C. W. DENNY.

FIREPROOF STRUCTURE.

APPLICATION FILED OCT. 17, 1908.

930,160.

Patented Aug. 3, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

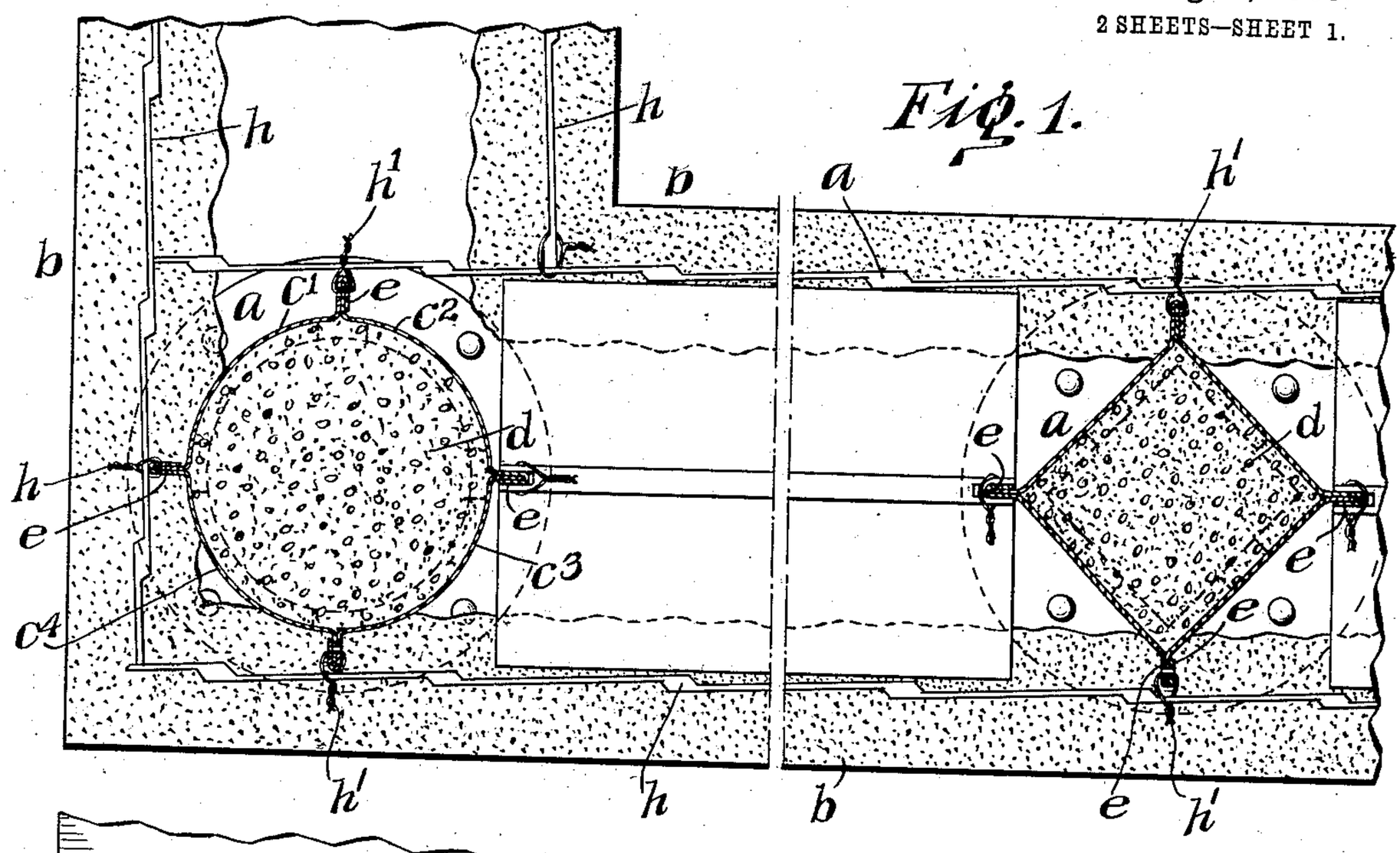
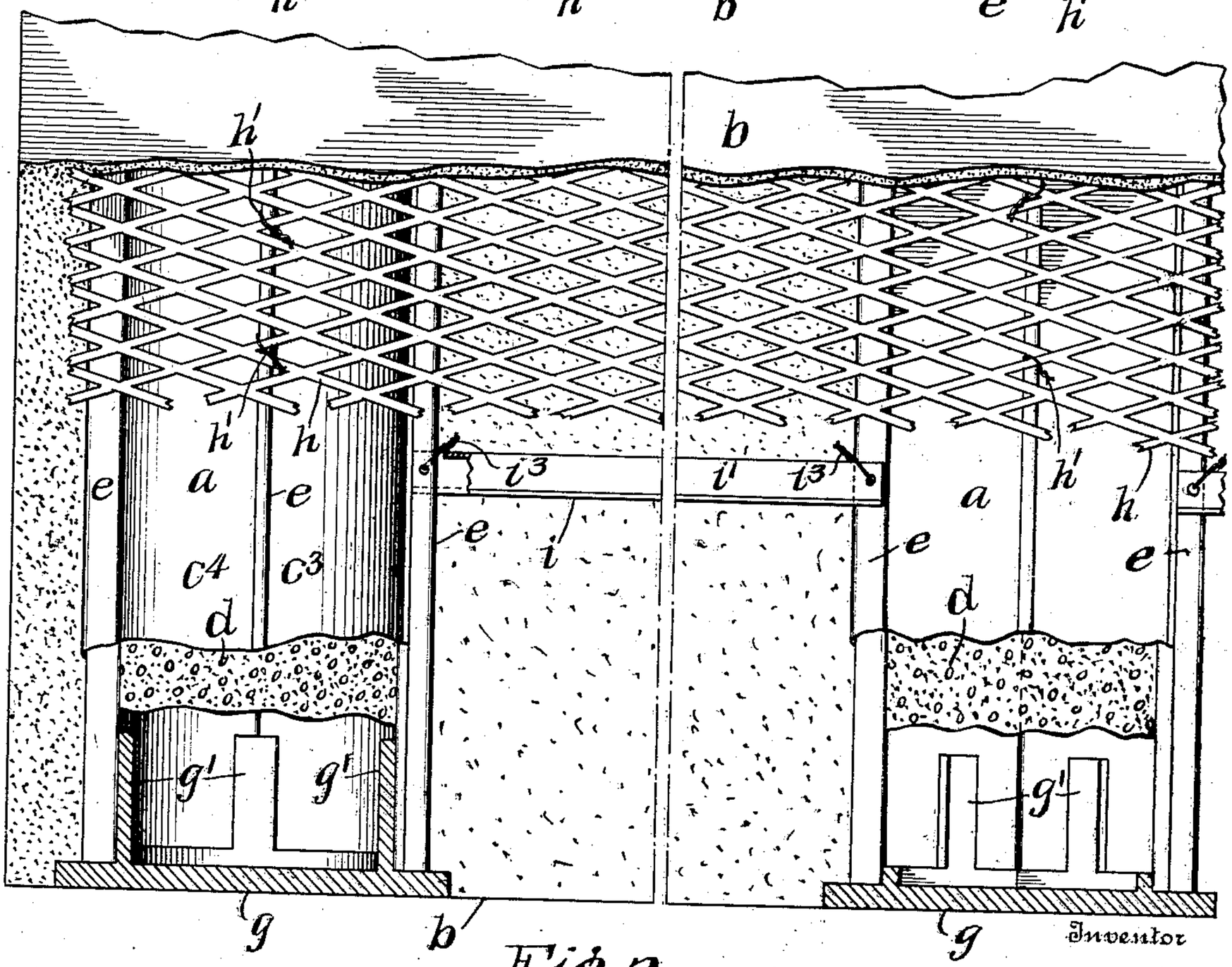


Fig. 2.



