Dec. 13, 1932. B. E. BALDUF 1,891,189

SOUND INSULATING FLOOR CONSTRUCTION

Filed Aug. 11, 1930

Fig. 1

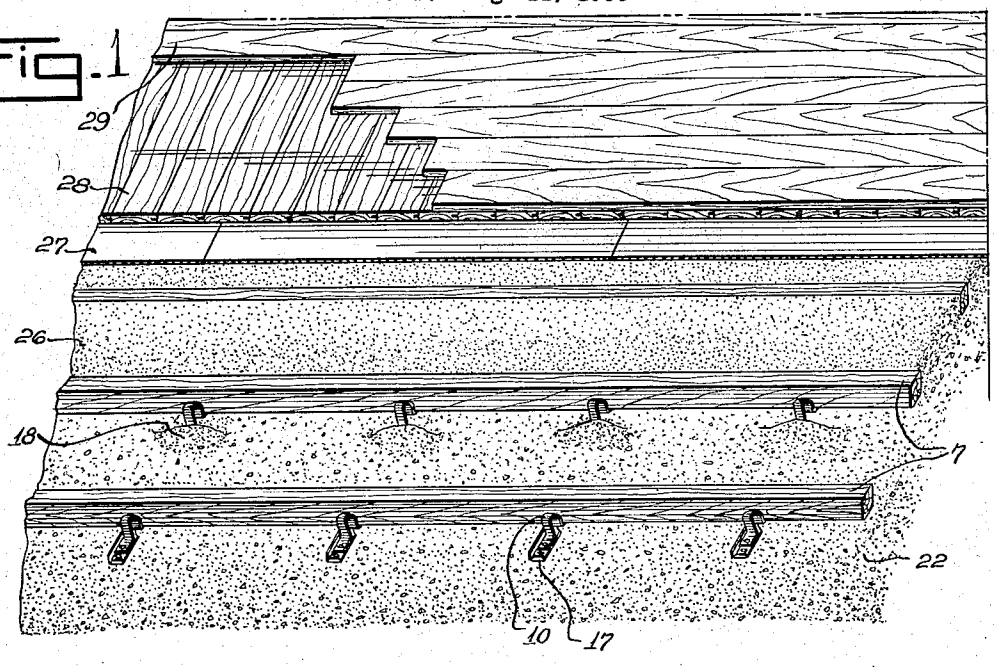


Fig. 2

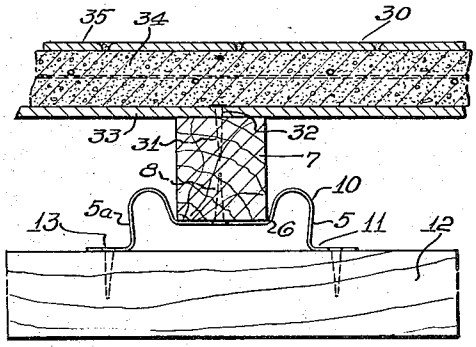


Fig. 3

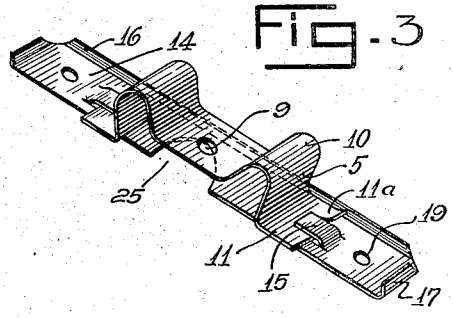
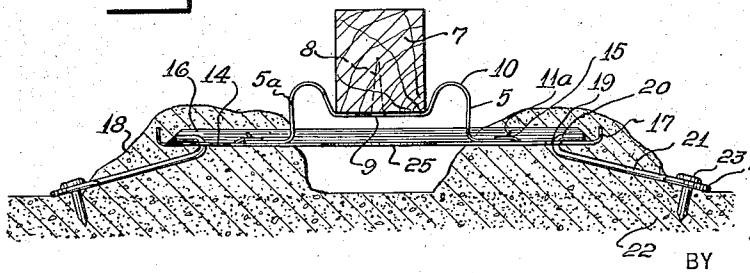


Fig. 4



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SOUND INSULATING FLOOR CONSTRUCTION

Application filed August 11, 1930. Serial No. 474,387.

