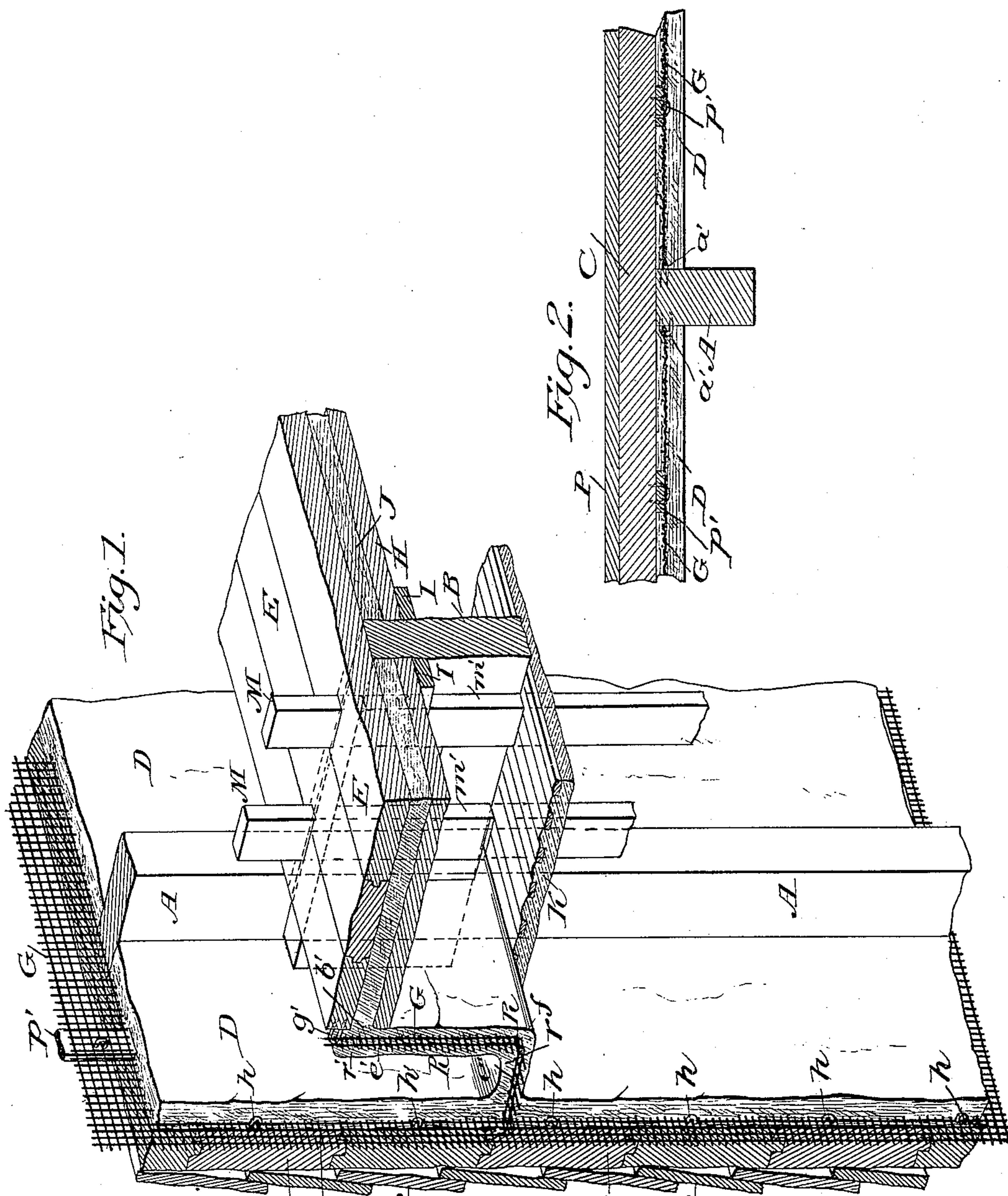


2 Sheets—Sheet 1.

METHOD OF APPLYING NON-CONDUCTING COVERINGS.

No. 466,035.

Patented Dec. 29, 1891.



Witnesses.

Twentor.

John A. Blakey
Charles F. Hayes.

William S. Grubb

(No Model.)

2 Sheets—Sheet 2.

W. S. GRUBB.

METHOD OF APPLYING NON-CONDUCTING COVERINGS.

No. 466,035.

Patented Dec. 29, 1891.

