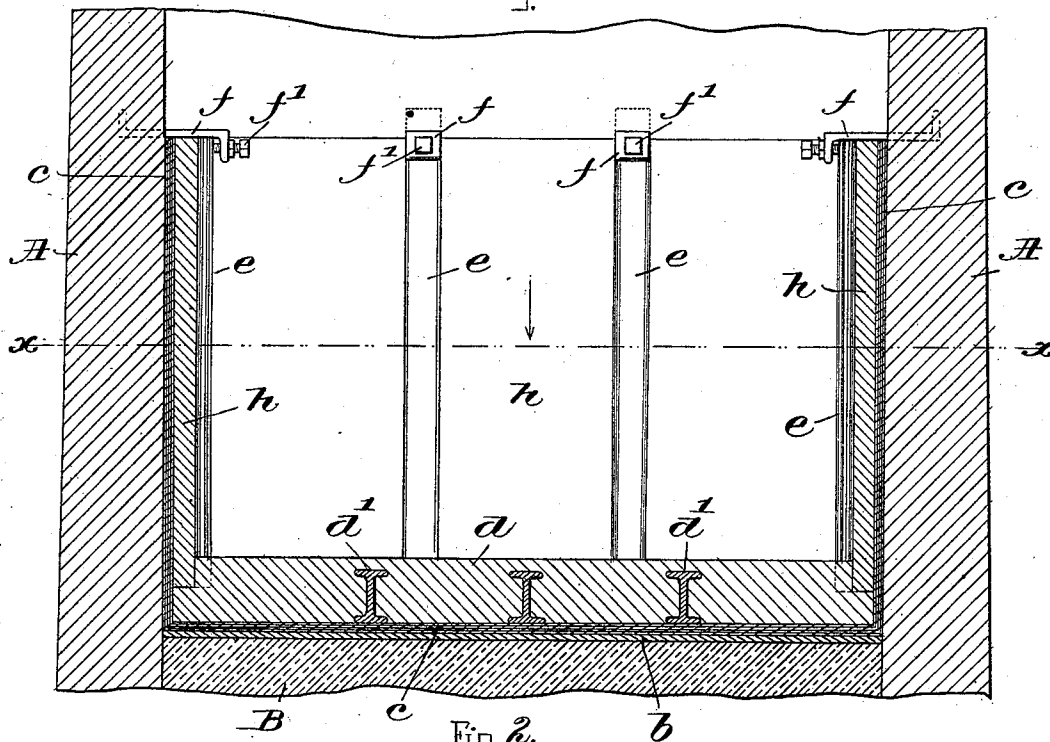
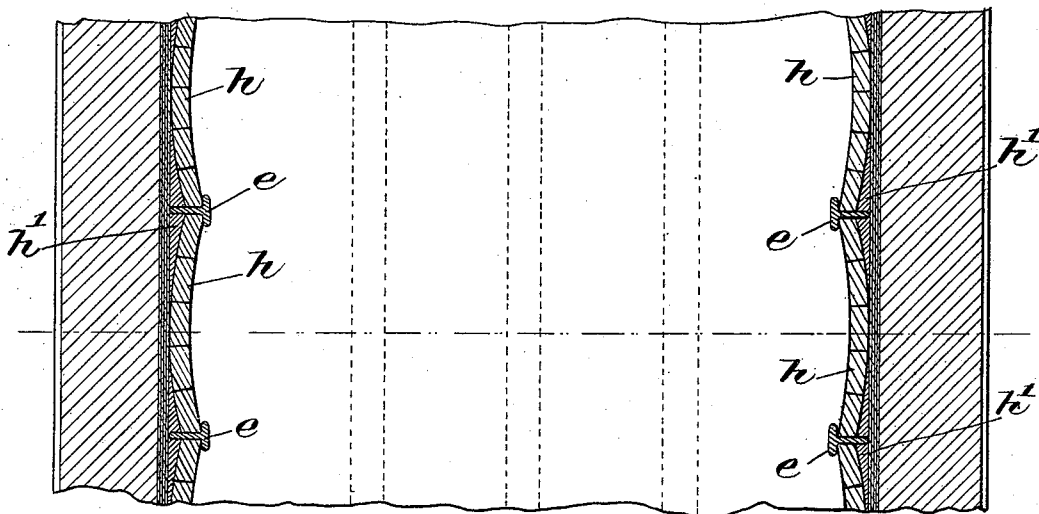


Fig. 2.



Witnesses.

Edward F. Allen.

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UNITED STATES PATENT OFFICE.

FRANK B. GILBRETH, OF BROOKLINE, MASSACHUSETTS.

WATERPROOF CELLAR.

SPECIFICATION forming part of Letters Patent No. 539,259, dated May 14, 1895.

Application filed November 26, 1894. Serial No. 529,991. (No model.)

To all whom it may concern:

Be it known that I, FRANK B. GILBRETH, of Brookline, county of Norfolk, State of Massachusetts, have invented an Improvement in
5 Waterproof Cellars, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to waterproof cellars, the object of the invention being to provide a construction, which will render a cellar or basement waterproof without consuming an undesirable amount of the cellar space within the main or inclosing walls thereof, and with
15 less constructional material than is now required.