Witnesses

Daniel Webster, Jr.

A. M. Kelly.

Inventor

Charles W. Denny

By

Attorney

C. W. DENNY.

FIREPROOF STRUCTURE.

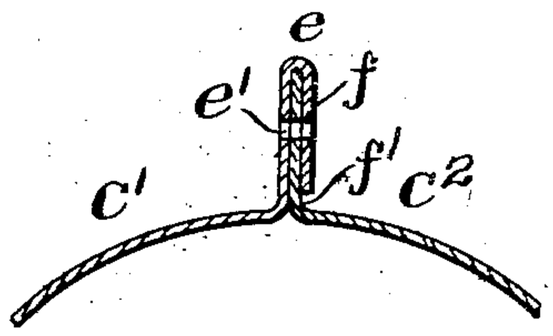
APPLICATION FILED OCT. 17, 1908.

930,160.

Patented Aug. 3, 1909.

2 SHEETS—SHEET 2.

Fig. 7.



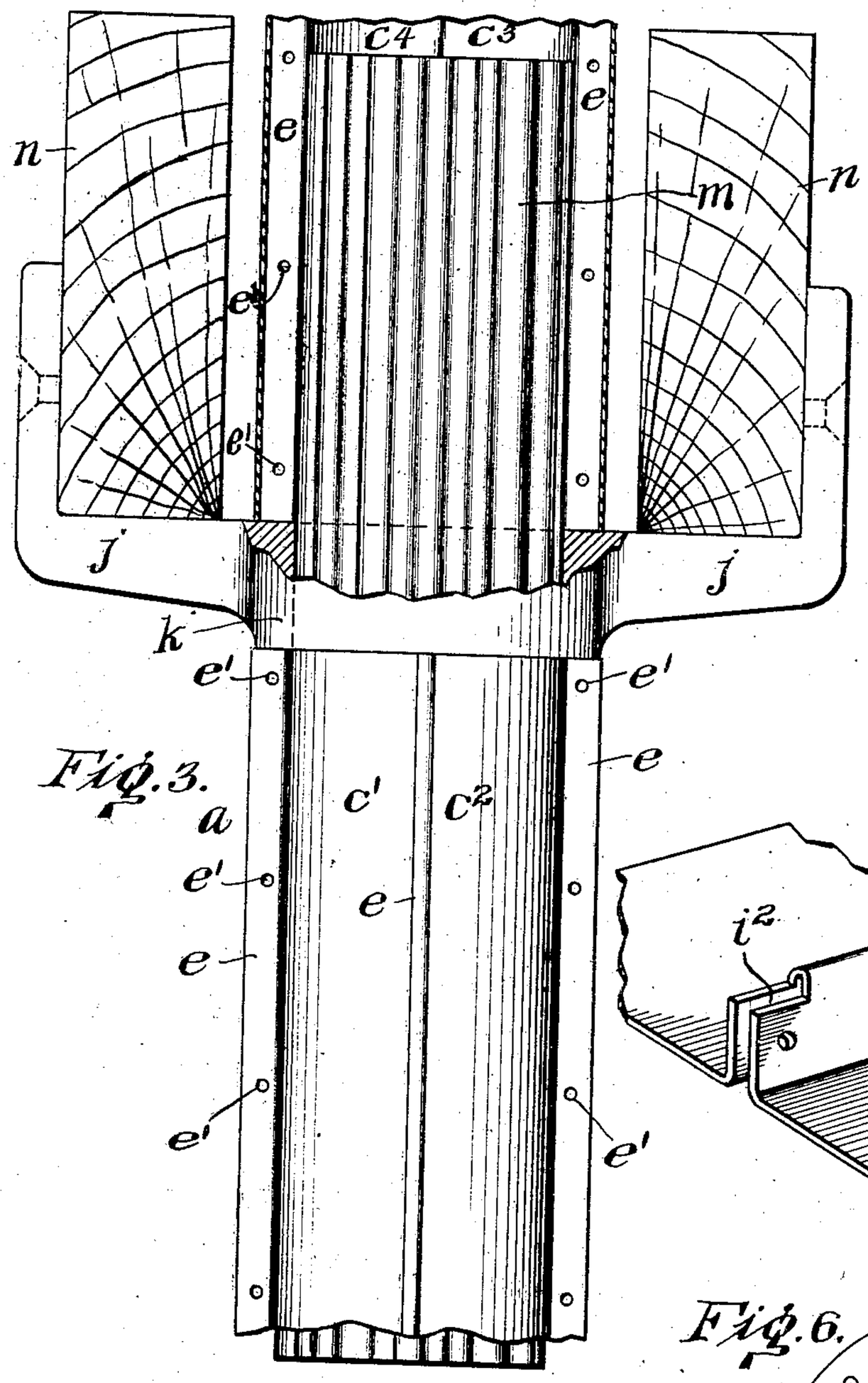


Fig. 3.

Fig. 5.

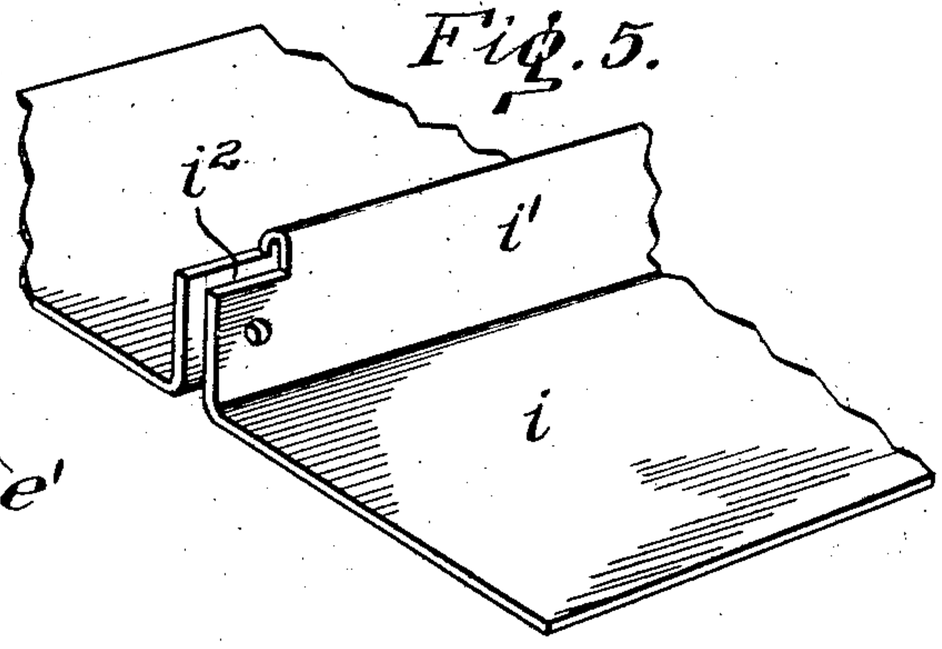


Fig. 6.

