

No. 735,335.

PATENTED AUG. 4, 1903.

C. S. BIRD.
FIREPROOF STRUCTURE.
APPLICATION FILED DEC. 8, 1902.

NO MODEL.

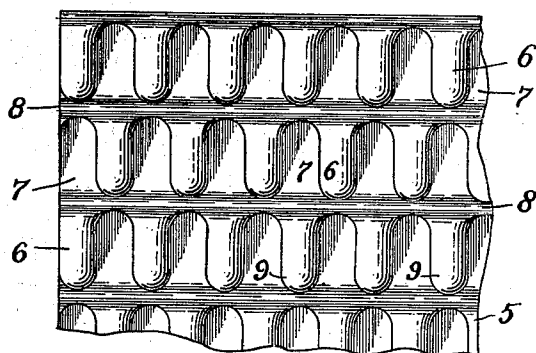


Fig. 1.

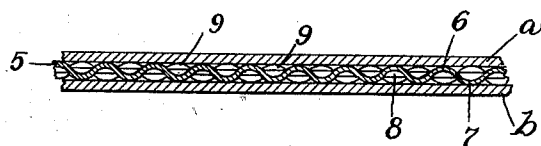


Fig. 2.

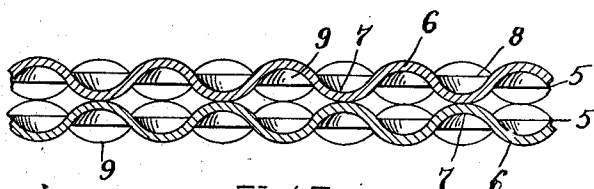


Fig. 3.

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FIREPROOF STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 735,335, dated August 4, 1903.

Application filed December 8, 1902. Serial No. 134,242. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. BIRD, a citizen of the United States, residing at East Walpole, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Fireproof Structures, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in fireproofing structures.

One object of the invention is to so construct a fireproofing structure of fibrous material that a succession of air-compartments is formed at both sides of the structure, whereby comparatively small areas of the material are in contact with the outer layers.

Another object of the invention is to so construct fireproofing structures of fibrous material having air-compartments that these compartments may yield in some degree to the expansive action of air under increased temperature.

Another object of the invention is to provide fibrous fireproofing material with air-compartments of similar shape at both surfaces.

The invention consists in a sheet or layer of fibrous material impregnated with fireproofing compound and having the peculiar air-compartments.

The invention also consists in such other novel features in the construction of the fireproofing material whereby the objects of the invention are carried into effect, as shall hereinafter be more fully described, and pointed out in the claims.

Figure 1 represents a plan view of a portion of the improved fireproofing structure or layer. Fig. 2 represents a sectional view of the same as preferably used between layers of other material to form a fireproofing or fire-retarding structure. Fig. 3 represents a sectional view, on an enlarged scale, of two layers of the improved structure to more clearly indicate its construction.

Similar numbers of reference designate corresponding parts throughout.

Fireproofing structures of this general nature are designed for use as intermediate layers in compound structures, which are in-

tended to so support the fireproofing layers that the action of the fire may be resisted and its progress retarded. When the exterior layers of the compound structure are of wood, it is important to resist the charring action of the attacking flames and to maintain the intermediate layer in condition to retard the passage of heat to the unattacked outer layer. Intermediate layers of fibrous material carrying fireproofing compounds when placed flat between two outer layers of wood are attacked by the heat penetrating the wood before the wood is actually burned away and are so charged that when the wooden layers are partially burned away they offer but slight resistance to the action of the flames.

In carrying this invention into practice it is my object to so construct a fireproofing structure adapted among other uses to be utilized as an intermediate layer in a compound structure that large bodies of air may be interposed between this inner layer and the outer layers and that the areas of contact between the inner layer and the outer layers may be small as compared with the area of air maintained against the outer layers and while allowing for the expansion of the air under heat while preventing such undue circulation of the air as would tend to ignite a charred portion.

In the drawings, 5 represents a portion of a sheet or web of fibrous material, usually formed of paper-stock or similar comparatively cheap material, impregnated in the course of manufacture with a fireproofing compound, preferably with phosphate of alumina. In this sheet or web 5 are pressed or formed a series of air-compartments 6 6 at one side of the sheet and 7 7 at the other side thereof, these compartments projecting from the bands 8 8 in a series of convex pockets having closed ends 9 9 and arranged in lines, the compartments of one line being staggered in relation to the compartments of the adjacent lines and the compartments 6 6 at one side of the sheet being in intermediate position relative to the compartments 7 7 at the other side of said sheet. When the structure thus formed is placed between the outer layers *a* and *b*, a series of air-bodies lie between the compartments 6 6 and the inner surface of the layer *b* and between the compartments 7 7 and the

inner surface of the layer *a*, while the areas of contact between the convex surfaces of the several compartments and the inner surfaces of said outer layers are comparatively small and widely separated.

Under the action of fire the maintenance of the comparatively large areas of air against the inner surface of the outer layer *a* or *b* tends to reduce the temperature of this portion of the outer layer, while at the same time these interposed bodies of air insulate comparatively large areas of the intermediate sheet 5 from the action of the heat transmitted through the outer layers. The air as it expands under the action of the heat may pass into the channels formed by the bands 8 8; but any excessive movement of the air is interrupted, owing to the formation and relative position of the compartments, and it is evident that the compartments may expand and contract with the changes in temperature.

Aside from the maintenance of the bodies of air insulation between the inner layer 5 and the outer layers *a* and *b*, this layer 5 further acts to retard the action of the fire by reason of the comparatively small areas of contact between its main body and the outer layers *a* and *b*, and it is apparent that practically all the points of contact between the sheet 5 and either of the layers *a* or *b* might be charred through without materially affecting its office as a fire-retarding medium, as the main portion of the sheet would be held together by those portions more nearly adjacent to the other layer *a* or *b*, as the case might be, and these portions would be less affected by the action of the fire owing to their angular disposition.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A fibrous fireproofing-sheet having a se-

ries of elongated contact portions arranged in rows and having convex end portions.

2. A fibrous fireproofing-sheet having a series of air-compartments arranged in rows, the compartments of one row being staggered with relation to the compartments of the adjacent rows.

3. A fibrous fireproofing-sheet having a series of air-compartments and alternating contact portions, the air-compartments being connected by a channel.

4. A fibrous fireproofing-sheet having a series of contact portions extending from each side thereof and forming air-compartments at the opposite sides, each of said contacts having a reduced end.

5. A fibrous fireproofing-sheet having a series of channels and a series of air-compartments extending from said channels.

6. A fibrous fireproofing-sheet having a series of parallel channels and a series of air-compartments arranged between said channels.

7. A fibrous fireproofing-sheet having a series of channels, and a series of air-compartments and alternating contact portions between said channels.

8. A fibrous fireproofing-sheet having a series of short corrugations arranged in rows the corrugations of one row being staggered with relation to those of the next row.

9. A fibrous fireproofing-sheet having a series of comparatively short convex contact portions having reduced ends, and alternating concave air-compartments arranged in rows, the air-compartments being connected.

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

CHARLES S. BIRD.

Witnesses:

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JOHN J. SPILLANE.