S. J. HAYDE.

FIREPROOF CONSTRUCTION.

APPLICATION FILED JAN. 20, 1906.

1,136,874.

Patented Apr. 20, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

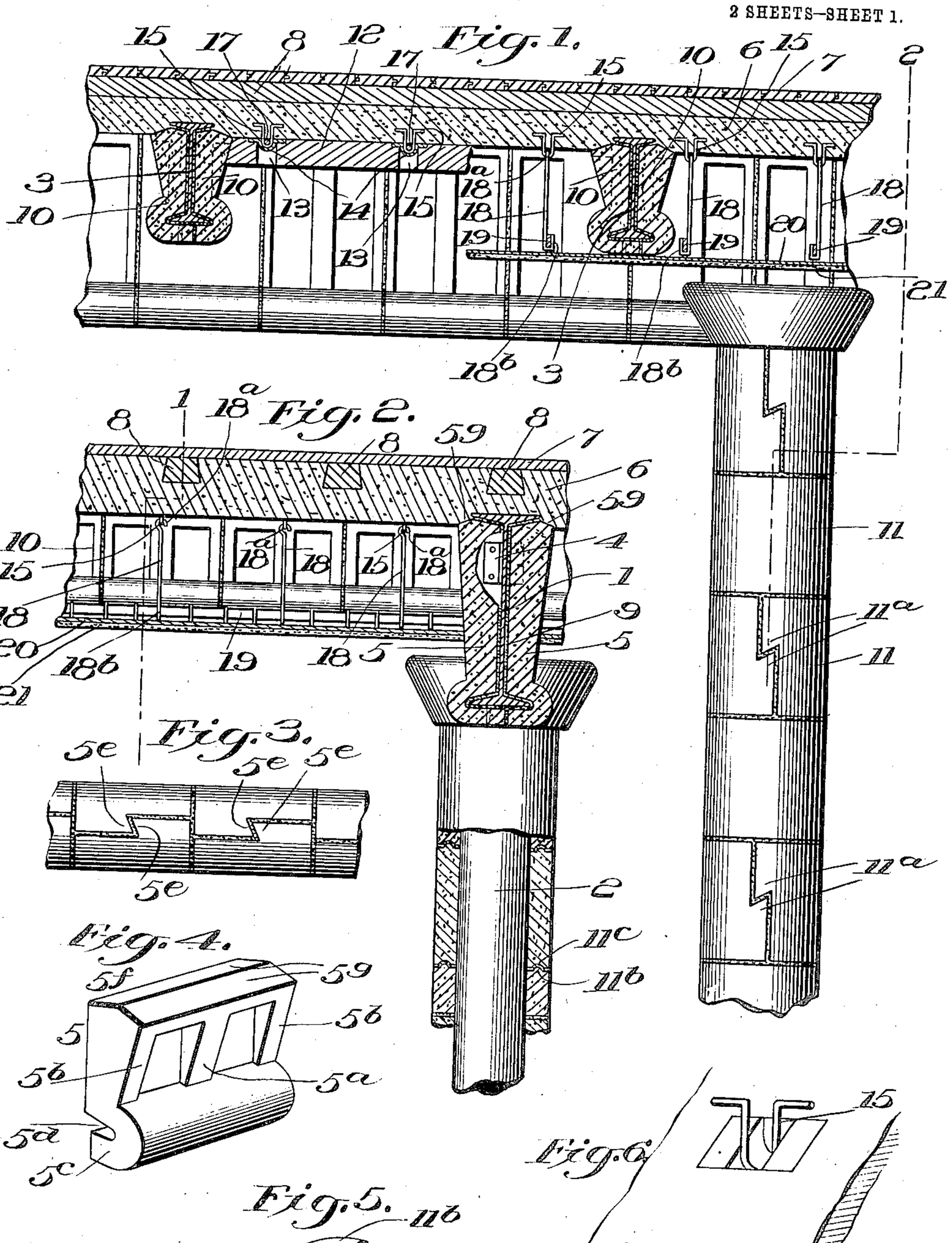


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

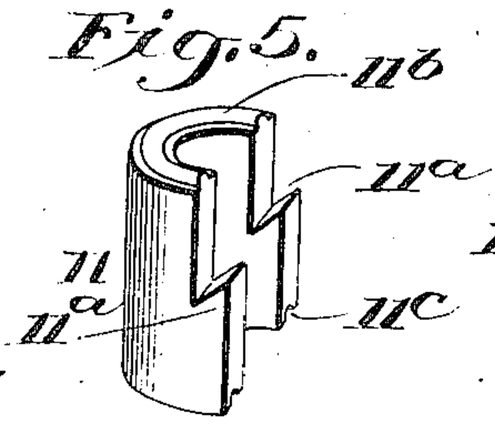


Fig. 6.

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2 SHEETS—SHEET 2.

Fig. 7.

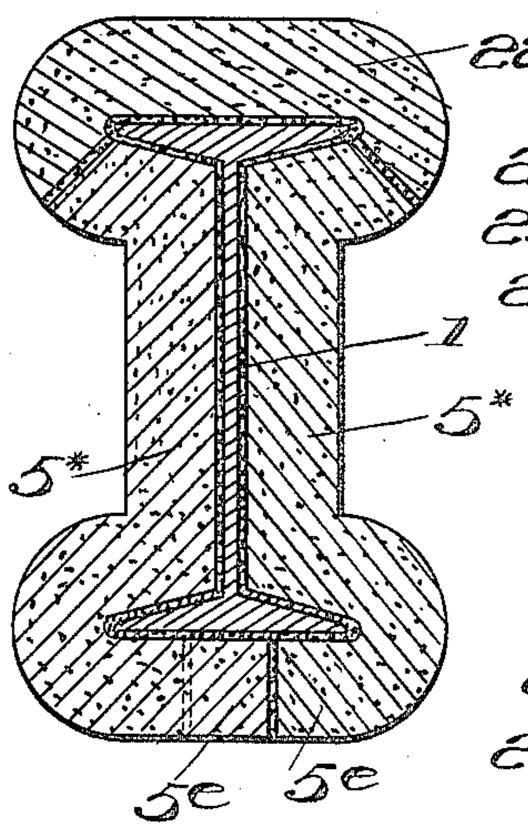


Fig. 8.

