

No. 612,594.

Patented Oct. 18, 1898.

F. S. MILLER.  
FIREPROOF PARTITION.  
(Application filed Nov. 13, 1897.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

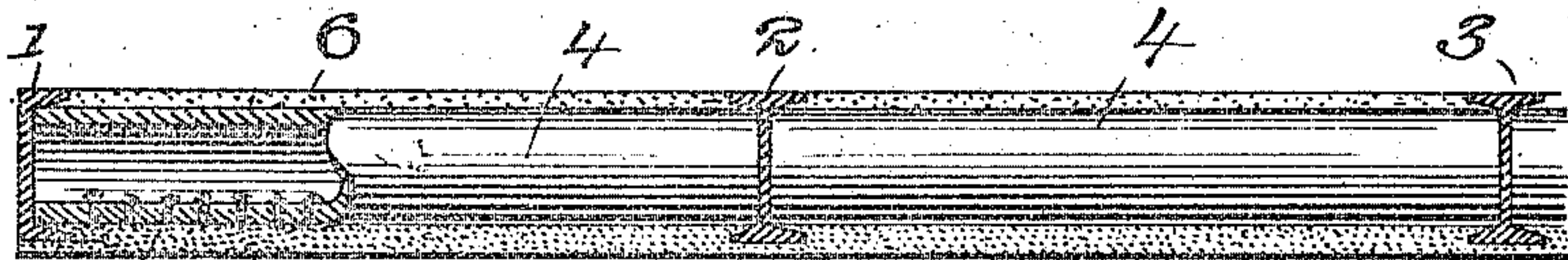


Fig. 3.

