Dec. 27, 1927. 1,654,030

H. S. ASHENHURST

SOUND PROOF WALL

Filed March 6, 1926

Fig. 1.

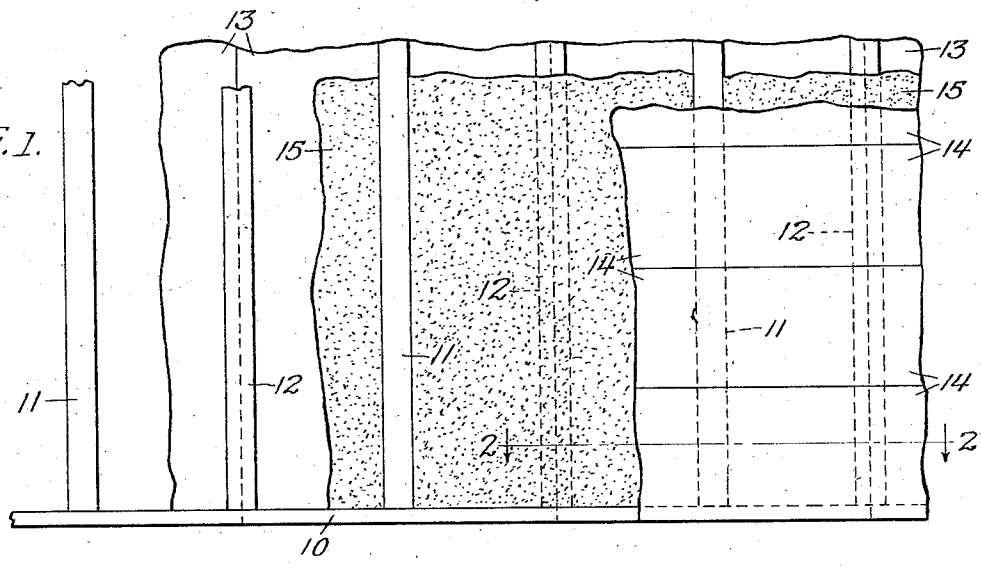


Fig. 2.

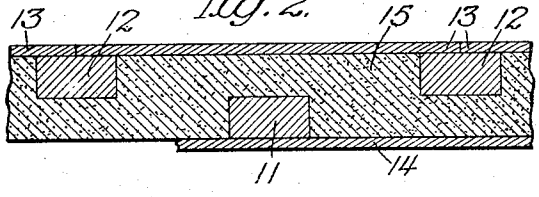


Fig. 3.

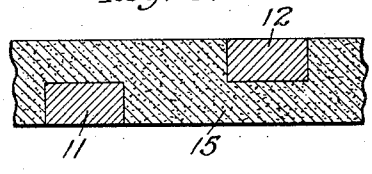


Fig. 4.

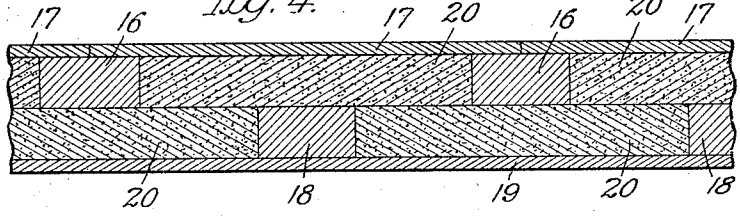


Fig. 5.

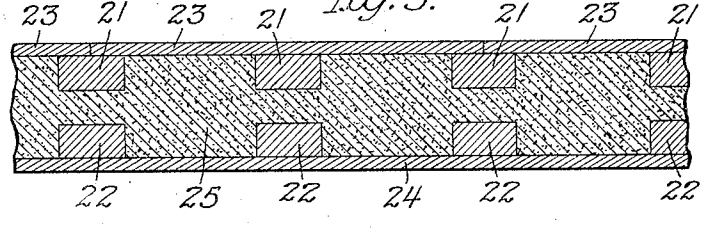
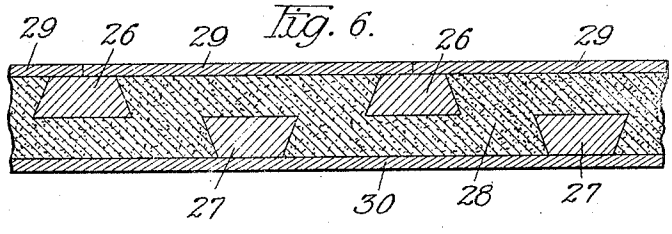


Fig. 6.