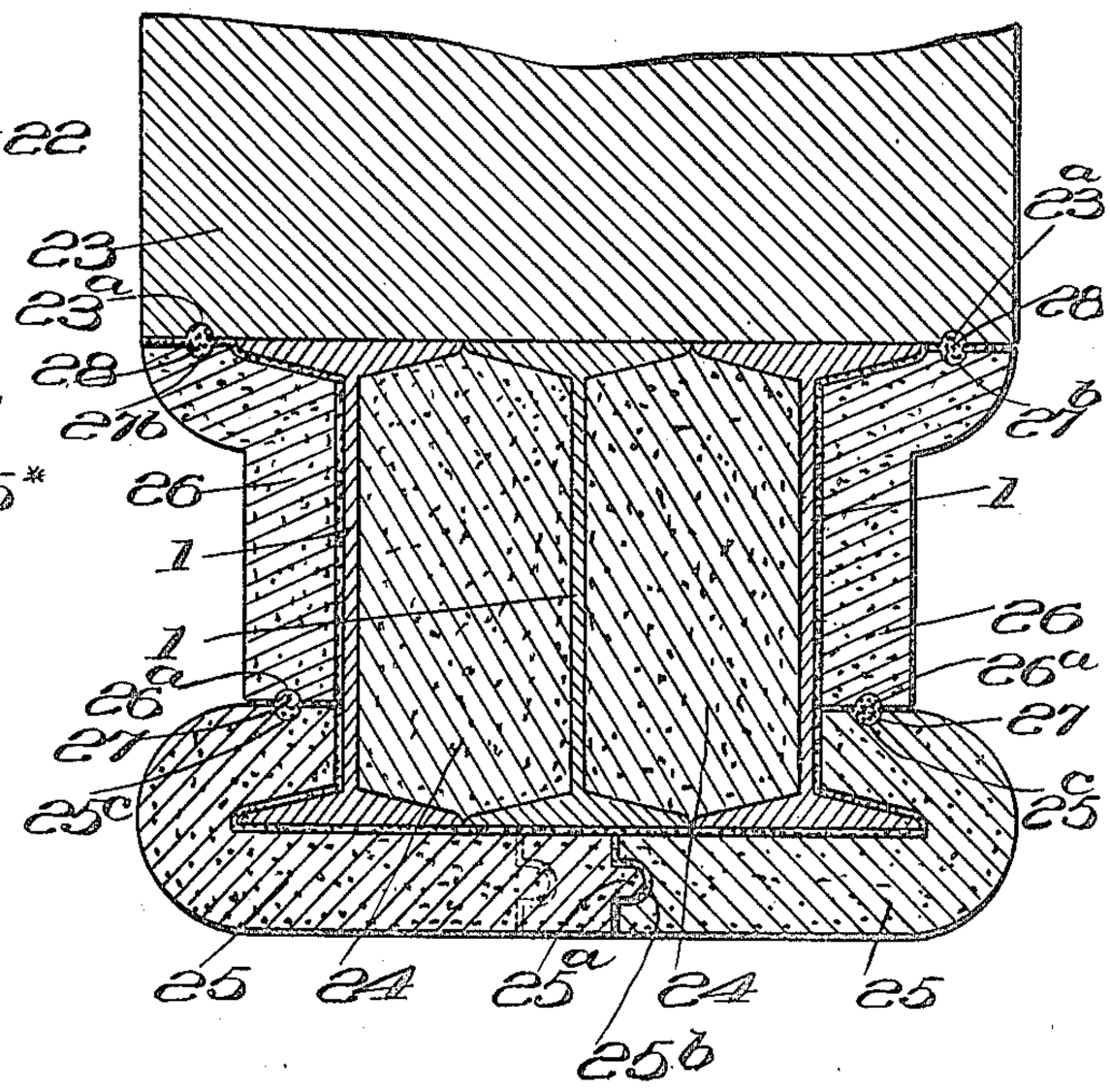


Fig. 10.