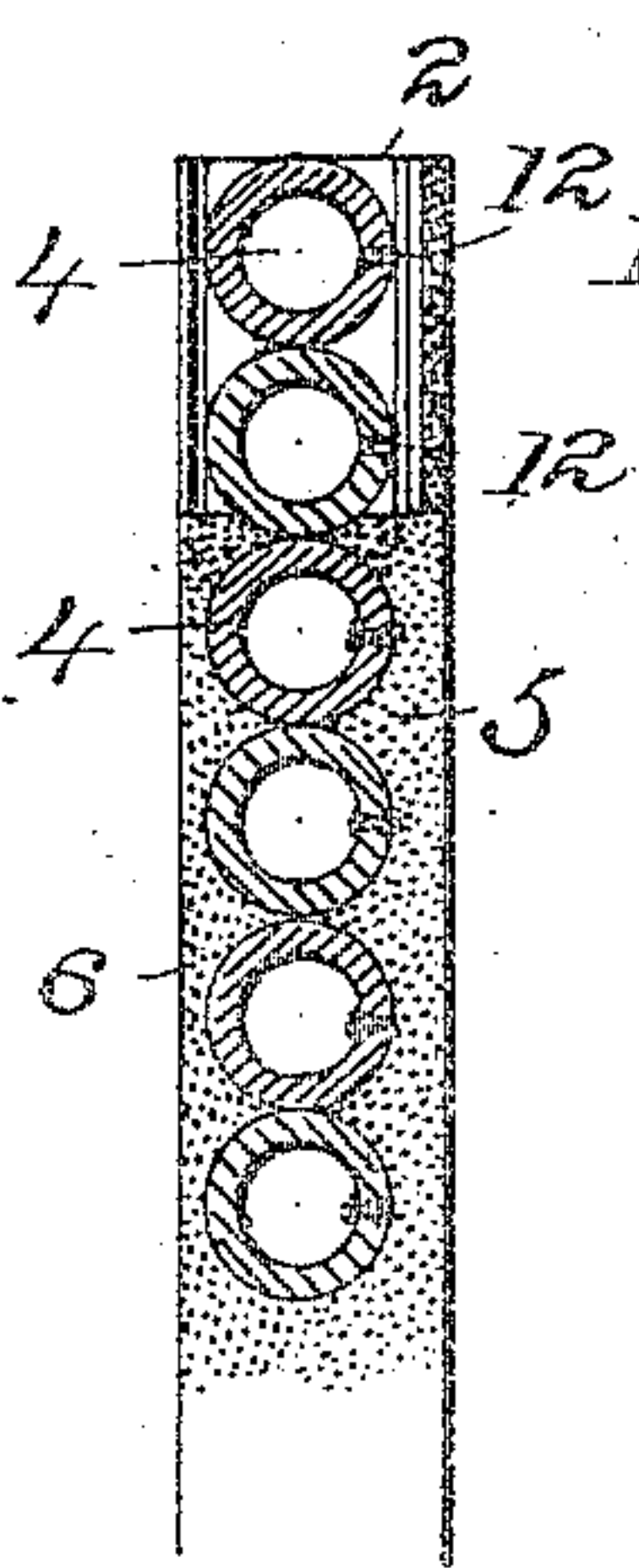


Fig. 2.

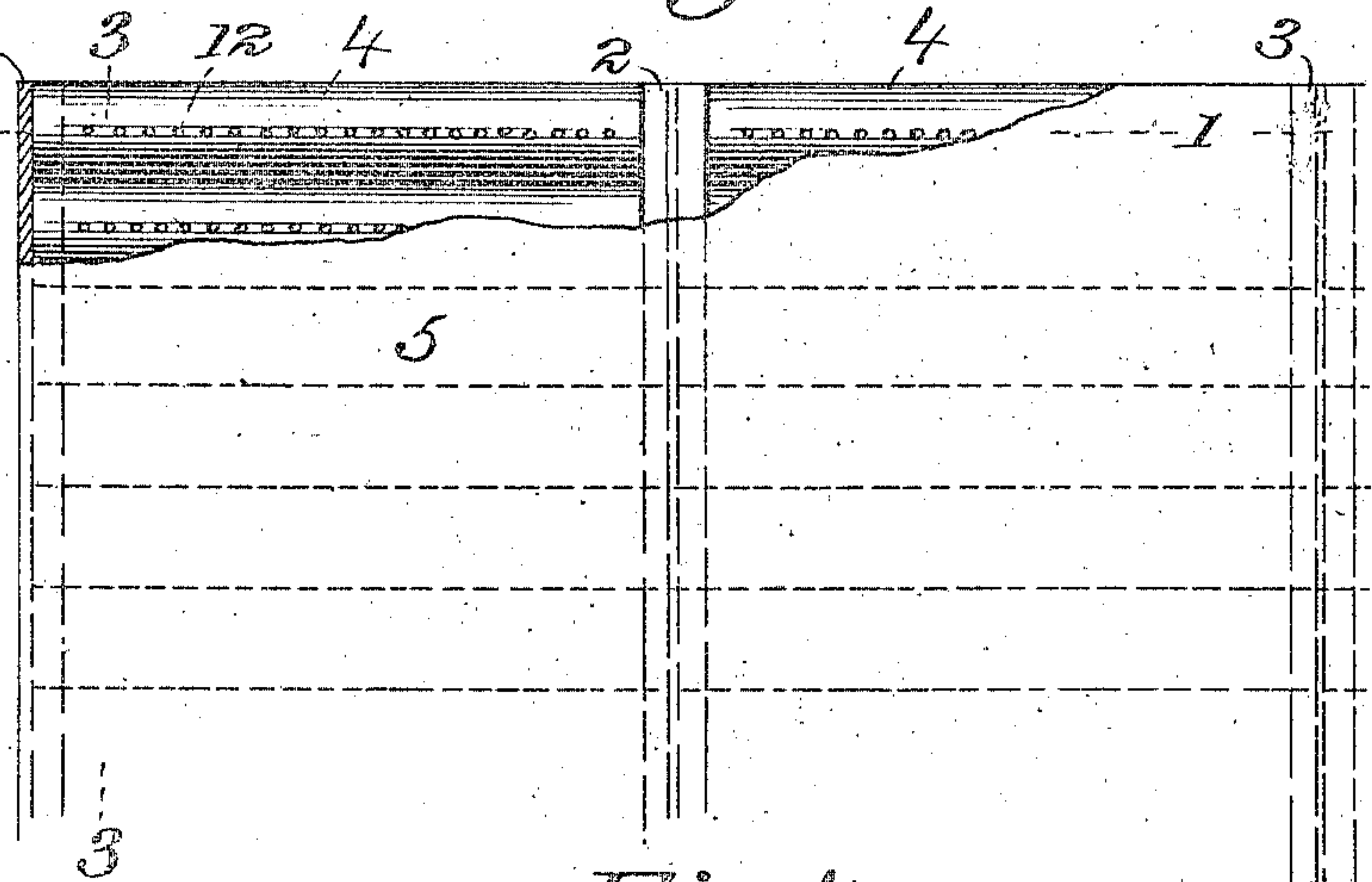


Fig. 4.