This invention relates in general to a sound insulation construction for the floors of buildings for the purpose of minimizing the transmission of sound therethrough.

A particular object of this invention is the provision of a durable and yieldable metal support for connecting adjacent parts of floors and deadening sound and vibrations received thereon.

Another object of this invention is the provision of a sound insulating construction adapted to receive vibrations and to distribute them uniformly over an extensive area by means of metal supports which yield longitudinally as well as laterally.

A further object of this invention is the provision of an easily assembled sound insulating clip especially adapted for supporting a wooden floor above a cementitious base.

A still further object is the provision of anchoring means for holding a spring sound insulating clip securely in a concrete base; also to improve sound insulating constructions in other respects hereinafter specified and claimed.

Reference is to be had to the accompanying drawing forming a part of this specification, in which

Fig. 1 is a view of spring metal clips in a plastic base with sleepers resting thereon, showing the steps of construction from the time they are put in place until the floor is completed and the floor boards laid in place.

Fig. 2 is a cross sectional view of a spring metal clip attached to a wooden base, a wooden sleeper resting thereon and attached thereto, and a tile floor construction resting on the sleeper, and

Fig. 3 is a view of a spring metal clip set on a metal grouting plate for application to a cementitious base, and

Fig. 4 is a cross sectional view of Fig. 1, showing the clip in place on a concrete base and anchored thereto.

In my improved sound insulating construction, resilient impact absorbers are placed between the main floor and sub-floor to prevent the transmission of sound energy and vibratory movements from one room to another. The spring clips used in my construction are sufficiently resilient to absorb sound waves impinging on the adjacent building construction, and yet are of sufficient strength to support the main floor without permitting it to come in direct contact with the building construction adjacent and in close relation thereto. A detachable grouting plate fitted with integral lugs for the purpose of attaching a spring clip thereto, permits the use of the same clip interchangeably on either a wooden base or a cementitious base. A nailing cut-out in the grouting plate permits the fastening of the metal clips to the sleepers in position in the room under construction and is a time and labor saver in assembly.

A metal clip 5 of any desired width is shaped to form a flat central saddle portion 6 adapted to carry a sleeper or nailing strip 7 and is secured by a nail or other fastening means 8 which is driven through the perforation 9 in the saddle 6 to hold it rigidly in position. Opposite resilient loops 10 extend upwardly and outwardly from the central saddle portion 6 so that the adjacent sides of said loops are free from contact with the sleeper 7 and will not hinder the action of the springs or cause rubbing or squeaking sounds. The spring legs 5*a* extend at a slight angle to the perpendicular so as to permit free lateral as well as perpendicular flexing of the clips. Two parallel outstanding flanges 11 rest flat on a wooden base or joists 12 (Fig. 2) and are secured thereto by means of nails or other fastening means 13.

In attaching metal clip 5 to a plastic base, I use a grouting plate 14 provided with integral lugs 15 under which are inserted the outstanding flanges 11 of clip 5. A slit is provided in each outstanding flange 11 so as to form a narrow lug 11*a* which is bent slightly upwardly so as to lie somewhat about the plane of the flanges 11. When inserting the flanges 11 beneath the lug 15, the lugs 11*a* are manually depressed and upon clearing the lugs 15, the lugs 11*a* again spring upwardly to lock the spring clip to the grouting plate. This grouting plate 14 has a side flange 16 extending the length thereof to further stiffen the grouting plate 14 and prevent it from buckling or sagging. This flange also serves

as a stop for the locking lugs 11*a*. End flange 17 of grouting plate 14 serves to bond the grouting plate to the grouting material 18 (Fig. 4). Perforations 19 in the opposite ends of grouting plate 14 are adapted to receive a hook 20 of an anchoring member 21. The anchoring member 21 extends downwardly at an angle to grouting plate 14 and is secured to a gypsum or concrete base 22 by means of a nail or other fastening means 23 extending through loop 24. A semi-circular opening 25 is formed near the center of grouting plate 14 and directly below the perforation 9 in the saddle 6. This semi-circular opening 25 provides clearance so that the sleepers 7 can be fastened to the saddle 6 of clip 5 after the grouting plate 14 has been attached, by driving the nail 8 into place with a hammer.