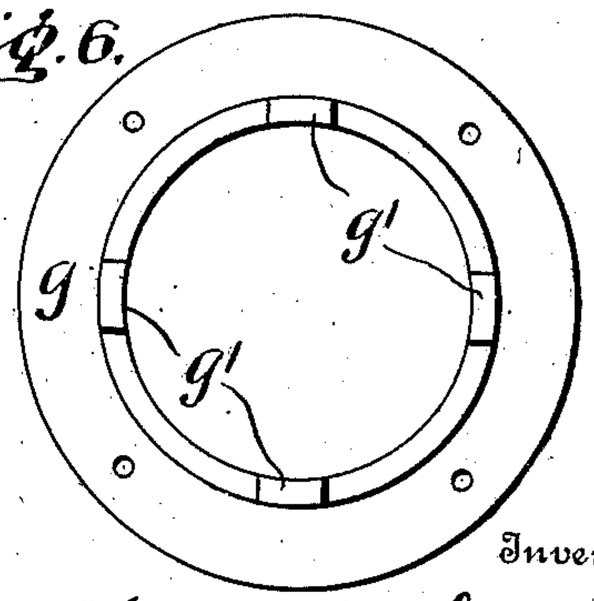
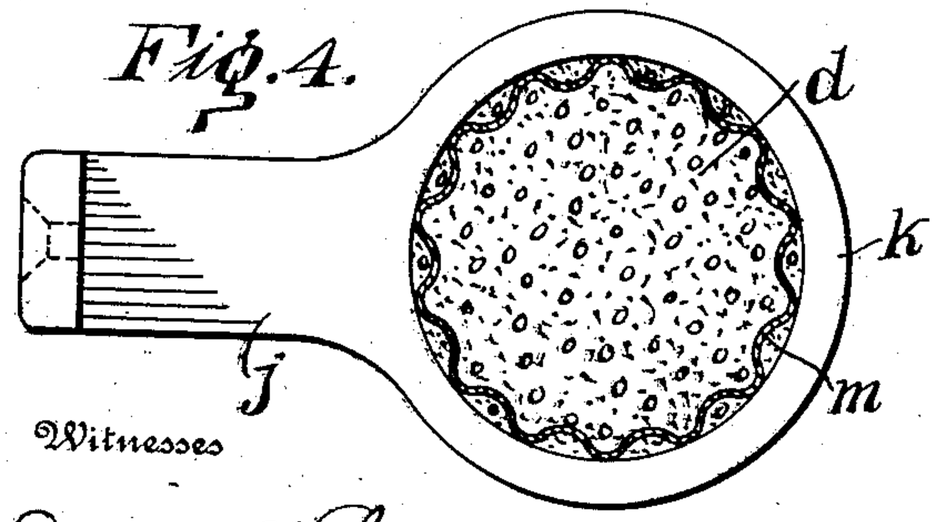


Fig. 4.



Witnesses

Daniel Webster, Jr.

A. M. Kelly.

Inventor

Charles W. Denny

By

Attorney

UNITED STATES PATENT OFFICE.

CHARLES W. DENNY, OF PHILADELPHIA, PENNSYLVANIA.

FIREPROOF STRUCTURE.

No. 930,160. Specification of Letters Patent. Patented Aug. 3, 1909.

Application filed October 17, 1908. Serial No. 458,192.

To all whom it may concern:

Be it known that I, CHARLES W. DENNY, a resident of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Fireproof Structures, of which the following is a specification.

The principal objects of my invention are: to facilitate erection, to combine strength with lightness, to increase the fire resisting qualities, and to avoid the use of centering and framework.

The structure embraces studs composed of concrete sheathed in metal and a wall or walls of metallic lathing and plaster carried by the studs.

A part of my improvements relates to the construction of the studs whereby they may be erected with facility and the metallic lathing may be easily and effectively secured in place; another part relates to means for cross bracing the studs to enable fewer studs to be used without unduly weakening the structure; another part relates to means for forming inclosed air spaces between the walls to increase the fire resisting properties, and yet another part relates to the connection of stud sections through different stories and to the support by the studs of the floor beams.

In the drawings: Figure 1 is a horizontal sectional view of a portion of a fire-proof wall embodying my invention; Fig. 2 is a side elevation of the same with part of the plaster removed from the lathing on one side; Fig. 3 is a side elevation, with part in section, of the means for connecting and supporting the studs between different floors or stories; Fig. 4 is a plan view with part in section of a modified form of the means for connecting and supporting the studs; Fig. 5 is a perspective view of a part of one of the cross braces or horizontal partitions; Fig. 6 is a plan view of one of the supporting shoes for the studs; and Fig. 7 is a horizontal sectional view enlarged of part of one of the stud-sheaths.