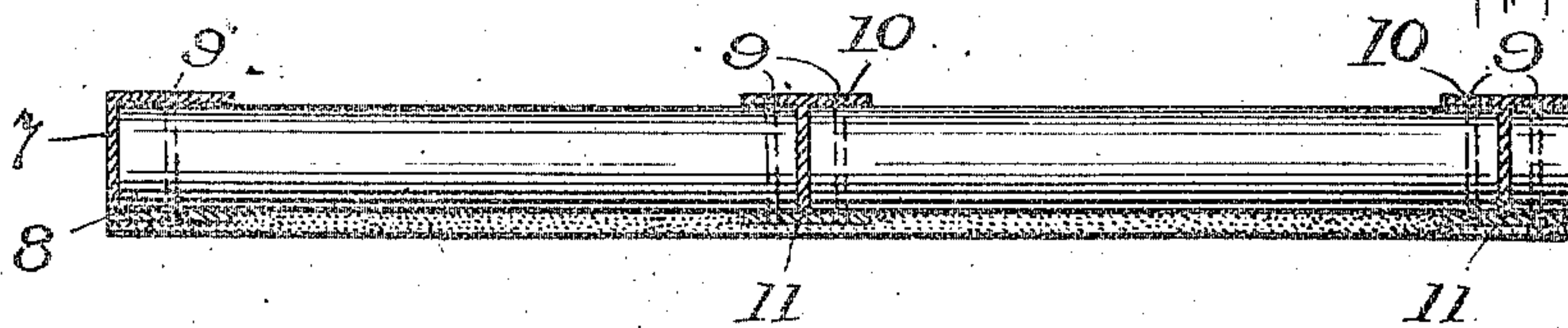


Fig. 5.



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2 Sheets—Sheet 2.

Fig. 5.

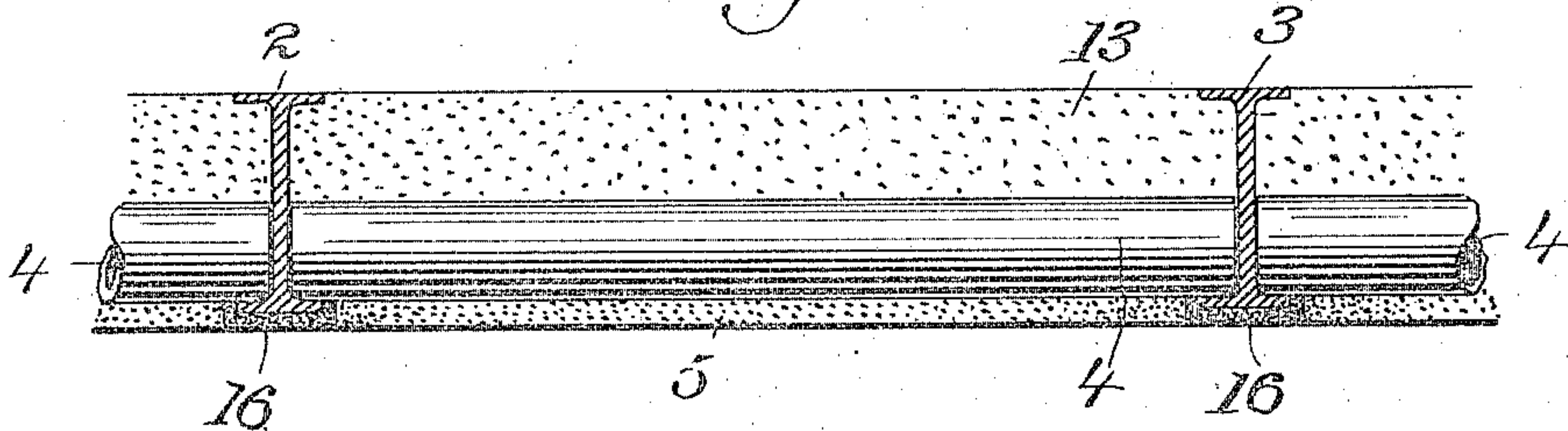


Fig. 6.