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UNITED STATES PATENT OFFICE.

HAROLD S. ASHENHURST, OF CHICAGO, ILLINOIS, ASSIGNOR TO INSULEX CORPORATION, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE.

SOUND-PROOF WALL.

Application filed March 6, 1926. Serial No. 92,691.

My invention relates to sound proof walls and particularly to the type of sound proof wall disclosed by my prior application Serial No. 736,891, filed September 10, 1924, of which prior application the present application is a continuation in part. It is one of the objects of my invention to provide a novel arrangement of parts in a wall for rendering it more nearly sound proof and giving it the maximum efficiency for deadening sound waves and for heat insulation purposes. It is one of the objects of my invention to provide in a wall a combination of elements comprising facing portions and supporting members in spaced relation, in which the opposite facing portions are separated from each other at all points by a layer or layers of porous or cellular material acting to a marked degree as an insulator for sound and heat. It is accordingly one of the objects of my invention to provide a construction of this type in which a portion of the sound deadening material extends across the inner face of each of the supporting members so as to provide that no one of the supporting members extends from one face of the wall to the opposite face. It is another object of my invention to improve walls in sundry details hereinafter pointed out.

The preferred means by which I have accomplished my several objects are illustrated in the drawing and are hereinafter specifically described. That which I believe to be new and desire to cover by this application is set forth in the claims.

In the drawing,—

Fig. 1 is a face view of a wall embodying a form of my invention, partly broken away at various points for better showing the construction and arrangement.

Fig. 2 is a horizontal cross section taken at line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 2 but showing the wall with the facing form members removed.

Figs. 4, 5 and 6 are horizontal cross sectional views through modified forms of structure also embodying my invention.

In the drawing, my invention has been shown embodied in a vertical partition wall. As shown in Fig. 1, the wall comprises a horizontally disposed sill 10 from which rise a plurality of studs 11 along one edge thereof and a plurality of studs 12 along the other edge. On the outer faces of the studs 12, there is secured a facing preferably in the form of sections 13 of wall board or the like, each extending vertically from the sill 10 to the upper edge of the partition. On the outer faces of the studs 11, there is secured a facing preferably in the form of sections 14 of wall board or the like, the sections 14 extending horizontally rather than vertically.

In the formation of the wall shown in Figs. 1, 2 and 3, as produced in the preferred manner, the framework comprising the sill 10 and the studs 11 and 12 is first secured in position. The facing sections 13 are then secured on the outer faces of the studs 12, and the lowermost one of the facing sections 14 is secured on the outer faces of the studs 11. The space between the facing sections 13 and 14 is then filled with a porous cellular material,—preferably with the type of material described in my prior Reissue Patent No. 15,952, granted November 25, 1924. This material is preferably poured into place between the facing sections and permitted to harden in place. After the material has hardened sufficiently to hold its form, a second facing section 14 is secured in position on the outer faces of the studs 11, and the process of filling between the facing sections is repeated. This same step by step progress is continued until the entire wall is formed.

After the completion of the wall, the facing sections 13 and 14 may be retained as permanent parts of the wall, as shown in Fig. 2, or they may be removed in preparation for otherwise completing the faces of the wall, as shown in Fig. 3. In cases where the facing sections are to be removed, horizontally extending sections 14 may if desired be employed on both faces of the wall, or a single horizontally extending portion 14 may be employed at each face, being moved upwardly after each successive pouring operation.