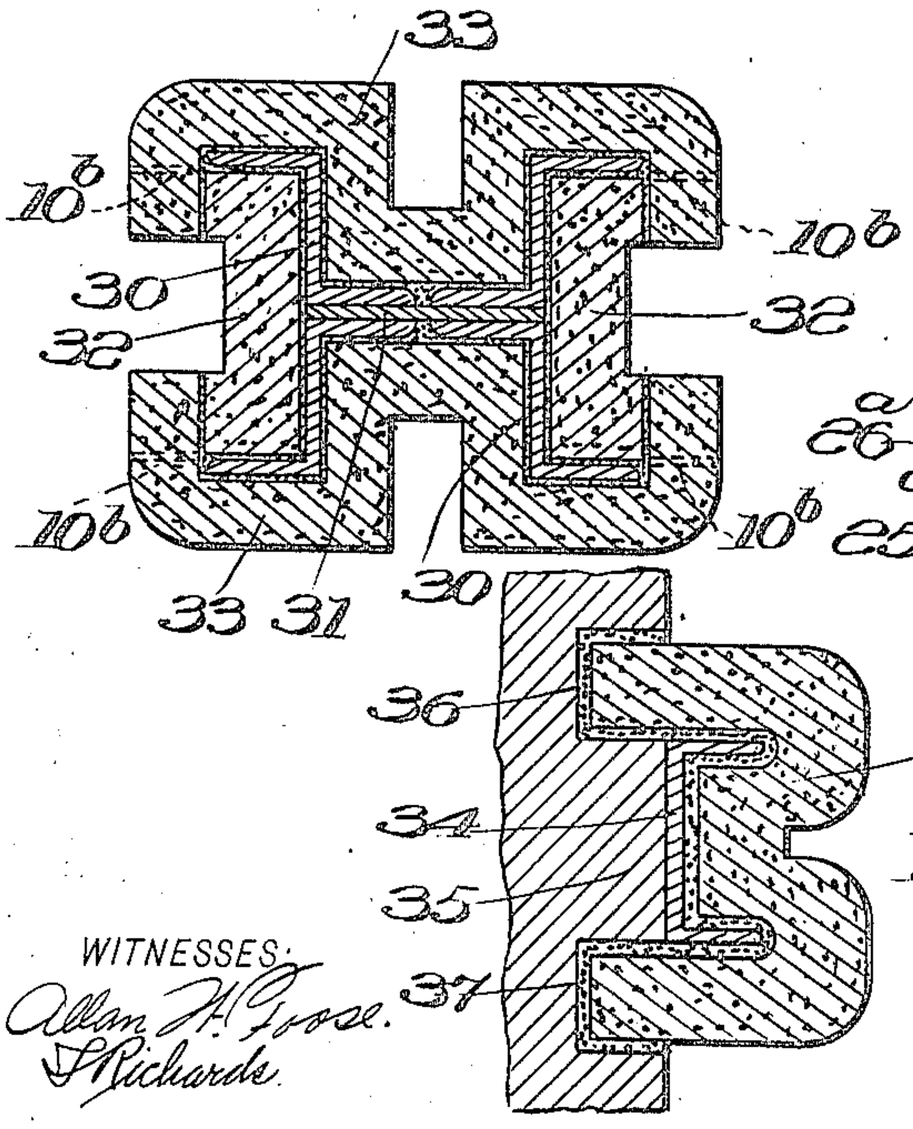