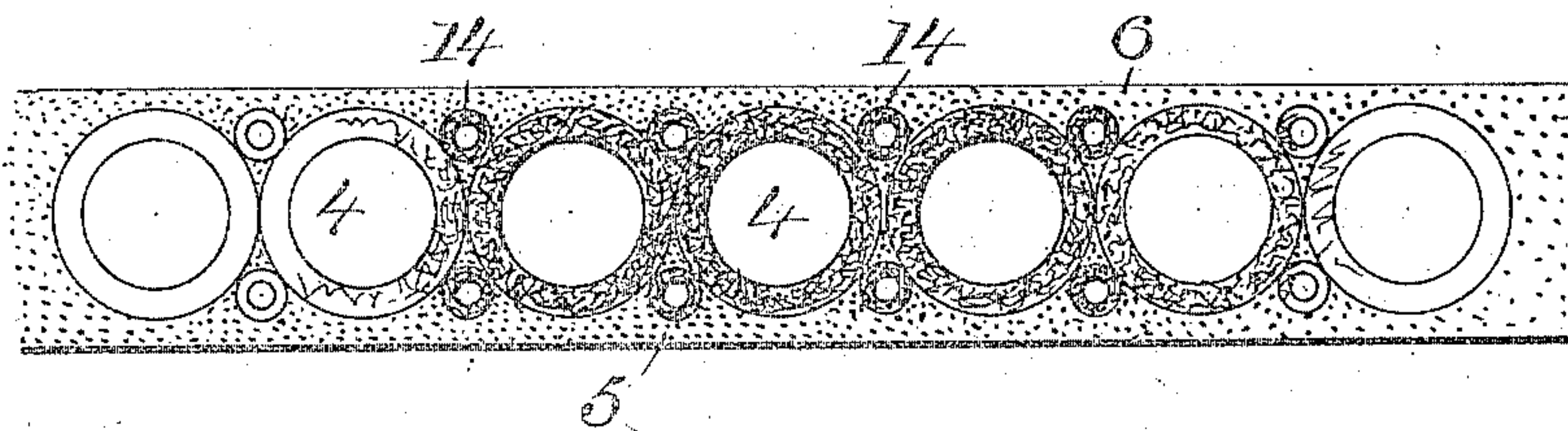


Fig. 7.

