

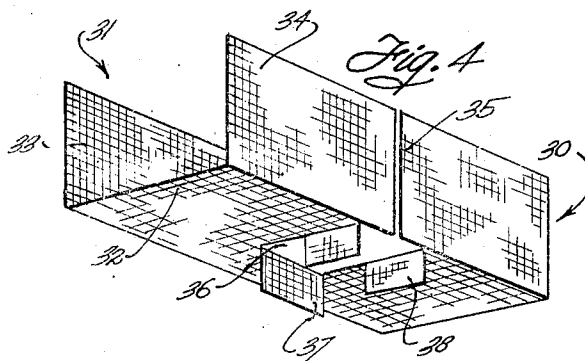
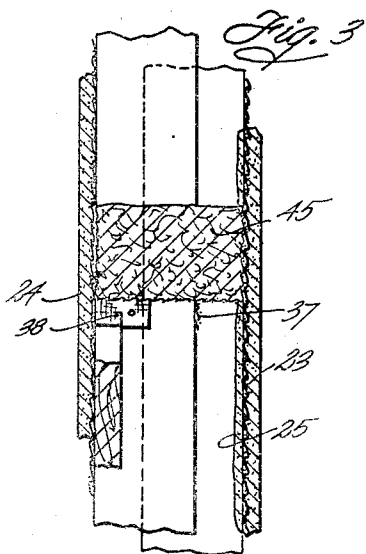
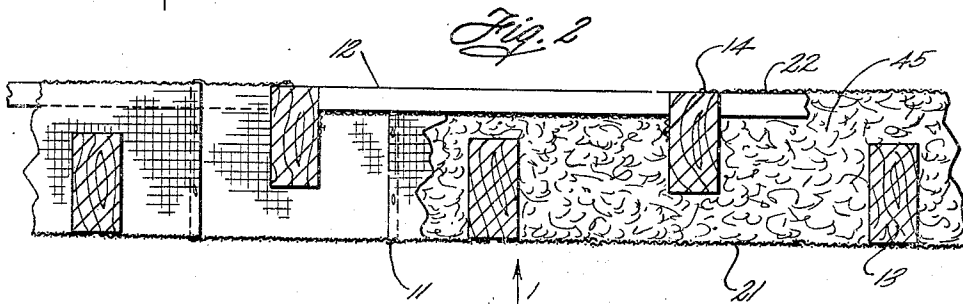
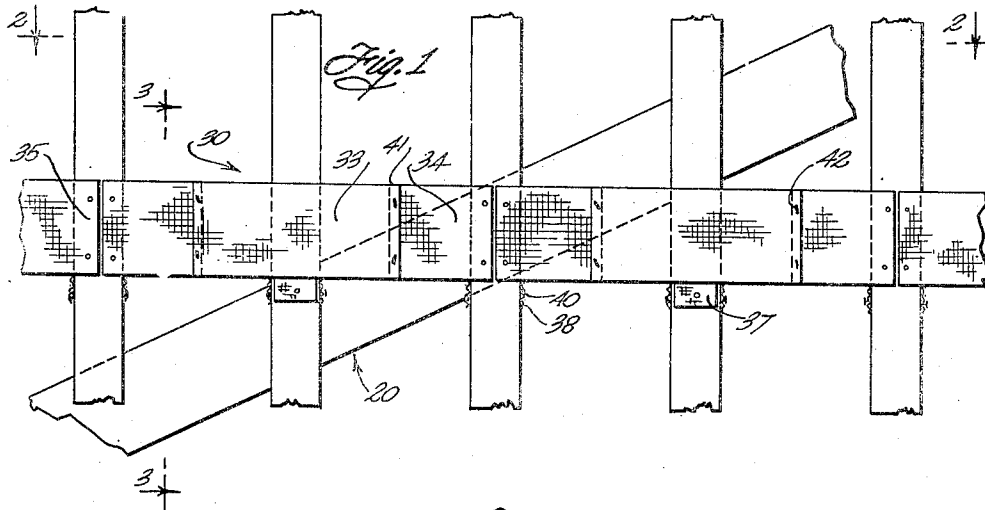
Feb. 8, 1944.

C. L. WOODWORTH

2,341,305

SOUND DEADENING WALL CONSTRUCTION

Filed Oct. 16, 1940



Inventor
CARROLL L. WOODWORTH
By Hazard and Miller
Attorneys

UNITED STATES PATENT OFFICE

2,341,305

SOUND DEADENING WALL CONSTRUCTION

Carroll L. Woodworth, Pasadena, Calif., assignor
to Gladding, McBean & Co., Los Angeles, Calif.,
a corporation of California

Application October 16, 1940, Serial No. 361,339

3 Claims. (Cl. 72-16)

My invention relates particularly to an improvement in a sound absorbing or sound deadening wall of the stud and plaster type. This type of wall construction is quite common and in many localities the least expensive. In certain of the attempts to absorb or deaden sound transmission in this stud and plaster type of wall, the studs have been arranged in a staggered manner, however in many localities building ordinances or the like require the use of a fire stop which generally is made of wood, the fire stops fitting in the space between adjacent studs and between the back or inside faces of the plaster. They thus completely shut off any updrafts of air in the space between the studs and the plaster and hence derive the name of fire stops for restricting the development of fire due to the updraft were the fire stop omitted.

