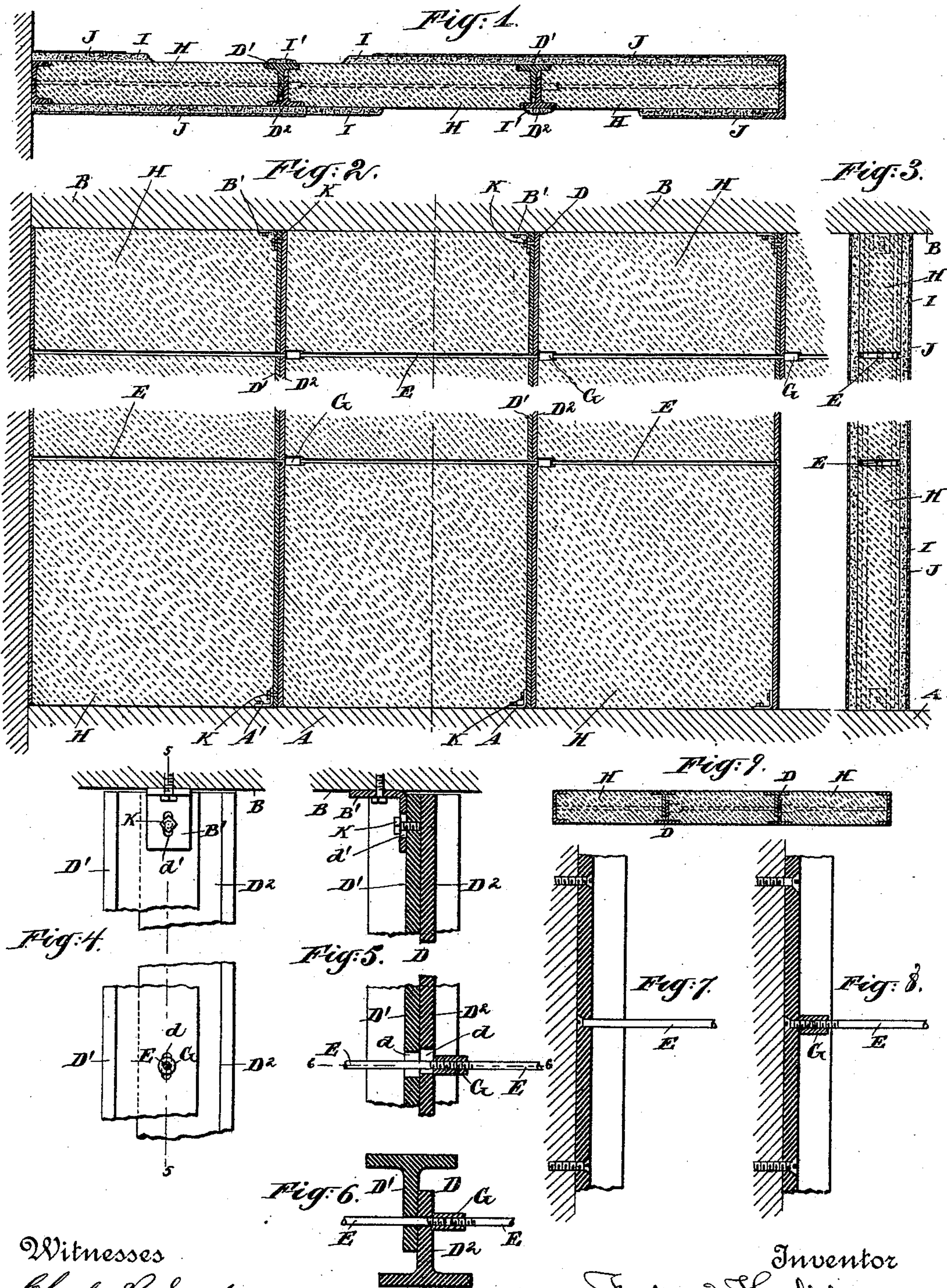


(No Model.)

F. H. MELA.
FIREPROOF PARTITION.

No. 497,383.

Patented May 16, 1893.



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FIREPROOF PARTITION.

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To all whom it may concern:

Be it known that I, FERDINAND H. MELA, builder, residing in the city and county of New York, in the State of New York, have invented a certain new and useful Improvement in the Construction of Fireproof Partitions, of which the following is a specification.

The invention consists in the construction and arrangement of the details, as will be fully set forth below and recited in the claims.

I erect in the line of the partition a series of iron T-bars, applied together in pairs, the pairs arranged a convenient distance, say about eighteen inches, apart, and I extend between these pairs horizontal cylindrical rods at the same or a little greater or less distance apart, with coupling nuts for tightening, and insert in the squares formed by these vertical and horizontal parts, corresponding rectangular slabs of porous fire-proof material, as for example, terra-cotta lumber. These slabs have a thickness corresponding to the width of the compound uprights, and are rabbeted to match into the spaces between the flanges thereof. The whole is ultimately covered and the spaces well filled with suitable mortar. I prefer coating each exposed face of the T-irons with gaged mortar in advance, afterward applying brown mortar smoothly over both faces of the entire partition and filling the spaces between the several members of the partition, and afterward completing each face with hard-finish. The horizontal metallic members are cylindrical rods, screw-threaded at each end and joined by couplings, so arranged that the couplings serve as nuts to hold each upright firmly in one direction laterally, the uprights being each held in the opposite direction by the firm support derived from the fire-proof slabs. I provide for all the differences which are liable to occur in the settling of the floors above and below.