In assembling my floor structure the nailing strips 7 are laid on the floor 22 and the clips 5 on grouting plates 14 are nailed in position at intervals along the strip 7 by operating a hammer through the clearance of opening 25. Batches of grouting material 18, such as a mixture of calcined gypsum and water, are placed on the floor 22 at the positions to be occupied by the grouting plates 14 and the anchor hooks 20 are placed through the plate openings 19. The strip 7 is then turned over and the plates 14 placed with their ends resting on the grouting material 18. Nails 23 are now driven into the floor 22 through anchor loops 24 and the grouting material is formed up over the anchor members 21 and the ends of the grouting plates 14 and allowed to set. If desired, a light weight filling material 26 consisting of a mixture of gypsum and 7 to 25% of paper fibers is now poured between the strips 7 to aid in making a soundproof construction and to damp the vibrations of the spring clips 5 due to impact sounds or other forces on the main floor. Paper sheets 27 are then laid on top of the strips 7 to retain the filling material 26 in place and prevent it from blowing around. The rough floor boards 28 are nailed to strips 7 over the paper 27 and the finish floor boards 29 are nailed in place over the rough boards 28, the rough boards and finish boards forming the main floor.

If desired, a tile floor construction 30 may be fastened to nailing strips 7 by a nail or other fastening means 31 through a perforation 32 in a furring sheet 33 of plaster board, metal lath, etc. A cementitious material 34 is poured in place over the furring sheet 33 and tiles 35 rest thereon forming the surface of the floor construction. This type of floor construction prevents cracks from forming in the tile surface 35 or the cementitious layer 34 due to warping or distortion of the joists 12.

My improved sound insulating construction has distinct advantages over other constructions in that it cuts down the sleeper height and thus allows for a narrower space between the main floor and sub-floor. By the use of the integral lugs on the grouting plate, clips of different sizes may be used and the same clip may be used interchangeable on a wooden base or on a cementitious base. This eliminates the necessity of keeping several kinds of clips in stock. The simple fastening means for securing the clips to building framework reduces the cost of application approximately 75% thus reducing the general cost of insulation construction to a very material extent.

My improved sound insulating construction is far superior to constructions in which felt or other fibrous material is used for the absorption of sound, since fibrous material tends to pack and settle and thereby loses some or all of its sound absorbing quality. My construction remains constantly flexible and resilient and will support heavy loads without bending or sagging to an appreciable extent. My metal clip is resilient and will yield slightly to sound waves and vibration with a snubbing or dispersing action but returns to its original position after each impact. These qualities make my construction suitable for use with a tile floor without danger of cracking or spreading of the tiles.

I would state in conclusion that while the illustrated examples constitute practical embodiments of my invention, I do not wish to limit myself precisely to these details, since manifestly the same may be considerably varied without departing from the spirit of the invention as defined in the appended claims.

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

1. A resilient sound absorber comprising a metal clip having a flat central portion, integral resilient loops extending upwardly and outwardly at an angle to said central portion, flanges extending from said loops parallel to and in a plane below the flat central portion, and a portion of said flanges slotted and bent out of the plane of said flanges to form a lug adapted to interlock with a grouting attachment.

2. A resilient sound reducing construction comprising a metal clip having extending slotted flanges, a portion of said flange adjacent the slot being bent from the metal of the flange to form an integral lug adapted to interlock with a grouting plate, and a grouting plate having oppositely disposed integral lugs extending over and interlocking with the lugs of said flanges.

3. A resilient sound absorbing construction comprising a resilient metal clip having extending flanges, a slot in said flange, a portion of said flange adjacent said slot being raised to form an integral lug formed from the metal of the flange and adapted to in-

terlock with a grouting plate, a grouting plate having integral lugs extending over and interlocking with said flanges, and upstanding lugs on oppositely disposed extremities of said grouting plate adapted to engage grouting material.