However it has been found that the wood of the fire stop itself is an excellent sound conductor. The reason for making the sound absorbent walls with the staggered studs is to avoid a direct connection of wood between one plaster wall and the other and hence by leaving air spaces provide for the absorption of sound. However, where the fire stop of the conventional type is built into a stud and plaster wall either of the conventional or the staggered stud type, so much sound is conducted directly through the wood of the fire stop that the purpose of sound proofing is largely defeated.

An object of my invention is to increase the sound absorption and deadening characters of a stud and plaster type of wall by substituting for the conventional wood fire stop a fire stop formed of material resistant to fire and which will also effectively prevent the updraft of air and have the additional characteristic of being a good sound absorbing material in itself. Manifestly many solid fire proof materials could be built into a wall between the studs and the inside of the plaster which would prevent an updraft but many of these materials still have the character of being good sound conductors although they may prevent the updraft of air and be in themselves fire proof.

In my invention therefore in forming a fire stop which prevents the updraft of air and absorbs sound, I form an elongated channel shaped basket preferably made of wire or metal fabric. This is secured to the studs and fits in the space between the studs and the inside of the plaster. This channel type basket is then filled with material having the characteristic of absorbing or deadening sounds and being sufficiently closely

packed to prevent the updraft of air. In addition my preferred filling materials are in themselves fire proof. I find that a satisfactory material for this purpose is vermiculite of varying sizes of granules.

My invention also comprehends a type of basket and especially a channel basket suitable for staggered stud construction for which purpose a series of short baskets each have a vertical slit and a flanged opening in the bottom, the slit permitting fitting over a stud and the flanged opening accommodating the vertical stud. The basket is then nailed to the stud at the overlapping sides and the flanges. These short channels are constructed overlapping and attached by lacing or wires at the overlap. This construction therefore may be used to form a horizontal channel from one end of the wall to the other completely obstructing the spaces between the studs and between the inside of the plaster or other walls. The filling of vermiculite or other material may be of the desired depth in the basket to give sufficient resistance to an upward draft of air, resistance to fire and have the desired sound absorbing qualities. Incidentally this type of filling possesses good heat insulating qualities.

Another characteristic of my invention particularly as it relates to the staggered stud type of wall includes building the diagonal bracing of comparatively thin wood in comparison with the studs and located to intersect alternate studs adjacent their outer edge, thus leaving a space between the inside of the brace and the studs on the other side of the wall, hence the diagonal brace has no contact with the wood stud structure in a manner which might give a continuous wood sound transmission structure from one wall to the other.

A further characteristic of the channel basket is that in my preferred construction this is made of an open mesh wire fabric which in itself has poor sound conducting characteristics. Therefore when filled with a sound absorbent material the passage of sounds both transversely and vertically in the partition is either eliminated or greatly reduced. Another characteristic of the basket is that this may be shaped to accommodate pipes or conduits in the partition and these may readily pass through the basket and the filling.

My invention is illustrated in connection with the accompanying drawing, in which:

Fig. 1 is a side elevation partly broken away of a stud and plaster type of wall as if taken in the direction of the arrow 1 of Fig. 2.

Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1 in the direction of the arrows.

Fig. 3 is a vertical section taken on the line 3—3 of Fig. 1 in the direction of the arrows.

Fig. 4 is a perspective view of one of the baskets

to hold the fire stop forming material. My invention is illustrated in connection with a staggered stud type of wall or partition in which for sake of convenience one side of the wall 11 is designated as the front and the opposite side 12 as the rear. There is a first series of wood studs 13 contiguous to the front side of the wall and the second series 14 contiguous to the rear side. Presuming these studs are made of standard size as 2" x 4" or any other typical dimensions they are arranged in a staggered manner so that none of the studs extend the full distance between the front and the back of the wall or partition. The illustration does not show the floor support or the ceiling cap of the studs as such is immaterial to my invention. A diagonal brace 20 is illustrated as intersecting the studs and for this purpose the studs are preferably cut to accommodate the brace at the intersections, the brace being illustrated as extending across the studs 14 of the rear side row. In order to restrict sound transmission through the brace, the brace is made thinner than the space between the front line studs 13 and the rear side of the wall. On the front side and secured to the front studs 13 there is a lath structure 21 and on the opposite side a similar lath structure 22. Both of these have a plaster coat indicated at 23 on the front and 24 on the rear side. This plaster is made of a material in which a fair proportion 25 is forced inwardly through the lath which is preferably of a metal type and as the main body of the plaster is a sound absorbent and sound deadening character, this portion 25 inside of the lath also acts as a sound deadener, or absorber.