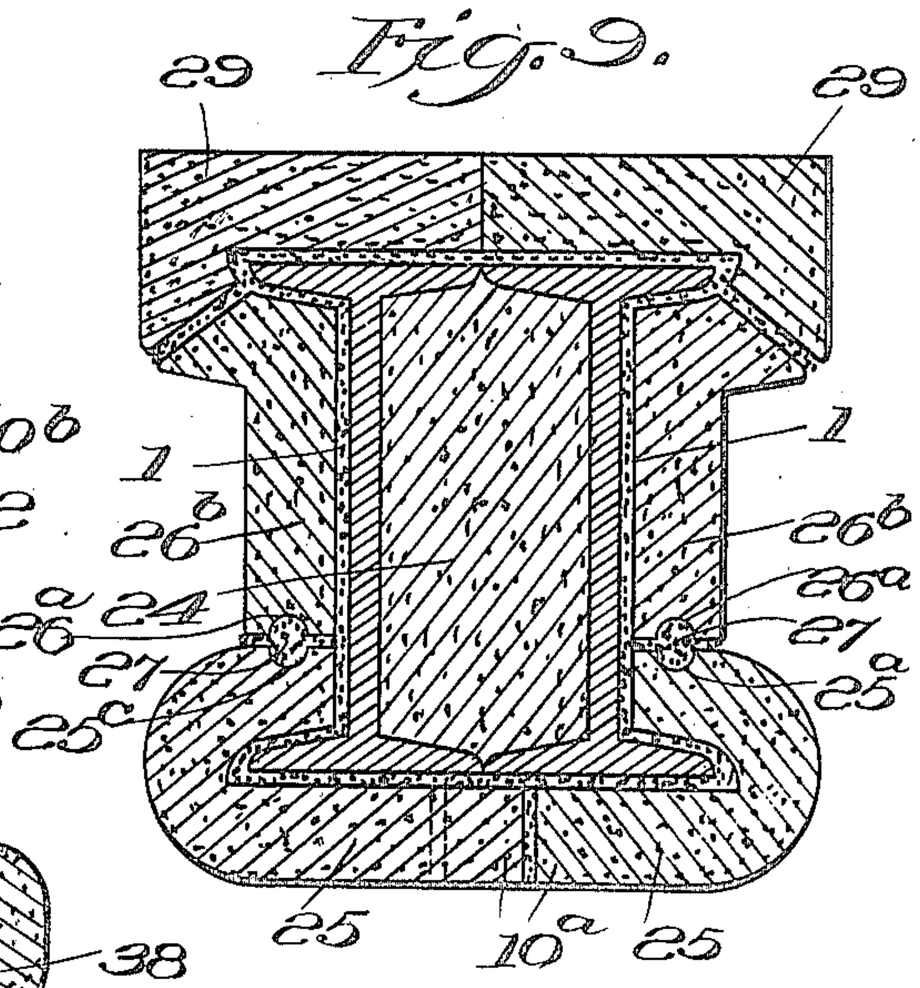


Fig. 9.