I use the term floor in this paper to indicate not simply the upper surface of boards or other material on which we walk, but also the beams of wood or metal which support such surfacing material, and, when present, the laths and plaster, or other ceiling material for the story below.

The accompanying drawings form a part of

this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a horizontal section showing one portion of my partition in a finished and other portions in an unfinished condition. Fig. 2 is a vertical longitudinal section, showing two conditions at the right hand extremity. The uppermost shows the partition as continued past the upright and the lowermost shows it as terminating with a channel-iron in place of such upright. Fig. 3 is a vertical transverse section on the line 3—3 in Fig. 2. It will be understood that in Figs. 2 and 3 the drawings represent only the upper and lower portions of a partition, middle-height being removed and the upper and lower parts brought near together. Figs. 4 to 8 inclusive represent portions on a larger scale. Fig. 4 is a side elevation of two portions of one of the compound uprights. Fig. 5 is a corresponding vertical section on the line 5—5 in Fig. 4. Fig. 6 is a horizontal section on the line 6—6 in Fig. 5. Fig. 7 is a central vertical section through one of the channel-irons forming one of the terminal uprights. Fig. 8 is a corresponding section showing a modification in the first length of the horizontal rods. Fig. 9 is on a smaller scale. It is a horizontal section through a door or shutter formed according to my invention with a channel-iron extending around the entire edge.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

A is the floor below, provided with strongly secured metallic knees A'; and B the under side of the floor above similarly provided with knees B'. These serve as means by which to easily and strongly support the uprights.

I will designate each complete compound upright by D, using the same letter with super-numerals as D', D², for the two T-irons, which are peculiarly applied together to constitute such upright. The T-irons in each pair forming a single upright, are applied together with their plane faces outward. The webs of the irons D', D², apply against or lap upon each other, and are punched with ob-

long holes d , gaged so as to match together. The oblong form allows a slight discrepancy in the position of the holes vertically.

E E are horizontal rods of such size that they may extend through the holes d , making a tolerably close fit therein. They are screw-threaded at each end, as indicated at E', and form a continuous series extending from either end to the frame of the door, or if there be no door, extending the whole length of the partition.

G G are couplings receiving these screw-threaded ends. The parts are so arranged that each coupling applies firmly against one side of the adjacent web of one of the uprights D' or D².

H H, &c., are rectangular slabs of porous brick, terra cotta, or analogous earthy fire-proof material. The composition of these slabs is important, in order to secure mechanical strength, firmness, and fire-proof qualities, with proper lightness and reasonable cost. There are many such materials known. I prefer what is sometimes called terra-cotta lumber, but any material possessing the requisite qualities previously worked into slabs of the proper size and form, may be used. Each should be reduced a little in thickness near each upright edge in order to match approximately into the spaces provided at each side of the uprights. The upper and lower edges of these slabs may be grooved to receive the metallic horizontal parts E, but such is not generally necessary or desirable. The horizontal joint between each slab and the one above and below, requires to be open to about the thickness of one of the horizontal bars E, in order to allow the admission of a liberal quantity of mortar in applying the brown coating.

I is the general brown coating, and I' the small quantity of a proper quality of plaster known as gaged-mortar, applied in advance on the exposed faces of the uprights.

J is the hard-finish coating. It applies uniformly over the whole of one or both faces of the entire partition.

The lower end of each upright T-iron D' is secured to the corresponding knee A' by a rivet or bolt K. The holes in these parts may be cylindrical and of a diameter equal that of the rivet. The upper end of the same T-iron, is secured to the knee B' of the floor above by a bolt, similarly lettered K, which extends through an elongated hole d' , properly located to match to such rivet. The hole should be sufficiently elongated up and down to allow, say a quarter of an inch of rising or sinking of the floor B relatively to the floor A. In a tall building many of the floors serve as the floor B for the partition below, and also as the floor A for the partition above. The floor-beams of middle-height floors which are thus conditioned should have a set of knees A' on the upper edge and another set of knees B' under the lower edge.

One or both ends of the partition is formed

with a channel-iron for the upright and the rod E may be extended through and secured by a nut or head. I can, by such means, attach a complete length of rod E sufficient to extend to and a little beyond the adjacent upright, or I can attach by such means a very short length, sufficient to receive the coupling, and all the other rods in the stretch may be of a uniform length. Fig. 7 shows the first construction. Fig. 8 shows the last-named construction.