While I prefer to employ the type of porous cellular material as disclosed and claimed in my prior patent as above suggested, it will be understood that I do not desire to limit my invention to the use of this particular material, except to the extent that the same may be specifically claimed. I have, however, obtained very good results by the use of such material, prepared on

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the job by mixing with water a dry mixture of the necessary ingredients, sufficient water being used for making a free-flowing paste which can without trouble be poured between the facing sections 13 and 14 serving as a form for the proper shaping of the body of the wall. I have obtained excellent results with the dry mixture of this type consisting of 100 pounds of calcined gypsum, 2 ounces of commercial retarder, 3¾ pounds of a suitable carbonate, such as calicum carbonate, and 8 pounds of aluminum sulphate containing its water of crystallization, all of such ingredients being finely ground and thoroughly mixed in a dry state.

The material so formed and comprising gypsum as its principal ingredient is highly cellular, weighing only about 18 pounds per cubic foot, and it is found to serve very effectively for deadening sound waves and for insulating the wall with respect to sound and heat. In Figs. 1, 2 and 3, the body of the wall is indicated by the numeral 15.

In Fig. 4, I have shown a wall prepared by a different process. In this construction, studs 16 support a facing member 17, and studs 18 support a facing member 19, the studs 16 being in spaced relation to the member 19, and the studs 18 being in spaced relation with respect to the member 17. The body of the wall is formed of blocks 20 which are pre-cast in accordance with my application Serial No. 12,882, filed March 2, 1925, as a division of my application Serial No. 736,893, filed September 10, 1924, such blocks being made preferably of the same material as that above specified in accordance with my said Reissue Patent No. 15,952. In the construction illustrated, the studs 16 and 18 are spaced at equal distances apart so that precisely similar blocks are capable of being used at the opposite faces of the wall, each block at each face of the wall extending in contact with the inner face of one of the studs at the opposite face of the wall.

In the wall of Fig. 5, the arrangement is the same as that shown in Fig. 2 except that the studs 21 at one face of the wall are opposite the studs 22 at the opposite face, there being a considerable space between the inner faces of the oppositely disposed studs. In this construction, the form sections are indicated by the numerals 23 and 24 respectively, and the body of the wall by the numeral 25.

In the form of wall shown in Fig. 6, the structure is similar to that of Fig. 2 and is produced preferably in the same manner, except that the studs 26 at one face of the wall and the studs 27 at the opposite face of the wall are beveled at both edges, with the edge faces converging toward the outer faces of the studs so as to cause the body 28 of the wall to grip the studs and to hold them rigidly in position, serving thus to strengthen the structure. The form sections of this construction are indicated by the numerals 29 and 30, respectively. As will be appreciated, the construction shown in Fig. 6 comprises in effect a series of blocks at one face of the wall between the studs 26 and another series of blocks at the other face of the wall between the studs 27, such blocks in this construction being formed integrally with each other, however, as compared with the separate block formation as shown in Fig. 4.

In the production of the walls as shown in Figs. 2, 5 and 6, the method of formation as outlined above in connection with Fig. 2 may be employed for the lower portion of the wall and one or more tiers of blocks may be employed if desired for the upper portion of the wall in order to avoid any possible difficulty with respect to pouring the material into place in too close proximity to the ceiling.

As will be appreciated from an examination of the several figures of the drawing, in each of the several constructions of wall, each of the supporting studs has both of its faces which extend transversely of the wall and one of its faces which extend longitudinally of the wall in contact with the porous cellular material forming the body of the wall, with only its outer face open to the atmosphere as in Fig. 3 or in contact with the facing section as in the remaining figures. By reason of the fact that a portion of the body of the wall extends across the inner face of each of the studs, it is, of course, impossible for sound or heat to traverse the wall except as it is able to pass through a substantial portion of the body material.

While I prefer to employ the form of wall structure as shown in one of the figures of my drawing and as above described, it will be understood that I do not wish to limit my invention to the use of such structure except so far as the same is specifically claimed, inasmuch as it is evident that changes might well be made in the form of the structure without departing from the spirit of my invention.