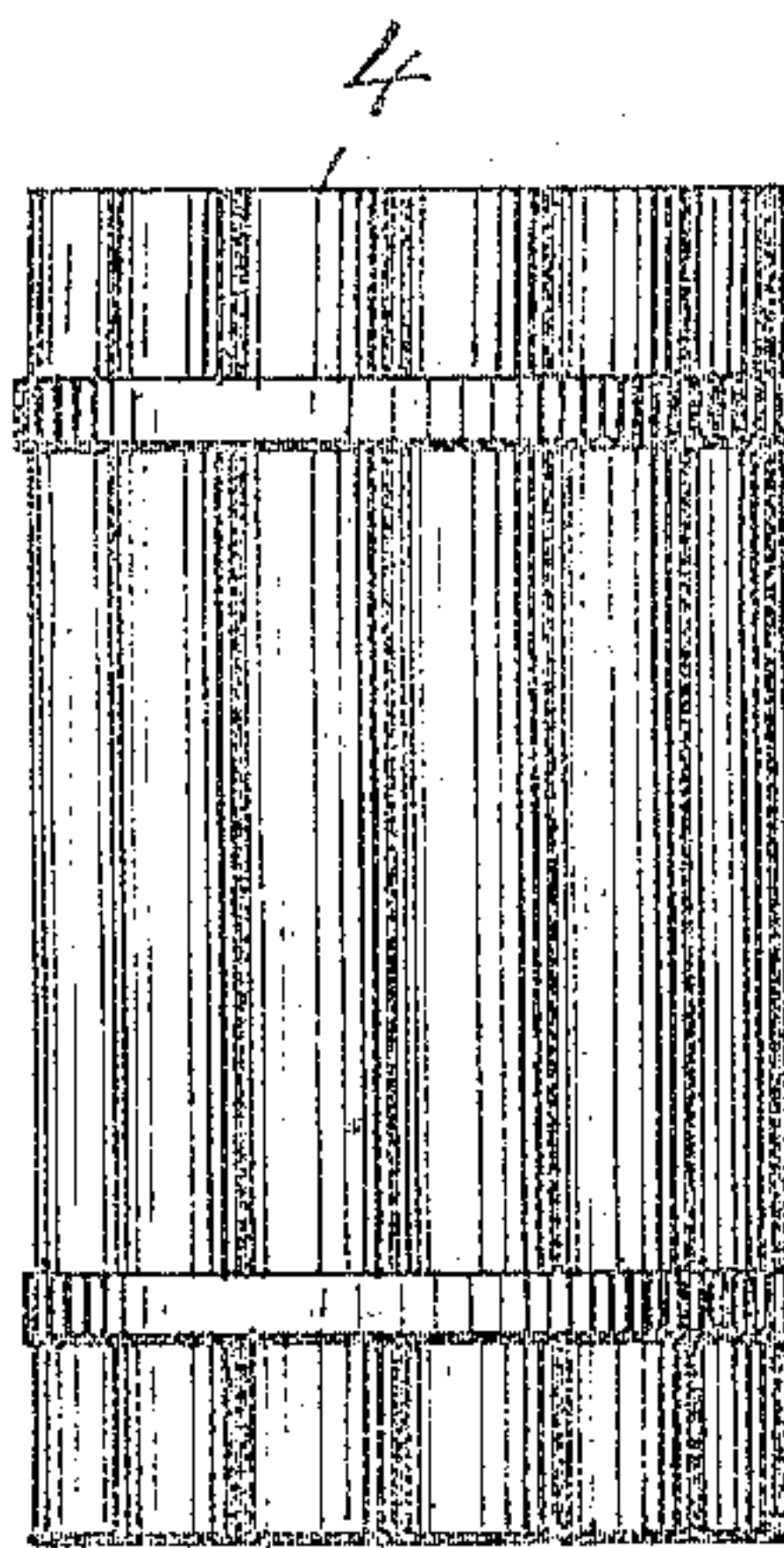
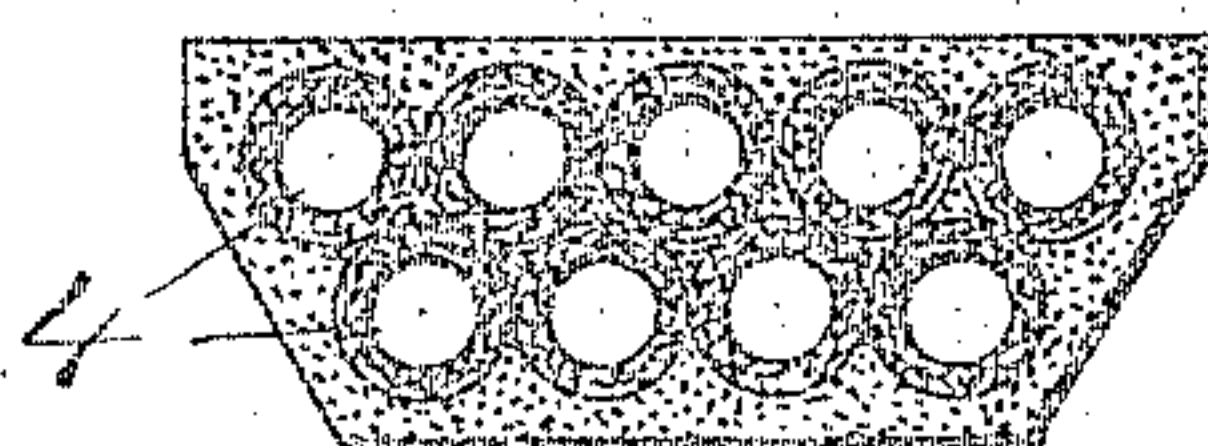


Fig. 8.



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# UNITED STATES PATENT OFFICE.

