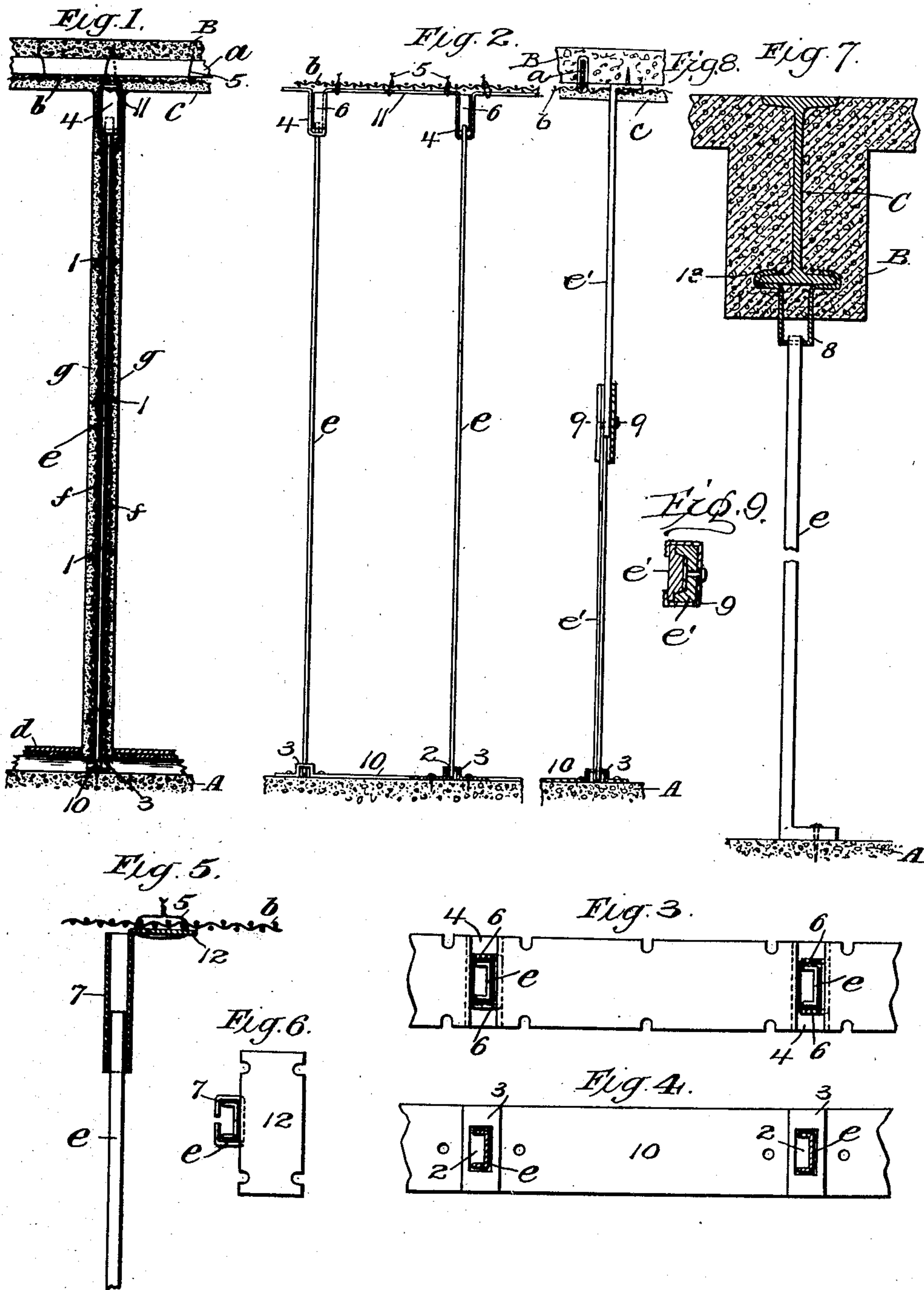


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FIREPROOF PARTITION.
APPLICATION FILED OCT. 12, 1907.

913,152.

Patented Feb. 23, 1909.



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FIREPROOF PARTITION.

No. 913,152.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed October 12, 1907. Serial No. 397,052.