Fig. 3.

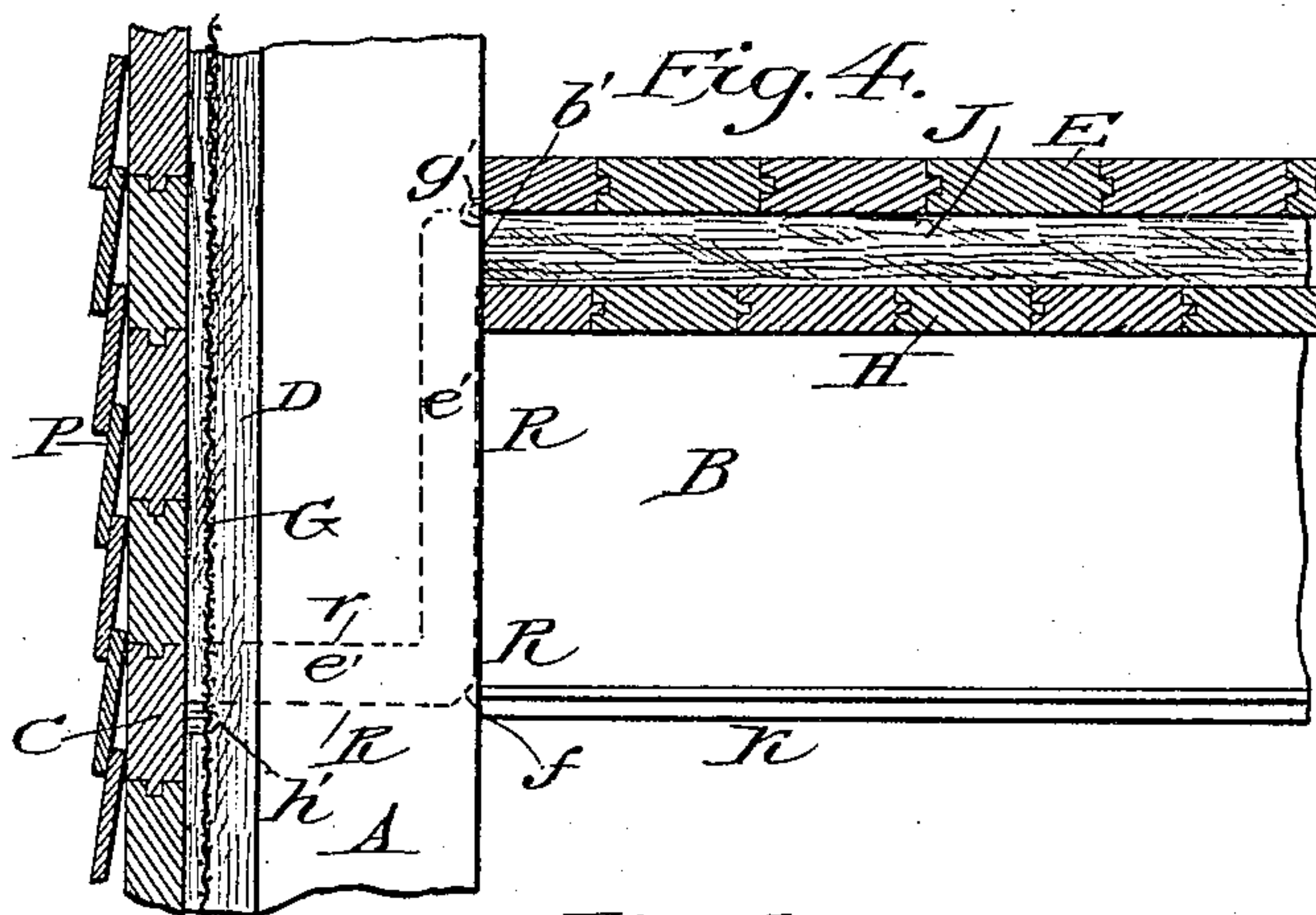