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UNITED STATES PATENT OFFICE.

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FIREPROOF CONSTRUCTION.

1,136,874. Specification of Letters Patent. Patented Apr. 20, 1915.

Application filed January 20, 1906. Serial No. 296,981.

To all whom it may concern:

Be it known that I, STEPHEN J. HAYDE, a citizen of the United States, and a resident of Kansas City, county of Jackson, and State of Missouri, have invented certain new and useful Improvements in Fireproof Constructions, of which the following is a specification.

One of the objects of my invention is to prevent all air spaces which usually surround the beams and columns forming the steel structure of a building.

Another object is to arrange the hangers which support the ceilings in a building in such a manner that they may be readily and accurately placed in position.

Another object is to produce fire-proof blocks shaped or molded so as to snugly fit the beams and columns and provide said blocks with interlocking edges or ends so that they may be secured together by mating the interlocking ends without the use of wire or other extraneous fastening means.

Other objects will appear from the hereinafter description.

The invention is illustrated in the accompanying drawings in which the same reference character indicates the same part in the different views.

Figure 1 is a section on line 1 of Fig. 2, showing my improved fire proof construction applied to beams and columns of a building. Fig. 2 is a section taken on line 2 of Fig. 1. Fig. 3 is an under view of a portion of the beam covered by fire proof blocks showing the manner of interlocking the blocks. Fig. 4 is a perspective view of one of these blocks. Fig. 5 is a perspective view of one of the sections or blocks of my fire proof material surrounding the column shown in Figs. 2 and 3. Fig. 6 is a detail perspective view of one of the hangers and its seat. Fig. 7 is a cross sectional view showing the form of blocks applied to an I beam or girder. Fig. 8 is a similar view showing the form of blocks as applied to a multiplicity of I beams used as girders. Fig. 9 shows another construction of blocks applied to I beams. Fig. 10 is a cross sectional view showing the shape of block applied to still another form of beams used for a built up column. Fig. 11 shows a construction as applied to a channel iron placed against the wall of a building.

On the drawing the part marked 1 represents an I beam used as a girder, and 2 represents a column on which this girder is supported.

3 is a series of I beams running transversely of the girder 1, and which are secured to the girder by angle plates 4 in the usual manner, as more clearly shown in Fig. 2 of the drawing. The sides and bottom part of the girder 1 are incased in the fire proof blocks 5, and they are preferably molded as more clearly shown by Fig. 4. These blocks are reinforced with a vertical intermediate rib 5^a and two end ribs 5^b, the end ribs being about one half the thickness of the intermediate rib. The lower portion or end of this block is provided with an integral inturned part 5^c which surrounds the lower flange of the I beam girder 1, there being left a channel 5^d in this portion of the block, into which the flange of the I beam fits. The under abutting edges of these blocks are provided with interlocking members 5^e, Fig. 3, which reliably hold the blocks together after they have been fitted onto the I beam. The upper edges 5^f of the blocks are beveled, as shown at 5^g in order to form skew backs against which the concrete foundation 6 for the flooring 7 is laid. Embedded in this concrete construction are the wood strips 8 to which the flooring is secured in the usual manner. In applying these blocks to the girders, spaces are left between the blocks and girders which are filled with a cement mortar 9, which forms a bond between the blocks and the girders, effectually closing up any air spaces which might otherwise be left or formed between the blocks and girders.