The wall consists primarily of vertical columns or studs *a* and a partition *b* of lathing and plaster carried by the studs on either or both sides. The studs *a*, as shown, consist of an outer tubular sheath of sheet metal and a filling *d* of concrete or equivalent material. These studs are provided with offsets to which the metallic lathing is secured. These offsets are preferably longitudinal vertical ribs *e*. I prefer to form the tubular sheaths of sections of sheet metal c', c^2, c^3, c^4 having their edges lap-seamed to form the vertical ribs *e*. This is shown in detail in Fig. 7 where the longitudinal edge *f* of one section c' is lapped over the flange f' of the next section c^2. These stud-sheaths may be of any convenient cross section. In Figs. 1 and 2 I have shown one sheath cylindrical, forming a cylindrical stud, and another sheath square, forming a square stud. The sheaths formed of the connected sections are arranged in upright positions, at such distances apart as may be necessary to give the desired strength, and are then filled with the concrete, as shown. Suitable means may be used, if required, for supporting the stud-sheaths at their ends and securing them at the top or bottom. For this purpose, I have shown the shoes *g*, adapted to be secured to the base or roof, and provided with the tongues g' extending into the end of the sheath. After the studs have been put in place the lathing *h* is fastened. This is laid vertically in sheets over the studs resting on the offsets or ribs *e*, to which the sheets are fastened in any convenient manner, as by wires h'. To facilitate the fastening of the lathing after the studs have been erected, the ribs *e* are preferably furnished with a series of holes e'.

i are metal pieces arranged between the walls *b b* and extending from stud to stud. These pieces both serve to brace the studs laterally, and thus enable them to be placed farther apart than would otherwise be possible, and also, when constructed as partitions, and particularly when arranged one above another within the space between the walls *b b*, to form dead air spaces and thus increase the fire resisting properties of the entire structure. For convenience I prefer to form the partition *i* of sheet metal bent at the middle into a rib i', which is notched or split at the ends, as at i^2, to engage the intermediate ribs *e e* of the studs to which such split ends are secured, as by the wires i^3. Providing the stud-sheaths with four ribs *e* at 90° from one another—more or less—both enables the lathing to be attached at right angles to form a corner, as shown in Fig. 1, and also provides the means for securing the cross-braces or partitions *i* between adjacent studs.

In Figs. 3 and 4 I have shown means for connecting the stud-sheaths together between adjacent stories to form a continuous

stud and for supporting the floor beams on the studs. *j* is a bracket to which the floor beams *n* are secured. This bracket carries a yoke *k* which embraces a tubular sleeve *m* extending into the ends of the adjacent stud-sheaths. The sleeve *m* is preferably corrugated as shown to form a spring surface which will retain the sleeve in position in the yoke *k* and sheath ends, particularly before the concrete is introduced. In Fig. 3 the bracket *j* is of double form having arms on both sides of the yoke *k* to support floor beams on both sides of the stud; in Fig. 4 the bracket has but a single arm. The yoke *k* lies between the extremities of the sections of stud-sheathing which abut against it and support it as is shown in Fig. 3. The ribs *e* which thus abut against the yoke provide a strong support.

What I claim is as follows:

1. In a fire-proof structure, the combination of a stud consisting of hollow tubular sheathing of sheet metal filled with concrete and provided with offsets projecting from its surface and arranged at an angle to one another and at a substantial distance apart, metallic lathing secured to said offsets and forming an angle or corner between them and extending in the opposite directions beyond said studs to form the body of the walls, and a body of plastic material carried by said lathing.

2. In a fire-proof structure, the combination of a stud consisting of hollow tubular sheathing of sheet metal filled with concrete and provided with offsets projecting from its surface and arranged at substantially right angles to one another, metallic lathing secured to said offsets and forming an angle or corner between them and extending in the opposite directions beyond said studs to form the body of the walls, and a body of plastic material carried by said lathing.