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## FIREPROOF PARTITION.

SPECIFICATION forming part of Letters Patent No. 612,594, dated October 18, 1898.

Application filed November 13, 1897. Serial No. 658,431. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERIC S. MILLER, a citizen of the United States, residing in New York, (Brooklyn,) in the county of Kings, State of New York, have invented certain new and useful Improvements in Fireproof Partitions, of which the following is a full, complete, and exact specification, sufficient to enable those skilled in the art to make and use the same.

My invention relates to rendering buildings fireproof, and is more specifically designed to produce an improved wall, floor, partition, or covering which shall be as nearly as possible fireproof and at the same time light in weight and easily placed in position. The present practice of using fire-brick and terra-cotta in the formation of walls and floors in the modern steel buildings adds a heavy weight to the structure and possesses other disadvantages which it is the object of my invention to avoid.

The preferred form of my construction is illustrated in the accompanying sheet of drawings, in which—

Figure 1 is a horizontal section of the wall constructed in accordance with my invention, being taken on the line 1 1 of Fig. 2. Fig. 2 is a side elevation, partly broken away, of said wall. Fig. 3 is a vertical section on line 3 3 of Fig. 2. Fig. 4 is a horizontal section showing a modified construction. Fig. 5 illustrates the construction common in the case of fireproofing floors. Fig. 6 shows modified form of floor construction. Fig. 7 illustrates one method of applying my fireproofing to columns. Fig. 8 illustrates a method of forming fireproof material into separate blocks. Fig. 9 illustrates a modification.

Throughout the drawings like reference-figures refer to like parts.

1 2 3 represent the vertical steel beams of a building or they may represent the floor-beams of said building.

4 4, &c., represent a series of tubes which are preferably formed of some light fireproof material, such as those in the trade which are formed by rolling up asbestos, mill-board, or felt or paper coated with silicate of soda or similar fireproofing material. In certain

cases light tubes formed of sheet-iron or other metal may be employed, but these must usually be prepared, as will be hereinafter described, to enable the plastic material to adhere to them. These tubes extend continuously across from one beam to another, and their ends fit into the groove formed in the sides of these beams. Such grooves occur in the ordinary form of channel-iron 1 or in the I-beams 2 3, which are commonly used in steel and iron construction. The tubes 4 are covered and also held together by a body of cement, plaster, or similar materials 5, which fills up the interstices between the tubes and forms a smooth facing for the wall or ceiling. Any suitable material may be employed; but I prefer what is known in the trade as "asbestos," the same being a mixture of short-fibered comminuted asbestos and lime or cement. This material is in the case of the partition or wall applied on both sides of the row of tubes, so that the opposite side 6 is also built out to present a flat face.

The construction illustrated in Figs. 1, 2, and 3, employing I-beams and channel-irons, may be varied by employing numerous constructions, one of which is illustrated in Fig. 4, where angle-iron 7 and T-irons 10 are employed, the necessary groove being formed by bolting plates 8 11 to the said angle and T-irons by means of bolts 9 9, &c.

In the case of fireproofing a floor the depth of the beams supporting the floor is sometimes so great that it is not advisable to use tubes of diameter equal to width of the groove formed between the two flanges of the I-beams. In such a case I employ tubes of less diameter, as illustrated in Fig. 5, and fill in the space above them with any cheap fireproofing material 13. In cases where large tubes of diameters equal to depth of beams are employed it is advisable to partially fill the spaces between them underneath and sometimes also above by small tubes 14, as shown in Fig. 6.

In applying my fireproofing material to vertical columns tubes may be made the entire length of the column and bound about the same, as shown in Fig. 7. In case it is desired to use my fireproofing material in the form of separate blocks these may be readily made



by binding a number of tubes of the proper diameter and length together and embedding them in a mass of plastic material formed in molds of proper shape, thus producing an article of manufacture in the shape of light block of fireproofing material of cellular construction having great strength in proportion to its weight, as illustrated in Fig. 8.