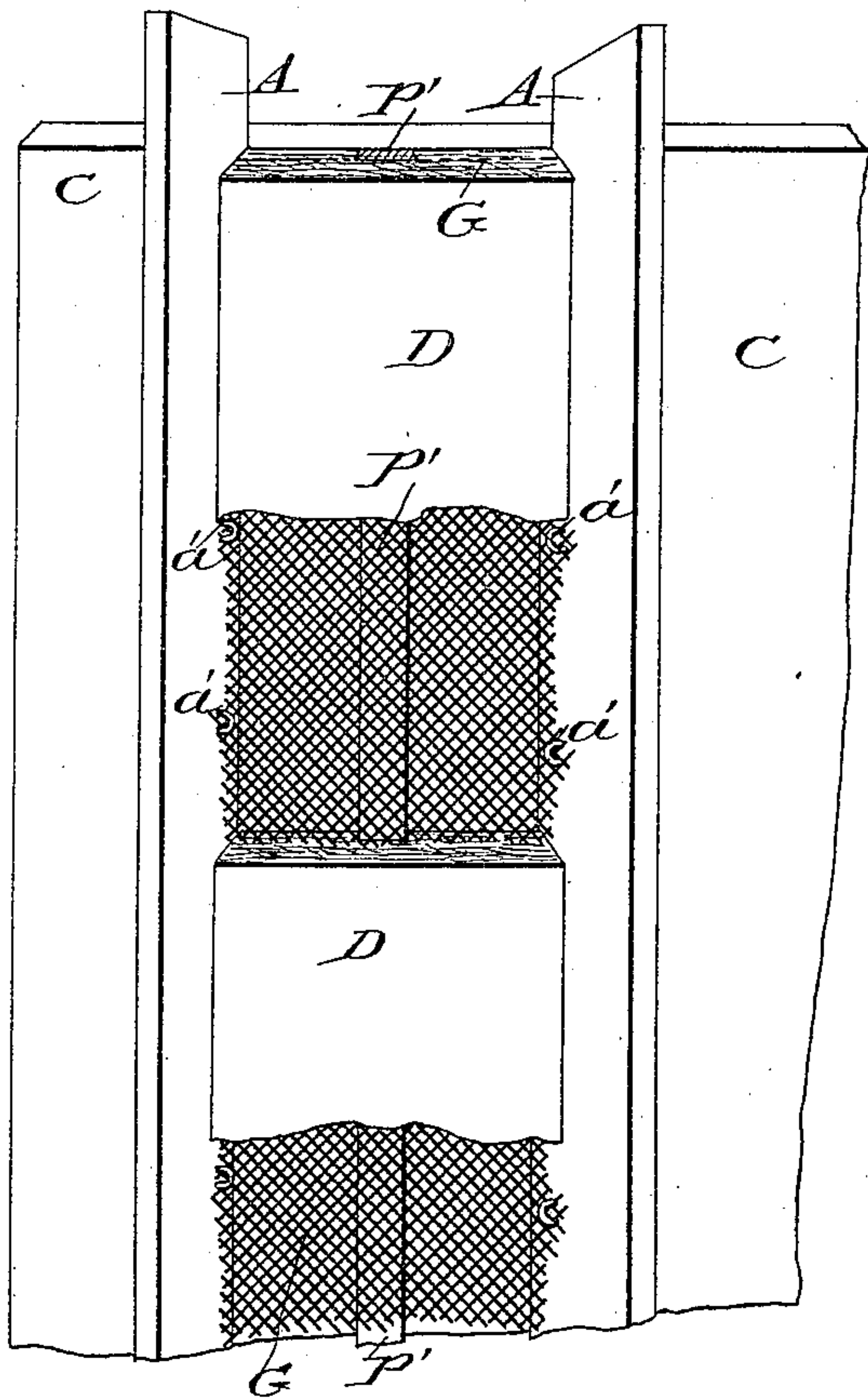
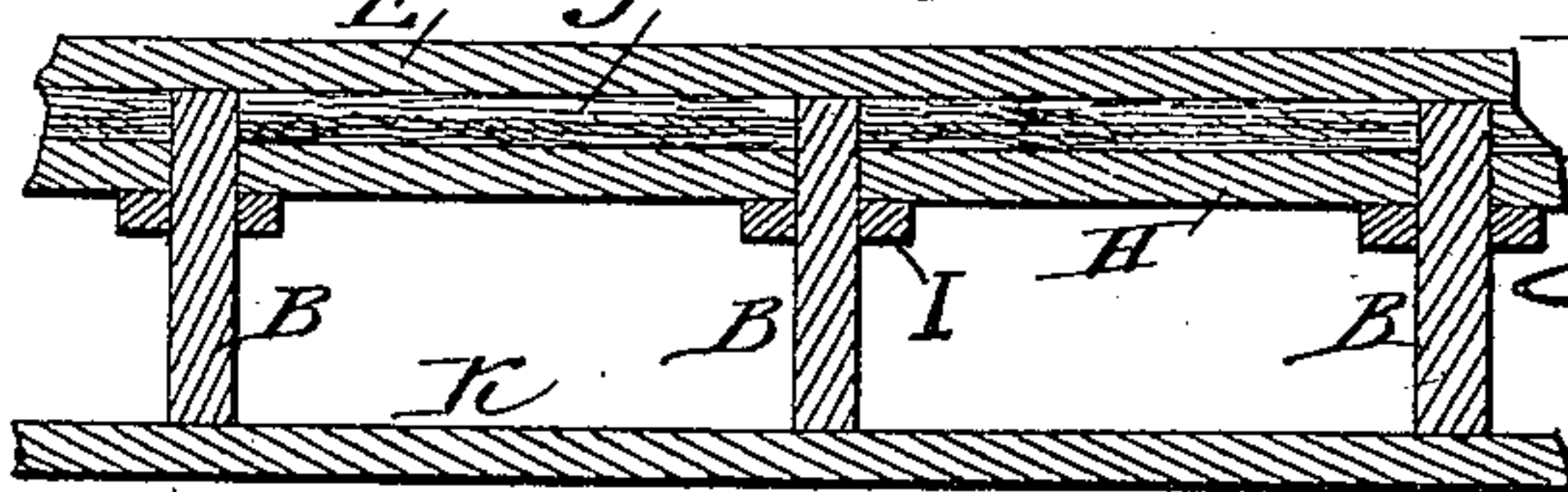