To all whom it may concern:

Be it known that I, WILLIAM ORR, a citizen of the United States, residing at Trenton, county of Mercer, and State of New Jersey, have invented certain new and useful Improvements in Fireproof Partitions, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to an improved metal frame or skeleton for fire proof partitions, the object of the invention being to avoid the distortion of the metal studs by expansion in case of fire.

In fire proof buildings the partitions are usually formed of a metal framework of studding and metallic lathing, covered or filled with plaster or other plastic material. These metal studs have been attached to the floor and ceiling in such a manner that there is no provision for expansion of the stud, with the result that, in case of excessive heat from fire, the studs become distorted by expansion and throw off the plastic covering, or the whole partition is distorted so that it has to be reconstructed. These studs also, are frequently provided with projections to which the lathing is secured and which act to displace the lathing and plastic material in the expansion of the studs. The present invention avoids this difficulty by using studs of any desired cross section, which are enough shorter than the space to be filled between the floor and ceiling, or so secured in place as to allow for the expansion of the stud under the extreme heat to which it may be subjected. The studs will preferably be rolled to a uniform size throughout and so as to form a straight and comparatively smooth surface throughout their length, and the metallic lathing, when used, is so attached as to be free from the movement of the stud in expanding, so that the studs may expand independently of the plastic material and lathing.

The invention is generally applicable in fireproof building construction, and may be embodied in widely different forms, depending somewhat upon the character of the floor and ceiling constructions with which it is used.

For purpose of illustration, the invention is shown in the accompanying drawing as applied in connection with two different forms of ceiling construction, and these em-

bodiments of the invention will now be described in detail, and the features forming the invention specifically pointed out in the claims.

In the drawings—Figure 1 is a vertical section transversely to the partition, showing a completed partition embodying the invention as applied in connection with ceiling bars and a lathing and plaster ceiling. Fig. 2 is an elevation partly in section of the partition studs and their supports of Fig. 1. Fig. 3 is a plan view of the ceiling stud plates and studs shown in Figs. 1 and 2. Fig. 4 is a plan view of the floor stud plate of Figs. 1 and 2 with the studs in section. Fig. 5 is a detail view of a modified form of ceiling attachment for the stud. Fig. 6 is a plan view of the ceiling stud plate of Fig. 5. Fig. 7 is a view similar to Fig. 2, showing the invention applied with studs connected to the ceiling beams. Fig. 8 is a view similar to Fig. 2, showing a stud made in two parts with overlapping free ends for expansion movement. Fig. 9 is a horizontal section of the same on the line 9 of Fig. 8.

Referring now especially to Figs. 1 to 4, A is the fire proof floor of concrete or similar material and B a similar floor of the next story, which floor B carries the ceiling formed by the ceiling bars *a* embedded in the floor and supporting the ceiling lathing *b* and plaster *c*. The usual floor of joists and boards *d* is shown on the concrete floor A.

The partition, in the form shown, consists of the metal studs *e*, to which is laced on one or both sides by wires 1 the metallic lathing *f*, to which is applied the plaster *g* to complete the partition, the partition shown being of that class known as "solid partitions" with no central air space.

The construction thus far described is common, the studs *e* being secured in place in previous constructions so that no expansion is permitted, being abutted directly against the floor and ceiling, or otherwise having a fixed length.

Referring now to the support of the studs *e* in accordance with the present invention, provision for expansion is made at the ceiling end of the studs, the studs being held in place on the floor A, either by nailing them to the floor as usual, or as shown in Figs. 1 to 4, by inserting them in openings 2 formed in corrugations or raised portions 3 of a floor strip 10, this being a convenient and

rapid means for quickly placing and properly positioning the studs, the floor strips 10 being nailed to the floor A, as shown, or otherwise secured thereto. At the ceiling end the studs extend through openings in downwardly extending corrugations or bent portions 4 of ceiling stud plates 11, which are shown as secured in place by lacing them by wires 5 to the ceiling bars *a* and lathing *b*. These downwardly extending corrugations or portions of the plates 11 are of sufficient depth to allow for the possible expansion of the studs *e* in case of fire.