I find that the plaster, asbestic, and other plastic material employed adhere strongly to the tubes formed of fibrous materials, as described, by reason of the fact that the water in the plastic material when the same is applied softens the surface of the tubes and, the substances being similar, cohere and form really one solid mass with the tubes. This occurs to a special degree of perfection when asbestos tubes and asbestic plaster are used. In case materials are employed which do not have this faculty of cohesion—such, for instance, as tubes of sheet-iron—I perforate the sides of the tubes with a series of perforations 12, &c., through which the plastic material will be forced during its application, forming projections or tongues, as shown in Figs. 1 and 3, which will firmly grasp the tubes.

The method of constructing and operating my invention is clear from the foregoing. The iron-work of the building being in place, the tubes, cut to the proper length and formed of the proper diameter, are piled one above the other in the grooves in the sides of the beams, as shown in Figs. 2 and 3. In the construction shown in Fig. 4 this operation might be facilitated in some cases by placing the tubes in position before the plates 8, 11, &c., are bolted on. The tubes being in position, the plastic material is then applied in the usual manner. If the tubes have been perforated, as shown in Figs. 2 and 3, they should of course be arranged in position so that the perforations will come at the side.

In the modification illustrated in Fig. 9 a series of half-tubes or corrugated asbestos paper or other similar materials formed in the shape of the series of half-tubes may be substituted for the series of tubes shown in other figures in the corrugated paper, as shown at 15. In many cases the plaster which covers the face of the iron beam shows a tendency to crack off, and I therefore prefer to substitute for it a specially-formed flat half-tube 16, as shown in Fig. 5.

Among other advantages of the construction are its extreme lightness combined with its high fireproofing qualities. Moreover, while sufficiently strong to remain in position under all ordinary strains a partition thus formed can be readily and neatly cut through to form doorways or passage-ways for pipes and electrical wires. The cohesion occurring between the plastic material and the supporting-framework of tubes is also a feature of great advantage, as the result is a solid mass of nearly uniform molecular structure throughout, and the possibility of the scaling and fall-

ing of the material from wall or ceiling is almost absolutely eliminated.

Another advantage of my invention consists in the rapidity with which the partitions may be put up and the fact that skilled labor now necessary in putting in fire-brick or terracotta is entirely dispensed with.

Various changes could be made in the details of my invention without departing from the spirit and scope thereof, as long as the relative arrangement of parts, as illustrated in the drawings, and the principle of the construction described in the specification are preserved. In certain cases also the plastic material might be dispensed with and the protection afforded by the series of tubes piled one above the other and in close contact might prove sufficient.

I employ the word "partition" in its broad sense to include both partitions between compartments of the building, exterior walls, and the floors.

Having therefore described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. A fireproof partition composed of grooved supports, and a series of independent, cylindrical asbestos tubes arranged at right angles to said supports, with their ends resting in said grooves, substantially as described.

2. A fireproof partition composed of grooved supports, and a series of independent, cylindrical asbestos tubes, arranged at right angles to said supports, with their ends resting in said grooves, together with a body of plastic material, adhering to said tubes, and filling the interstices, between the same substantially as described.

3. A fireproof partition, composed of grooved supports, and a series of asbestos tubes, arranged at right angles to said supports, with their ends resting in said grooves, together with the mass of comminuted asbestos and cement, which fills the interstices between said tubes, substantially as described.

4. A fireproof partition composed of grooved supports and a series of independent, cylindrical tubes, arranged at right angles to said supports, with their ends resting in said grooves, said tubes being perforated to admit the plastic material to the interior of said tubes, substantially as described.

5. A fireproof partition composed of grooved supports, and a series of incombustible tubes of fibrous structure, arranged at right angles to said supports, with their ends resting in said grooves, substantially as described.

6. As an article of manufacture a cellular block of fireproofing material composed of a series of tubes of fibrous fireproof material embedded in a body of fireproof cement and intimately cohering thereto substantially as described.

7. As an article of manufacture, a cellular block of fireproofing material, composed of asbestos tubes embedded in a mass of asbestic



plaster, and intimately cohering thereto substantially as described.

8. A fireproof covering composed of a series  
of tubes of fibrous fireproof material em-  
5 bedded in a body of fireproof plastic material,  
and intimately cohering thereto substantially  
as described.

In testimony whereof I affix my signature  
in the presence of two witnesses.

FREDERIC S. MILLER.

Witnesses:

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JOHN S. MOWRY.