4. A sound reducing construction comprising a resilient metal clip having extending flanges, a slot in said flange, a portion of said flange being raised to form an integral lug formed from the metal of the flange and adapted to interlock with a grouting plate, a grouting plate having integral lugs extending over and interlocking with said flanges, and an upstanding reinforcing flange on an edge of said grouting plate.

5. A resilient sound insulating construction comprising a cementitious base, grouting plates resting therein and attached thereto in spaced relation, resilient metal clips interlocking with said grouting plates, sleepers resting on a flat central portion of said clips, cementitious floor supported by said sleepers, a light, flocculent insulating material poured around said clips and sleepers, and a fibrous sheet adjacent the under portion of said floor and adapted to hold said insulating material in place.

6. A spring floor support, comprising a grouting plate, a pair of oppositely disposed outstanding integral lugs formed on said grouting plate from the metal of said plate, and a flat spring having outstanding ends engaging said lugs.

7. A supporting device, comprising a grouting plate, a pair of oppositely disposed outstanding integral lugs formed on said grouting plate from the metal of said plate, a flat spring having outstanding ends engaging said lugs, and reinforcing flanges formed on said plate.

8. In a resilient sound absorber for floor constructions, a resilient metal clip having a flat central portion, integral resilient loops extending upwardly and outwardly at an angle to said central portion, flanges extending outwardly from said loops parallel to and in a plane below said flat central portion, and a grouting plate secured to said flanges, said grouting plate being provided with a clearance opening directly below said central portion so as to permit nailing of said central portion to a sleeper resting upon said central portion,

9. A resilient supporting device, comprising a relatively rigid metal base member having a pair of projecting portions integrally formed from the metal thereof, and a flat spring having its end portions lying in a horizontal plane and engaging said projecting portions of said base member.

10. A resilient supporting device, comprising a relatively rigid metal base member having a pair of projecting portions integrally formed from the metal thereof, and a flat spring having its end portions lying in a horizontal plane and engaging said projecting portions of said base member, and having an intermediate portion also lying in a horizontal plane and resilient portions connecting said intermediate and end portions and projecting above the plane of said intermediate portion.

11. A resilient supporting device, comprising a metal upper member having a substantially horizontally extending central portion, an integral resilient portion at each end of said central portion, the portions thereof contiguous to said central portion extending from the latter in a general upward direction and other portions of said resilient portions being bent to extend in a general downward direction and then in a substantially horizontal plane, and a lower member connected to said upper member at said last-mentioned substantially horizontally extending portions thereof, and having its intermediate portion spaced a substantial distance below said central portion of said upper member.

12. A resilient supporting device, comprising a metal upper member having substantially horizontally extending central and end portions, integral resilient portions respectively connecting said end portions with said central portion, the portions of said connecting portions contiguous to said central portion extending from the latter in a general upward direction and other portions of said connecting portions being bent to extend in a general downward direction to the junctions with said end portions, and a lower member connected to said end portions of said upper member and having its intermediate portion spaced a substantial distance below said central portion of said upper member.

13. A resilient supporting device, comprising a metal upper member having a substantially horizontally extending central portion, an integral resilient portion at each end of said central portion, the portions thereof contiguous to said central portion extending from the latter in a general upward direction and other portions of said resilient portions being bent to extend in a general downward direction and then in a substantially horizontal plane, and a relatively rigid metal lower member connected to said upper member at said last-mentioned substantially horizontally extending portions thereof, and having its intermediate portion spaced a substantial distance below said central portion of said upper member.

14. A resilent supporting device, comprising a metal upper member having substantially horizontally extending central and end portions, integral resilient portions respectively connecting said end portions with said central portion, the portions of said connect-

ink portions contiguous to said central portion extending from the latter in a general upward direction and other portions of said connecting portions being bent to extend in a general downward direction to the junctions with said end portions, and a relatively rigid metal lower member connected to said end portions of said upper member and having its intermediate portion spaced a substantial distance below said central portion of said upper member.

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