In erecting a partition a channel-iron at the commencement of one extreme end of the partition is set in place and firmly held, with the first lengths of each of the several series of horizontal rods set therein, and allowed to project in or near their proper horizontal positions. One T-iron D' alone of the next upright, which I will call the second upright, is next set in position and firmly held, taking care in bringing it into place, that the several lengths E are received in the proper holes d therein. Next the several slabs H are set in their required positions and temporarily held by any convenient means, as by a board held perpendicularly by braces against the free side supposed to be the face toward the workman. Now the other T-iron D² of this second upright is brought nearly to its required position and the short projecting ends of the several rods E are received in the holes d therein, and this iron is brought into position with its web applied fairly against the corresponding web of the T-iron D'. Now the couplings G are applied on the screw-threaded ends and turned by gas-tongs or other suitable means until they press the members D' D² of the upright firmly together, and both against the adjacent edges of the slabs H which have been set in place. Now the slabs are firmly held, their edges being confined between the proper parts of the T-iron of the uprights on each edge, and also firmly pressed edge-wise by the action of the couplings G serving as nuts. Next the entire series of uprights D' being firmly set in the correct position without their accompanying parts D², I set the several second lengths of the rods E by inserting each through its proper hole d , in the third upright. Each is slid through its proper hole in the third upright, presented to the proper coupling G and then, by gas tongs or otherwise, forcibly turned until its end is home in the coupling, its opposite end extending through the third upright in the same manner as the corresponding end of the first length extended through the second upright. Afterward the operation is a repetition of the preceding steps, that is to say, the several slabs H are brought into position and temporarily held; then the T-iron D² of the third upright is brought up and the short projecting ends of the rods E received in the holes d therein, and then this T-iron is brought into contact with its proper mate D' and the proper set of couplings G is applied on the screw-threaded ends and screwed up, to in

turn receive their proper lengths through the holes d in the next upright D' , and so on.

My horizontal rods E and couplings G perform double or triple functions:—first the rods inserted through the holes in the T-iron uprights $D' D^2$, hold the two members of each upright together while allowing for any ordinary amount of inexactness in locating the holes in such uprights; and second the rods hold the slabs in place; and further the rods and couplings hold the compound uprights against any displacement of the several sets relatively to each other.

Modifications may be made without departing from the principle or sacrificing the advantages of the invention.

Other modes of surfacing than the hard-finish J may be adopted.

Although I call this construction a partition, and have represented it as upright, it may be held in variously inclined positions. It may, with proper changes in the mode of holding the ends of the compound uprights, apply under an inclined roof, or to form the main portion or the whole of the roof. It will serve both as a fire-proof defense and a defense against the heat from sunshine. I can even construct it in horizontal positions to serve as a ceiling, or a floor. This may be especially useful where it is desirable to have a large space between the ceiling of a room and the roof rafters. In all such situations the lowermost T-iron of each compound part D should be first placed in position and the several slabs H will be reliably held by gravity until the companion part is brought into position. Thus, if D' be the lowest in the horizontal or inclined structure, the slabs H will lie against the flange thereof by gravity, and keep their positions reliably until the companion part D^2 is brought into position and secured. I can use this construction for movable parts, as fire-proof doors, and shutters for vaults, ware-houses, &c. It will be understood that for such constructions a strong frame extends around and forms the border of the door or shutter, and that my compound uprights, the horizontal bars and slabs, and the means of fastening, may be as above described, and that mortar is applied to strongly and completely fill the space within such frame.

Some of the advantages of the invention may be obtained by the use of certain portions without the whole; and parts may be substituted or added to all the parts which are here shown. Thus, in any or all forms of my invention, one or both faces of the partition may be veneered with wood, crimped sheet-iron, or any other suitable covering material of a defensive or a decorative nature.

In the upright position shown, with or without the hard-finish facing, my partition may be used in short stretches for the shafts of elevators and dumb waiters, or for vent-flues, belt shafts, hoist-ways, and wherever it is desirable to form shafts or chutes of any kind, in a building, and to render them fire-proof.

The non-conducting qualities of my construction are useful in some or all positions to defend not simply against heat but also against cold. When my structure is used as a roof or as the walls of an out-building, it can serve not only as a defense against fire and against the traversing of heat from the exterior inward but also against the escape of warmth in severe weather, or in ordinary language, against the cold and frost. It may perform this function usefully in connection with hot-houses.

I can make the holes d in one of the uprights round and just sufficient to receive the corresponding round rod E. I esteem it preferable that in all cases the holes in the other shall be long in order to allow for slight displacement of the parts vertically relatively to each other. It is practicable with sufficient care to have the holes in both the parts round. The couplings G may be of rectangular section or hexagonal section for the convenience of turning them by a wrench.

I claim as my invention—

1. A fire-proof partition having uprights formed of T-irons in pairs arranged in reverse positions, in combination with slabs of fire-proof material arranged in the spaces between with their edges matching in the recesses formed thereby and with horizontal rods E having screw-threaded ends and couplings G for holding the uprights and slabs, as herein specified.

2. A fire-proof partition having uprights formed of T-irons in pairs arranged in reverse positions, in combination with slabs of fire-proof material arranged in the spaces between with their edges matching in the recesses formed thereby and with horizontal rods E performing the double functions of holding the T-irons properly in pairs and of supporting the slabs and having screw-threaded ends and couplings G filling mortar I I' and surface material J, all arranged to serve substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

FERDINAND H. MELA.

Witnesses:

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CHARLES R. SEARLE.