3. A stud for a fire-proof structure consisting of sections of hollow tubular sheathing, a distensible tubular sheet metal sleeve extending within the ends of adjacent sections of sheathing and uniting them together, and a filling of concrete extending continuously through said sections of sheathing and sleeve and uniting the portions of concrete in said sections of sheathing.

4. A stud for a fireproof structure consisting of sections of hollow tubular sheathing, a longitudinally corrugated tubular sheet metal sleeve extending within the ends of adjacent sections of sheathing and uniting them together, and a filling of concrete extending through said sections of sheathing and sleeve.

5. In a fireproof structure the combination of a stud composed of sections of hollow tubular sheathing, a distensible tubular sheet metal sleeve extending within the ends of adjacent sections of sheathing and uniting them together, a filling of concrete extending continuously through said sections of sheathing and the sleeve and uniting the portions of concrete in said sections of sheathing, and a yoke separate from but embracing said tubular sleeve and located between the adjacent ends of the sections of sheathing.

6. In a fireproof structure the combination of a stud composed of sections of hollow tubular sheathing having longitudinal projecting ribs, a distensible tubular sheet metal sleeve extending within the ends of adjacent sections of sheathing and uniting them together and a filling of concrete extending continuously through said sections of sheathing and the sleeve and uniting the portions of concrete in said sections of sheathing, and a yoke separate from but embracing said tubular sleeve and located between the adjacent ends of the sections of sheathing with the extremities of the ribs abutting against said yoke.

7. In a fireproof structure the combination of a stud composed of sections of hollow tubular sheathing, a distensible tubular sheet metal sleeve extending within the ends of adjacent sections of sheathing and uniting them together and a filling of concrete extending continuously through said sections of sheathing and the sleeve and uniting the portions of concrete in said sections of sheathing, and a yoke separate from but embracing said tubular sleeve and located between the adjacent ends of the sections of sheathing and provided with a supporting arm or bracket.

8. In a fireproof structure the combination of a stud composed of sections of hollow tubular sheathing, a distensible tubular sheet metal sleeve extending within the ends of adjacent sections of sheathing and uniting them together and a filling of concrete extending continuously through said sections of sheathing and the sleeve and uniting the portions of concrete in said sections of sheathing, and a yoke separate from but embracing said tubular sleeve and located between the adjacent ends of the sections of sheathing and provided with a supporting arm or bracket on each side.

9. A fireproof structure consisting of studs composed of concrete columns sheathed in metal, inner and outer walls of metallic lathing and plaster carried by said studs, and horizontal partitions bridging the space between the walls and extending from stud to stud, forming inclosed dead air spaces.

10. In a fire-proof structure, the combination of studs consisting of hollow-tubular sheathing of sheet metal filled with concrete and provided with offsets projecting from their surface, one of said studs having offsets arranged at an angle to one another, metallic lathing secured to said offsets and extending from stud to stud, said metallic lathing forming an angle or corner in the space between

the offsets located at an angle with reference to one another on one of said studs, and a body of plastic material carried by said lathing.

11. A fire proof structure consisting of studs composed of concrete columns sheathed in metal, inner and outer walls of metallic lathing and plaster carried by said studs, said studs having longitudinal ribs extending from the sheathing in the space between said walls, and metal sheets carried by said ribs bridging the space between the walls and extending from stud to stud, and forming inclosed dead air spaces.

12. A fire proof structure consisting of studs composed of concrete columns sheathed in metal, inner and outer walls of metallic lathing and plaster carried by said studs, said studs having longitudinal ribs extending from the sheathing in the space between said walls, and metal sheets carried by said ribs bridging the space between the walls and extending from stud to stud, and forming inclosed dead air spaces said metal sheets being bent into the central longitudinal ribs *i'* notched at the ends to engage the longitudinal ribs of the studs.

In testimony of which invention, I have hereunto set my hand.

CHAS. W. DENNY.

Witnesses:
ERNEST HOWARD HUNTER,
R. M. KELLY.