I claim:

1. A wall comprising in combination a plurality of studs having their outer faces positioned to conform to one face of the wall, a plurality of other studs having their outer faces positioned to conform to the other face of the wall, and a body of sound deadening material between the studs and extending across the inner face of each of said studs.

2. A wall comprising in combination a plurality of studs having their outer faces positioned to conform to one face of the wall, a plurality of other studs having their outer faces positioned to conform to the other face

of the wall, and a porous cellular body consisting chiefly of gypsum between the studs and extending across the inner face of each of said studs.

3. A wall comprising a plurality of studs having their outer faces in alignment with each other, a plurality of other studs arranged to alternate with the first-named studs and having their outer faces in alignment with each other in another plane, and a body of sound deadening material between the studs and extending across the inner face of each of said studs.

4. A wall comprising in combination a plurality of studs having their outer faces positioned to conform to one face of the wall, a plurality of other studs having their outer faces positioned to conform to the other face of the wall, and a body of sound deadening material between the studs and extending across the inner faces of the several studs and extending in integral form from one face of the wall to the other face.

5. A wall comprising in combination a plurality of studs having their outer faces positioned to conform to one face of the wall, a plurality of other studs having their outer faces positioned to conform to the other face of the wall, facing members on the outer faces of said studs at each face of the wall, and a porous cellular body cosisting chiefly of gypsum between said facing members and comprising integral portions extending across the inner faces of the several studs.

6. A wall comprising in combination a body of sound deadening material and a plurality of supporting members each completely buried in said body except for one of the faces thereof extending longitudinally of the wall, each of which longitudinally extending faces is flush with one of the outer faces of the body.

7. A wall comprising in combination a plurality of studs having their outer faces positioned to conform to one face of the wall, each of said studs having its edge faces converging toward its outer face, and a body of sound deadening material extending between the studs in contact with the edge faces and the inner face of each of the studs so as to grip the studs and hold them rigidly in position in the wall.

8. A wall comprising in combination a plurality of studs having their outer faces positioned to conform to one face of the wall, a plurality of other studs having their outer faces positioned to conform to the other face of the wall, facing members secure on the outer faces of said studs at each face of the wall, each of said studs having its edge faces converging toward its outer face, and a body of sound deadening material extending between the studs in contact with the edge faces and the inner face of each of the studs so as to grip the studs and to hold the facing members rigidly in fixed spaced position with respect to each other.

9. A wall comprising in combination a plurality of studs having their outer faces in alignment with each other at one face of the wall, a plurality of other studs arranged to alternate with the first-named studs and having their outer faces in alignment with each other at the other face of the wall, all of said studs having their inner faces in alignment with each other, and a body of sound deadening material between the studs and extending across the inner face of each of the studs.

10. A wall comprising in combination a plurality of studs having their outer faces in alignment with each other at one face of the wall, a plurality of other studs arranged to alternate with the first-named studs and having their outer faces in alignment with each other at the other face of the wall, all of said studs having their inner faces in alignment with each other, and a body of sound deadening material comprising a plurality of blocks between the studs, each block being in contact with the adjacent faces of the studs at one face of the wall and extending across the inner face of the intermediate stud at the opposite face of the wall.

11. A wall comprising in combination a plurality of studs having their outer faces positioned to conform to one face of the wall, a plurality of other studs having their outer faces positioned to conform to the other face of the wall, and a body of sound deadening material comprising a plurality of blocks between the studs, each block being in contact with the adjacent faces of the studs at one face of the wall and extending across the inner face of the intermediate stud at the opposite face of the wall.

12. A sound proof wall comprising in combination structural elements in staggered relation, and cellular insulating material located between the adjacent faces of alternate structural elements and overlying the inside face of the intermediate structural element.

13. A sound proof wall comprising in combination studs arranged at opposite faces of the wall in staggered relation to each other, and a body of sound deadening material comprising a plurality of blocks between the studs, each block being in contact with the adjacent faces of the studs at one face of the wall and extending across the inner face of the intermediate stud at the opposite face of the wall.

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