Fig. 5.



Inventor.

William S. Grubb

Witnesses.
John A. Blakely
Charles F. Hayes.

UNITED STATES PATENT OFFICE.

WILLIAM S. GRUBB, OF CHICAGO, ILLINOIS.

METHOD OF APPLYING NON-CONDUCTING COVERINGS.

SPECIFICATION forming part of Letters Patent No. 466,035, dated December 29, 1891.

Application filed July 16, 1891. Serial No. 399,786. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. GRUBB, a citizen of the United States, residing at Chicago, in the State of Illinois, have invented a certain new and useful Improvement in the Method of Applying Non-Conducting Coverings, of which the following is a full and clear description, reference being had to the accompanying drawings, and to letters of reference marked thereon.

Where like letters occur they indicate corresponding parts.

My invention has relation to the application of non-conducting compounds or coverings, applying them mainly in a plastic condition to surfaces exposed to changes of temperature as well as to afford a measurable protection from the spread of fire. Of these coverings there are numerous varieties; but my present invention has relation, preferably, to a class described in Letters Patent No. 302,630, granted to William S. Grubb, for improvement in non-conducting compounds on the 29th day of July, 1884, and in Letters Patent No. 445,358, granted to Frederick Sprinkmann, assignor of one-half to William S. Grubb, for improvements in non-conducting compounds, on the 27th day of January, 1891, or of an analogous class wherein fibrous materials intermixed with plastic and adhesive substances of a practically non-combustible nature predominate. The coverings that I employ are low in cost, light in weight, and therefore cheap in transportation, exceedingly tenacious and adhesive, and can be applied by the most unskilled labor, and therefore a boon to dwellers in bleak and distant regions, where skilled labor is almost unobtainable.

Frame dwellings as ordinarily constructed are really complete "fire-traps," (as exemplified in the construction of the modern and so-styled "balloon frame" in general use,) and seemingly designed as such, being constructed of ordinary scantlings of pine, whether in outside walls or inside partitions, reaching in unbroken continuity from foundations to the roof of the house. At distances corresponding to the various stories of the building are spiked to these scantlings the various floor-joists, the various floors being nailed to the

upper surfaces of these joists, and the various ceiling coats of lath and plaster spread upon the under sides of these joists, and like plaster coatings also spread upon the surfaces of the various partition-walls of the building; and as a result we have between all of the various upright studdings numerous extensive air-channels extending from foundation to roof. We have also between the floor-joists other and larger air-channels reaching across the structure, and at all the points of intersection of floor-joists and studdings, these respective air-channels necessarily open into one another. Should fire occur, these connecting and continuous channels of circulation would inevitably distribute the flames in surprising quickness, enveloping the building and with a result too often painfully demonstrated. With the protection afforded from changes of heat and cold I also propose to afford protection in the various directions of danger thus indicated as existing in buildings of this highly-combustible nature by the spreading upon large surfaces of exposure a covering of these non-conducting and non-combustible materials, and by interposing barriers of the same material between or under floorings, and also by establishing a complete system of "cut-offs" in the connecting air-channels heretofore mentioned.