In solid partitions, it is important that the space above the studs *e* should not be filled by the plaster or other plastic material of the partition, and, in the construction shown, this is prevented by forming on the downwardly extending portions 4 of the plates 11, wings 6, which are bent around the studs *e* so as to form a sleeve inclosing the upper ends of the studs *e*, so as to leave open space for expansion.

After the studs are assembled with the plates 10, 11, as shown in Fig. 2, the lathing *f* is applied and the partition finished with plaster, as shown in Fig. 1.

In Fig. 5 there is shown a construction in which a ceiling plate 12, which may be secured to the ceiling in any suitable manner, being shown as secured to the ceiling lathing *b* by wire ties 5, carries a downwardly extending sleeve 7 which may be formed in any suitable manner, as by cutting and bending a piece of sheet metal to proper form, which sleeve 7 receives the upper end of the stud *e*, thus allowing for expansion, as in the construction shown in Figs. 1 to 4.

In Fig. 7 there is shown a construction for a partition extending in line with a ceiling beam, in which the stud is secured to the floor by nailing, as usual, but at the upper end is held in place by a sleeve 8 on a sheet metal clip 13, which is clamped on the bottom flange of the beam C, the sleeve 8 extending below the concrete B, in which the clip is embedded, so as to provide space within the sleeve below the concrete for the expansion of the stud *e*.

Other constructions embodying the invention may readily be designed by those skilled in the art, and the construction will be varied according to circumstances. In many cases suspended ceilings are used with an air space between the ceiling and concrete or other floor above, which air space may be sufficient for the expansion of the stud, as shown, for instance, in my Letters Patent No. 671,679. In such cases, the partition studs may simply run through the metal lathing or flat stud plates secured thereto, the studs expanding in the space between the ceiling and floor above. It is not essential that the studs shall be in a single piece, although this is preferable, or that the provision for ex-

pansion shall be made next the ceiling or floor. The studs may be made in two parts, one attached to the floor and the other to the ceiling, and having their adjacent ends inclosed by a sleeve with space between the ends for expansion, or with overlapping ends free to move on each other and held in place by a sleeve or slotted attachment, or other means permitting freedom of movement. Such a construction is shown in Figs. 8 and 9 in which the stud *e'* is made in two parts extending respectively from the floor and ceiling, and having overlapping ends inclosed by a sleeve 9 which may be secured to one part of the stud, as shown, and overlap the other part. In solid partitions the sleeve is preferably made of such length, as shown, as to extend beyond the ends of the studs sufficiently to form an expansion space which will not be filled by the plastic material of the partition. The stud *e'* in this construction is shown as formed of ribbed and grooved parts to strengthen the stud edgewise, but it will be understood that this is not essential to the present invention and that these studs may be of any other suitable form.

What is claimed is:—

1. A metal partition frame having vertical metal studs free to expand vertically under excessive heating in case of fire whereby distortion of the studs or injury to the partition is prevented.

2. A metal partition frame having vertical metal studs having free ends so that the studs may expand vertically under excessive heating in case of fire and having their free ends inclosed by sleeves to prevent the plastic material filling the expansion space.

3. A metal partition frame having vertical metal studs formed in a single piece extending from floor to ceiling and having their upper ends held in place by means leaving the ends free to permit the expansion of the studs under excessive heating in case of fire.

4. A metal partition frame having vertical metal studs formed in a single piece extending from floor to ceiling and having their upper ends held in downwardly extending portions of ceiling stud plates providing space and leaving the ends free for the expansion of the studs under excessive heating in case of fire.

5. The combination with a floor and ceiling, of metal studs *e* extending from floor to ceiling, ceiling stud plates 11 secured to the ceiling and having downwardly extending portions 4 for holding the upper ends of the studs *e* in place and leaving the ends free and providing space for the expansion of the studs under excessive heating in case of fire.

6. The combination with a floor and ceiling, of metal studs *e* extending from floor to ceiling, ceiling stud plates 11 secured to the ceiling and having downwardly extending

portions 4 for holding the upper ends of the studs *e* in place and providing space for the expansion of the studs under excessive heating in case of fire and the portions 4 being
5 formed to provide sleeves inclosing the studs for preventing the plastic material filling the expansion space.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

WILLIAM ORR.

Witnesses:

E. W. ARNOLD,
E. R. FELTY.