The metal baskets for the fire proof and sound restrictive fire stop are designated by the numeral 30, note Fig. 4. These are in the form of a channel 31 having a web 32 and two opposite upstanding sides 33 and 34. One of these sides is vertically divided as at 35 near the middle. The web 32 at the bottom has a flanged opening 36 which is made of the desired size to accommodate the stud. The flanges of this opening are indicated at 37 and 38 and these are adapted to be positioned against the sides of the stud. All parts of each basket are preferably integrally formed and the length of each basket is preferably approximately equal or slightly in excess of the distance between adjacent studs.

The baskets are applied to their respective studs so that the vertical divisions 35 are positioned against the outer sides of their studs as illustrated in Fig. 2. The baskets being formed of wire mesh or the like can be sprung open so as to separate the sides of the vertical divisions 35 and pass them around the studs so that the studs will be positioned in and substantially completely fill the openings 36. Securing devices such as nails 40 can be driven through the flanges 37 and 38 into the studs and nails can be driven through the upstanding side 34 into the stud adjacent the vertical division 35. The lengths of the baskets are such that they overlap as indicated at 41, see Fig. 1, and the overlapping portions are secured together such as by wire laces 42 or the equivalent. The installed baskets cooperate to form a channel or trough extending horizontally the full length of the wall or par-

tion and form the outer side of one row of studs to the outer side of the opposite row of studs. Opposite the diagonal brace 20 the upstanding sides are distorted or are pressed inwardly as shown on Fig. 2 so that in the locality of the brace the fire stop may be somewhat narrower than elsewhere.

In order to complete the fire stop the basket is filled with a packing 45 which may be of any suitable material sufficiently dense when in the basket to prevent an upward draft of air. It is preferable also that the material be fireproof, and a poor conductor or transmitter of sound. I find vermiculite quite satisfactory for this purpose. The basket or trough may be filled with this or like material in granular form. It does not need to be packed nor to be bound in any manner. This construction therefore forms an effective air seal, longitudinally of the partition or wall. It prevents upward drafts of air which might aid the combustion of a fire and hence forms an efficient fire stop.

It will therefore be seen that my invention provides a satisfactory and yet inexpensive transverse member producing the fire stop in a stud and plaster type of wall. No wood directly connects one face of the wall to the other and hence the sound transmission through the wall is restricted. Air spaces are left above and below the fire stop but this dead air has been found to be an excellent sound absorbent. The loose material in the channel baskets also having a sound deadening character, my construction has a more efficient sound deadening character than walls equipped with the conventional fire stops. In order to make an efficient sound deadening wall I prefer to use a plaster having good sound absorbent characteristics and for this purpose have used with satisfaction a material known in the trade as Kalite. I preferably lay the Kalite plaster on the lath in such a manner that there is quite a thick covering 25 inside of the metal lath. This has the characteristic of deadening any sounds which might arise within the partition, such as those arising from pipes or conduits or the like which may be disposed within the partition or wall.

As above mentioned, the channel basket is preferably made of a wire mesh fabric which in itself has poor sound conducting characteristics. While I have described the use of vermiculite as a filling, other materials may be utilized such as fibrous asbestos, rock wool, slag wool or glass wool either in fibrous or nodulated form. Another sound deadening characteristic of my form of partition is that I preferably have a thick coating of plaster indicated at 25 on the inside of the lath. This is made of the same composition as the outer or face coatings of plaster. The portion 25 on the inside acts as a sound absorber for sounds developed within the partition, such as arising from pipes, conduits or the like and which thus operates to absorb sounds passing up, down or lengthwise of the partition and also with the outside coating, absorbs sounds having a traversing path of such partition. I have designated as a suitable plaster that known in the trade as Kalite which includes pumice in its composition but other plasters of suitable sound absorbing qualities are adapted for the plaster coat.

Various changes may be made in the details of the construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. A wall construction comprising inner and outer rows of studs arranged so that the inner sides of the studs of one row extend short of the outer sides of the studs of the other row, the studs of one row being staggered with relation to the studs of the other row, supporting means encircling each stud and extending therefrom to the outer side of the opposed row of studs, said supporting means cooperating to form a continuous support between the studs, and fireproof material supported on said supporting means providing a fire stop.

2. A wall construction comprising inner and outer rows of studs arranged so that the inner sides of the studs of one row extend short of the outer sides of the studs of the other row, the studs of one row being staggered with relation to the studs of the other row, metal fabric bas-

kets secured to their respective studs cooperatively bridging the space between the outer sides of the rows of studs, and fireproof material supported on the baskets providing a fire stop.

5 3. A wall construction comprising inner and outer rows of studs arranged so that the inner sides of the studs of one row extend short of the outer sides of the studs of the other row, the studs of one row being staggered with relation to the studs of the other row, and metal fabric
10 baskets secured to their respective studs, each basket having an opening in its bottom adjacent one side thereof to receive its respective stud, the baskets cooperatively bridging the space between the outer sides of the rows of studs, and
15 fireproof material supported by the baskets providing a fire stop.

CARROLL L. WOODWORTH.