My invention involves a very considerable reduction in the existing cost of construction of buildings. It dispenses with the necessity of the use of the ordinary sheathing-papers, which are costly and combustible, and also with the extra coat of plastering styled "back plastering," as often spread between studdings in the ordinary frame-house. It is costly and involves the employment of high-priced and skilled labor.

Figure 1 is a perspective view, partly in section, of a portion of the outside wall, floor, and ceiling of a house, showing the relative positions of the various parts employed in my construction. Fig. 2 is a sectional plan view of a portion of an outside wall and one of the supporting-studs. Fig. 3 is a face view of a portion of the wall with my compound applied thereto between the supporting-studs, a portion of which is broken away to exhibit the manner of applying the same. Fig. 4 is

a sectional view of a portion of the wall and floor, and Fig. 5 is a horizontal sectional view of a portion of the floor and ceiling.

Reference is now had to Fig. 1, wherein is shown some of the essential features of the ordinary frame house in cross-section view, A A representing a few of the upright "studdings" of the outside walls. To these studdings are spiked one end of the floor-joists B, (in this instance the floor-joists of the second story.) Upon the upper sides of these joists are nailed the ordinary matched flooring-boards E E, and beneath, the plastered ceiling K. Upon the outside surface of these outside studdings A A are nailed the ordinary common coursing of boards C C, styled "sheathing," the latter co-extensive with the entire outside surface of the house, except where window and door openings intervene. Upon the entire outside surface of this sheathing are nailed the ordinary thin, beveled, and weather-exposed boards P P, styled "siding."

My first act of protection will be to spread upon the entire inside surface of the sheathing C C a suitable thickness of the covering D D, a cross-section view thereof in Fig. 1, as spread between studdings A A.

I have stated that the covering which I employ is singularly adhesive. It can therefore be spread by the most unskilled labor; but there are many instances where desirable results are attained by a slight additional cost. I therefore prefer to use in combination the large-meshed cheap wire-netting, as herein-after set forth. It is procurable in any width, and by its use the material is rapidly spread, and when spread is firmly sustained, and all danger of accidents of contraction or expansion or dislodgment from any cause absolutely avoided. This netting is shown at G G, Fig. 1. In Fig. 2 this wire-netting is shown at G G suspended between studdings A A and at a trifling distance from the surface of the sheathing C, its edges tacked to either side of the studding by the small staples $a' a'$ and also supported in the center by the thin strip of lathing at $p' p'$. My object in thus suspending the netting is that when the plastic covering is spread upon the sheathing C C it shall envelop and inclose the netting and at the same time come into and remain in permanent close contact and adhesion with the surface of the sheathing. This close contact and adhesion is of importance in my method. This adhesion upon the previously and widely exposed surface of the sheathing affords not only desired protection from outside changes of temperature, but also protects from the spread of incipient fires from the inside. A large and exposed surface, composed of highly-combustible materials, has also been protected by a surface of non-combustible covering.

I have hereinbefore alluded to a kind of plastered wall designated as "back-plastering." This is a second or extra wall of the ordinary lath and plaster. It is placed between the

studdings of the outside wall of the house and midway between the inside plastered wall and the sheathing. In contradistinction, my method spreads the covering directly upon the surface of the sheathing, as hereinbefore set forth, and has reference to further important extensions, which will be elucidated hereinafter. I have made particular allusion to the two methods so as to draw the line between the relative positions of the back-plastering as set up in common use and the direct application of material to a surface, the latter in no wise involved in the other method.

I do not expect to render frame buildings absolutely safe from all danger from fire, but to afford protection to a very considerable degree—a protection that will at least in case of an incipient fire afford time to the inmates to escape, to remove valuables, and an opportunity given to extinguish flames. In furtherance of this plan, Fig. 5 represents a cross-section of a portion of a frame house—the floor-joists at B B, the matched flooring thereon at E E, and K K the plastered ceiling beneath. A second course of flooring secured between each corresponding pair of joists B B is shown at H H and upheld by the supporting-strips I I, nailed lengthwise to the joists. These parallel floorings are ordinarily placed about one inch apart for the purpose of receiving between them a filling styled "deadener," a compound of cement and sand. This material has the disadvantage of excessive weight, is a burden to floors, is sonorous, and will crack in case of fire. The filling between floors that I employ is shown in position at J J, and is the same covering that I employ elsewhere. It is light in weight, and being adhesive and tenacious will remain when the other might crumble and fall.