The cross beams 3 are incased in blocks 10 substantially the same in form and construction as the blocks 5. The columns are incased in blocks 11 molded to shape, as shown in Fig. 5, and which extend about half way around the columns, so that when they are fitted together, completely surround the columns. These blocks are provided at their abutting edges with interlocking parts 11^a by which they are securely held in position when placed around the columns and fitted together. These blocks are further held together by tongues 11^b and grooves 11^c formed respectively at the upper and lower ends of these blocks. Before the blocks 5, 10 and 11 are placed in position and secured to the girder and cross beams, a false ceiling 12 is placed in posi-

tion, as shown in Fig. 1 of the drawing. This false ceiling is provided with holes 13 for the reception of the seats 14. These seats 14 have holes therein 14ª, to permit particles of dirt to fall through and to prevent the seats from becoming clogged. U shaped hangers 15 are placed in the seats and the concrete foundation 6 is then laid upon the false ceiling 12, and the upper ends of the hangers are embedded therein. The lower loops of the hangers are provided with cores 17 to prevent the concrete from filling these parts, so that when the filling is removed, the hooks to support the ceiling may be inserted therein. After the concrete foundation has set, the false ceiling 12 and the seats 14 and the cores 17 in the looped portions of the hangers 15 are removed.

18 represents suspension rods, one end of each of which is provided with a turned over or hooked end 18ª, and the lower ends of which are turned into a hook or seat 18ᵇ. The hooks 18ª of these rods are inserted in the lower looped portions of the hangers 15.

19 represents cross bars which are placed in the hooked portions 18ᵇ of the rods 18.

20 is metallic sheathing which is secured to the cross bars 19 in any approved manner. 21 represents mortar which is applied to and covers the lower or under portion of this metallic ceiling.

In the construction shown in Fig. 7, the I beam girder 1 is incased in blocks 5* similar in form to the blocks 5, with the exception that the ribs 5ª and 5ᵇ are dispensed with, and a cap 22 is placed on the upper flange of this girder between the same and the concrete floor foundation which will be laid upon the structure and will be supported by the beam and block through the intermediate cap. It is proper, however, to mention that this cap may be regarded as a part of the floor-foundation. The abutting ends of this block 5* also have interlocking members 5ᵉ similar in construction to those shown in Fig. 3 as heretofore described.

In the construction shown in Fig. 8, the girder consists of three I beams 1 supporting a wall of masonry 23. The spaces between the I beams are filled with closely fitting blocks or concrete 24. The under surfaces or lower flanges of these I beams are incased in blocks 25. Blocks 26 are provided which fit against the outer web of the upper flanges of the two outer beams. The abutting ends of the blocks 25 are held securely together by tongue and groove connections 25ª and 25ᵇ. On the upper edges of the blocks 25 and the lower edges of the blocks 26 I provide grooves 25ᶜ and 26ª respectively, which mate and form the openings 27, and in the upper edges of the blocks 26 where they rest under the masonry wall, I provide a groove 27ᵇ and in the masonry itself, I form corresponding grooves 23ª, which mate and also form another circular opening 28. In these openings I place mortar which, when dry, securely holds the blocks 26 in position.

In Fig. 9 I have shown a construction in which the girder is formed of two I beams, with the space between them filled with blocks 24, and the lower portions are incased in blocks 25 of the same construction as that shown in Fig. 8. Fitted against the outer surfaces of the flanges and the under surface of the upper web is the block 26ᵇ. In this construction, instead of having the girder directly support the wall of masonry or a girder, I fit to the upper surface of these I beams girders, the caps or blocks 29, which extend down over the side of the upper flanges of the girders and rest against the upper beveled edges of the blocks 26ᵇ. The meeting edges of the blocks 25 and 26ᵇ are provided with grooves 25ᶜ and 26ª which, when fitted together, form the openings 27 into which the mortar is forced to lock these two blocks together. The meeting edges of the blocks 25 are provided with interlocking members 10ª, referred to in describing the constructions shown in Figs. 1, 2, 3 and 7.

In Fig. 10 I have shown still another construction. In this construction the column is made up of a series of Z beams 30, which are joined together by a plate 31 forming a built up column construction. These columns are incased in blocks 32 and 33, made to fit the sides and webs of the columns closely, and they are reliably held together by interlocking ends 10ᵇ, similar in construction to the interlocking members 10ª hereinabove described, and all of which is clearly shown in the drawing.