In accordance with my invention the interior surface of the inclosing walls of the cellar or basement is lined with one or more layers or thicknesses of a water-resisting substance such, for instance, as tarred paper, the same being carried across and upon the surface of the cellar bottom, the joints between the strips of the several layers being broken
25 to provide a substantially waterproof lining for the cellar. To support or hold the waterproof lining against the pressure of water in the ground, outside the cellar, I cover the water-resisting substance upon the cellar bottom
30 with a surface coating of concrete, and in or to this concrete I embed or otherwise suitably fix the bottoms of a plurality of supports, preferably metallic railroad rails or beams, which rest in contact with and support the water-resisting substance, the upper ends of said supports being suitably preferably adjustably secured, to the inclosing walls. Between these supports I arrange a pressure resisting wall preferably a series of arches, of brick, tile, concrete or other suitable material, which, with the thick coating of concrete upon the bottom of the cellar, effectually prevent the outside water-pressure from, in any way, disturbing or breaking the waterproof lining of the cellar.

In the drawings, Figure 1 illustrates, in vertical section, one manner of waterproofing cellars in accordance with my invention; and Fig. 2, a horizontal section of the same, taken on the dotted line *x x*.

In the embodiment of my invention shown in the drawings, A, A, represent in section, two of the inclosing walls of a cellar or base-

ment, and B the gravel or other natural bottom of the cellar. To water-proof this cellar in accordance with my present invention, I first preferably lay upon the rough bottom B
55 a layer of boards *b*, to provide a smooth surface on which may be laid the one or more thicknesses *c* of water-resisting substance, preferably tarred paper, the same being carried up the side walls of the cellar against the inner faces thereof, as shown. This waterproof substance, when in the form of strips of paper, is preferably laid with broken joints, each layer being smeared with pitch or other
65 suitable substance before the next layer is applied, so that when the several thicknesses are in position a substantially water-tight cellar lining is obtained, this lining at the side being carried above the highest level of the water outside the cellar and seeking at any time to effect an entrance. While the lining itself may be water-tight, yet it is usually incapable of resisting outside pressure to any considerable extent. To support this lining
75 against outside pressure, I have, in the construction shown, first laid upon the bottom portion of the lining, a thick coating *d* of concrete, which may or may not be stiffened at suitable points by metallic stiffeners or girders *d'*.

Around the sides of the cellar I arrange a series of vertical or side supports *e, e*, of suitable material, shown as of metal in the form of T-iron, said supports at their lower ends
85 being suitably held as by embedding them in the concrete *d*, and resting in contact with and to support the water-resisting substance, the same at their upper ends being held in suitable manner, as by the hooks *f, f*, wedged, built in, or otherwise attached to the inclosing walls A. In the construction illustrated, these supporting hooks *f* are provided with set screws *f'*, by means of which the vertical or side supports *e* may be adjusted to maintain
95 the same always tightly against the inclosing walls. Referring to Fig. 2, between these side supports *e*, I have arranged a pressure resisting backing, preferably in the form of a series of arches *h*, shown as of brick or tile, but
100 which may be of concrete or other substance which, with the said supports, act to effectually hold the lining *c* against any outside pressure.

The great advantage accruing from the use of my invention lies in the fact that not exceeding six inches on each side of the cellar is required for the construction necessary to render the cellar waterproof, whereas in all constructions, now known to me, used for a similar purpose, one to three feet are consumed, which, in a small cellar filled with chimneys, piers, &c., renders the cellar of little use, especially when the buildings are high and of small floor area.

While I prefer to employ the stiffening girders *d'* in the cellar bottom, because it enables the concrete layer *d* to be made correspondingly thinner, yet the said girders may be omitted, and a solid bed of concrete alone depended upon to prevent the lining at the bottom of the cellar from bulging upwardly under the action of the outside pressure.

I prefer to arrange the arches *h* vertical in the manner shown, though my invention is not restricted to such arrangement nor to any particular construction of arches, for the latter may be arranged and constructed in any suitable or desired manner to effect the purpose of my invention. The supports also are best arranged as shown, although my invention is not limited to such exact arrangement or construction.

Having described my invention, and without limiting myself as to details, what I claim, and desire to secure by Letters Patent, is—

1. The herein described waterproof cellar, the same consisting of an inclosing wall; one or more layers of water-resisting substance

within the said wall and on the cellar bottom; separated supports in contact with and to hold said water-resisting substance in position against the said wall, and forming pockets between them; and independent reinforcing and pressure-resisting arches in the respective pockets, and extending between adjacent supports, whereby any single arch or portion thereof may be removed without removing the end support for an adjacent arch, and without removing the supporting arches for the water-resisting substance in adjacent pockets, substantially as described.

2. The herein described waterproof cellar, the same consisting of an inclosing wall, one or more layers of water-resisting substance at the inside of said wall and upon the cellar bottom; a plurality of metallic supporting beams supported at their ends, a pressure-resisting filling held by said supporting beams to hold the said water-resisting substance against the outside pressure of water seeking to effect entrance into the cellar, and adjusting devices for and furnishing means by which the upper ends of said supporting beams may be moved to press the arches and thereby the water-resisting substance toward the said inclosing wall, substantially as described.

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

FRANK B. GILBRETH.

Witnesses:

FREDERICK L. EMERY,
JOHN C. EDWARDS.