A part of my system is the extension of the flooring H H as laid between joists from outside wall to outside wall of house, and also to extend in unbroken surface the flooring E E from outside walls to outside walls, in both cases with reference to unavoidable obstructions, the filling J J between them in same extension. To accomplish this important part of my general plan it is only necessary that the partition-wall studdings shall be severed at each floor-level. The lengths will then correspond to each story. This severance of studdings permits of the extension as desired of the two floorings with their intermediate layer of covering.

In Fig. 1 the severed studdings M M (of an inside partition-wall) are shown at the dotted lines as resting upon the upper surface of the floor E E of an upper story, while at $m' m'$ are shown the studdings of the same partition-wall their severment from the corresponding studdings above shown in Fig. 1 by the dotted lines as terminating at the lower surface of the flooring E E.

I have now the two separated large bodies of covering D D and J J and I purpose to connect them. I now take a short section of

a suitable sustaining frame-work, but preferably wire-netting R R of the width of the space between two adjacent studdings A A, and attaching one end thereof with small staples *g'* to the outside edge of the flooring E E at the point *g'* I now bend the netting directly downward the width of the joist B B to the point *f*, and then extend it outward at right angles until it meets the surface of the netting G G, where it is secured by staples *h'* to the sheathing-boards C C. The netting or other frame-work R R exactly filling the space between two adjacent studdings, I now spread upon its entire surface a sufficient coat of the covering *e' e'*, the thickness thereof indicated by the dotted lines. In spreading this covering upon the netting R R, I take special care that it shall be united in close union and admixture on the one side with the covering D D and upon the other side in close contact and union with the covering J J, thus welding into homogeneousness of surface the hitherto separated bodies of covering, and having so accomplished the width of one pair of studdings of the outer wall of the house I carry out a similar union of these surfaces at similar points the entire circuit of the building. It may not be amiss to state that by the simple reversal (turning upside down) of the netting R R substantially the same results would be obtained as with it in its present position.

In general summary I now state that I have set forth in full detail my method of insulation; the special advantages of the covering D D, affording, as it does, double protection from fire and cold; the entire outside sheathing of the house; the new and novel extension of the floorings with the extended protection of non-combustible and non-conducting material between; the new and novel severance of partition-studdings and their readjustment to the several stories by replacing and securing the studdings in their proper positions to the flooring; the consequent severance of the long funnels of circulation between them; the very important usefulness of the netting R R with its covering *e'*, and its location at the floor-level, where air-channels

between horizontal joists, where it absolutely severs all circulating-air drafts, whether upward or laterally.

In lieu of circulating-currents spreading in all directions throughout the house, (in winter cold-air currents, every crack between the floor-boards acting as distributors thereof, or in case of fire, a rapid distribution of flames and smoke,) we have created numerous "dead-air" spaces between studdings and between joists, of great value in themselves as non-conductors. Each of these divisions of coverings, valuable in themselves, but united in one comprehensive system, must afford the maximum of benefit, and this has been attained. The cheapness of these coverings permits their application in bodies of considerable thickness. The ease of application is due to wonderful adhesive qualities. Being porous with innumerable small air-chambers, each thoroughly isolated, they are singularly impervious to heat or cold. Without exaggeration it may be said that the ordinary sheathing-paper and the outside wall of ordinary lath and plaster as spread upon the walls of the various rooms of the house and one entire outside surface of sheathing-boards can be dispensed with and greater warmth result by substituting one sufficient surface of the covering spread upon the inside surface of the "siding." To the poorer dwellers in bleak and distant regions the resultant advantages seem apparent.

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

1. The combination of the weather-boarding of frame buildings with a non-conducting covering applied thereto in contact and adhesion therewith, substantially as and for the purpose set forth.

2. The combination of the sustaining frame-work R R and covering thereon, connecting in close union the coverings D D and J J with said coverings, substantially as and for the purpose set forth.

WILLIAM S. GRUBB.

Witnesses:

JOHN A. BLAKELY,
HENRY G. SCHULTE.