In Fig. 11 I have shown a construction which is adapted to fit against the face of the wall. In this construction I provide a channel iron or girder 34 with the flat side fitting closely against the wall 35. The wall is provided with recesses 36 and 37 just above and below the channel beam. Fitting in this recess and surrounding the I beam is the block 38, which is formed and constructed to fit around the webs of the beam and into the recesses 36 and 37.

In all of these constructions in order to prevent the formation of air spaces that naturally form between the blocks and girders, I fill in between with a cement mortar or grout which completely fills any existing spaces, and also assists in holding the blocks securely to the girders. This may be done in many different ways. Where the metal beams are covered on all sides after the truss is constructed and in position, the blocks are made and applied with the interlocking scheme, but before securing the blocks in

place, the girders are covered with cement and powdered burnt clay mixed to a determined consistency with water to a thin mortar which practically excludes all air spaces from and around the metal girder. By doing this, all exposed hangers, channels and flat bars that may occur in the construction of any building, are protected from fire. In the case of a church where the roof is carried on trusses, or a large hall where the roof trusses are all exposed, these blocks can be made and applied in an ornamental manner to fit the conditions.

From the above description it is apparent that I have produced a fire proof construction which is well adapted for the purposes intended, and as I dispense with all air spaces, the blocks will not be forced out of position by heating and consequent expansion of air, and hence it will be impossible for flames to reach the beams, columns or girders which are surrounded by the blocks, or for the same to become sufficiently heated to twist or spring out of place. Therefore, the floor and other woodwork of a building constructed in accordance with my plans can burn out without affecting the steel structure covered by my blocks.

As many changes could be made in the above construction and many apparently widely different embodiments of my invention could be made without departing from the scope thereof, I intend that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. I desire it also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

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

1. In a fire proof construction, the combination of an I beam placed with the web vertical, blocks fitted around the side and the lower flanges of said beam, said blocks having a portion of their upper edges beveled to fit against the under side of the upper webs and having the other edges beveled in another direction, said blocks being provided at their under abutting edges with interlocking members and tongue and groove connections on the end thereof, a concrete floor foundation supported by said beam and blocks, hangers fitted in and depending from said concrete foundation, suspension rods secured at their upper ends to said hangers, bars secured to the lower ends of said suspension rods, and metallic lathing secured to said bars.

2. In a fire proof construction, an I beam, blocks arranged to fit against the sides of the beam, arms integral with said blocks and adapted to fit around the flange of the beam, said arms being provided with interlocking members and the side of the blocks being provided with reinforced ribs.

3. In a fire proof construction, an I beam, blocks fitting against the side of said beam, arms integral with the blocks and adapted to fit around the lower flange of the beam, interlocking members on said arms, reinforcing ribs on the sides of the blocks, and a cap covering the upper surface of the I beam and the upper terminals of the blocks.

4. In a fire proof construction, an I beam, blocks fitting against the side of said beam, arms integral with the blocks and adapted to fit around the lower flange of the beam, interlocking members on said arm, reinforcing ribs on the sides of the blocks, a cap covering the upper surface of the I beam and the upper terminals of the block and a cement or grout between the surface of the I beam and the blocks and cap.

5. In a fire proof construction, an I beam, and blocks comprising portions which are fitted against opposite sides of the beam, other portions which extend therefrom toward each other around the lower flange of the beam and have interlocking members, a cap covering the upper surface of the I beam and the upper terminals of the blocks, and a cement or grout between the surface of the I beam and the blocks and cap.

6. In a fire-proof construction, an I beam, fire-proof blocks having interlocking members on the edge thereof, tongue and groove connections on the ends thereof arranged to fit against the side of the beam, arms integral with the blocks adapted to fit around the flange of the beam, the arms being provided with interlocking members, the sides of the blocks being provided with reinforced ribs, and cement or mortar between the blocks and the said metal members.

In witness whereof I have hereunto set my hand at the city of Kansas City, county of Jackson, State of Missouri, this 15th day of January, 1906.

STEPHEN J. HAYDE.

In presence of—

JOHN C. HAYDE,

ELIZABETH A. HAYDE.