ACOUSTICAL AND FIRESTOP RATED TRACK FOR WALL ASSEMBLIES HAVING RESILIENT CHANNEL MEMBERS

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ABSTRACT
Metal profiles used as top and bottom tracks with legs spaced apart a width to accommodate wall stud framing and resilient channel attached to at least one side of the stud framing. One of the profile legs having a minimum of one return flange aiding in holding studs in place during construction and assembly life cycle. Intumescent material attached to a portion of at least one of the legs located proximate to the overhead (ceiling) structure or floor structure. Profiles are used to provide stud support, drywall edge support, fire stop protection at intersection joints, and accommodate the buildup of resilient channel used in the wall assembly. All in one piece is installed at one time saving labor, materials, replacing limited caulk type materials used and eliminating installation defects typical in current construction methods.
Fig. 2
(Prior Art)
Fig. 14
ACOUSTICAL AND FIRESTOP RATED TRACK FOR WALL ASSEMBLIES HAVING RESILIENT CHANNEL MEMBERS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of priority to U.S. Provisional Application No. 61/284,395 filed on Dec. 18, 2009, and U.S. Provisional Application No. 61/284,396 filed on Dec. 18, 2009, all of which applications are incorporated herein by reference in their entireties for all purposes.

TECHNICAL FIELD

[0002] The present invention relates generally to wall assemblies and, more particularly, to wall assemblies having a plurality of Resilient Channel (RC) members attached lengthwise to the wall studs of a newly constructed wall assembly. The track component of the present invention is especially adapted for use in acoustical partitioning, and in some embodiments also functions as a firestop for containment of smoke and fire.

BACKGROUND OF THE INVENTION

[0003] Metal framing assemblies used to construct commercial and residential buildings are common in the building construction arts. These metal framing assemblies are generally constructed from a plurality of metal framing members including studs, joists, trusses, and other metal posts and beams formed from sheet metal and frequently fabricated to have the same general cross-sectional dimensions (profiles) as standard wood members used for similar purposes. Metal framing members are typically constructed by rolling-forming 12 to 24 gauge galvanized sheet steel. Although many cross-sectional shapes are available, the primary shapes (profiles) used in building construction are C-shaped studs and U-shaped tracks.

[0004] In the building construction trade, a head-of-wall joint (also sometimes referred to as a top-of-wall joint) refers to the linear junction or interface existing between a top section of a framing/wallboard wall assembly and the ceiling. Head-of-wall joints often present a serious challenge in terms of reducing or pre-venting the spread of smoke and fire during a building fire. In this regard, and in common practice, a wall to ceiling connection of many newly constructed buildings consists essentially of an inverted U-shaped elongated track configured to receive steel studs between the sidewalls or "legs" of the shaped channel (track). Wallboard is generally attached to at least one side of the studs. The studs and wallboard are in many instances spaced apart from the ceiling a short gap distance in order to allow for ceiling deflections caused by seismic activity or moving overhead loads. Track and stud assemblies that allow for ceiling deflections are commonly referred to as dynamic head-of-wall systems. Exemplary metal stud wall assemblies may be found in U.S. Pat. Nos. 4,854,096 and 4,805,364 both to Smolik, and U.S. Pat. No. 5,127,203 to Paquette. Exemplary dynamic head-of-wall systems having steel stud wall assemblies may be found in U.S. Pat. No. 5,127,760 to Brady, and U.S. Pat. No. 6,748,705 to Orszulak et al.

[0005] In order to contain the spread of smoke and fire, a fire resistant material such as, for example, mineral wool is often times stuffed into the gaps between the ceiling and wallboard (see, e.g., U.S. Pat. No. 5,913,788 to Herren). For example, mineral wool is often stuffed between a steel header track (e.g., an elongated U-shaped channel) and a corrugated steel roof deck (used in many types of steel and concrete building constructions); a fire resistant and generally elastomer spray coating is then applied onto the exposed mineral wool to thereby form a fire resistant joint seal (see, e.g., U.S. Pat. No. 7,240,905 to Stahl). In certain situations where the ceiling to wallboard gap is relatively small, a fire resistant and/or elastomeric caulking is commonly applied so as to fill wall-to-ceiling gaps. In still another approach and as disclosed in U.S. Pat. Nos. 5,471,805 and 5,755,066 both to Becker, a slidable noncombustible secondary wall member is fastened to an especially configured steel header track and immediately adjacent to the wallboard. In this configuration, the secondary wall member provides a fire barrier that is able to accommodate ceiling deflections.

[0006] A preferred approach to containing the spread of smoke and fire, however, is to simply use fire rated track members having a factory applied intumescent strip(s) positioned lengthwise along at least one track's outer sidewall surfaces (see, e.g., U.S. Pat. Nos. 7,681,365 and 7,814,718, both to Klein). Such state-of-the-art fire rated track members are presently being sold throughout the United States under the tradename "BlazeFrame."

[0007] The use of Resilient Channel (RC) in acoustical partition building construction has since the 1960’s been a popular and cost-effective method to increase acoustical isolation. Resilient Channel use in wall assemblies effectively dampens sound waves (by dissipating energy and reducing sound transmission) by suspending gypsum wallboard 7/8 to 1/2 inch (give or take) from the wall assemblies’ wall studs or joists. Resilient Channel members, like many other metal framing members used in building construction, are generally manufactured from 20- and 25-gauge sheet steel, and is typically available with single or double legs.

[0008] In certain preferred practices and as shown in FIGS. 1 and 2 (prior art), Resilient Channel members 10 are used to hold large sections of wallboard 12 suspended and isolated from the wall studs 14 as well as the adjoining wall/ceiling 16. In order to provide a “backing” surface along the top and bottom (of newly constructed wall assemblies utilizing Resilient Channel members 10 attached lengthwise to the wall assemblies’ wall studs 14), a “rippled” piece of wallboard 18 is often attached to the outer surface of the header/bottom track sidewall 20 or “leg” portion of the track 22 (in a fashion somewhat similar to that of Becker, but without Becker’s specialty header track). In these preferred practices, an approximate ¼ to ½ inch gap is maintained all around the newly installed wallboard perimeter such that the wallboard 12 does not contact the adjoining walls or ceiling 16. The gaps around the perimeter are then caulked with an acoustical caulk material 24 (as best shown in prior art FIG. 2).

[0009] The use ofrippled pieces of wallboard at the top and bottom of a newly constructed wall assemblies utilizing outwardly extending Resilient Channel members has a number of drawbacks, including, for example: (1) on-site wallboard for fire rated walls is typically ½ inch thick and the gap distance created by most Resilient Channel members is only ½ inch, thereby requiring the installer to have a separate thickness of wallboard (½ inch thick) to create rips from; (2) if ½ inch wallboard is used instead, the outwardly protruding framing fastener heads tend to create a bulge along the top and bottom of the wall; and (3) wallboard rips do not expand and
seal during fire events, but rather shrink and crack so as to reduce fire protection for fire rated joints.

[0010] In view of the foregoing, there is still a need in the art for new and improved wall assembly products and related track members that allow for enhanced acoustical partitioning as well as smoke and fire containment. The present invention fulfills these needs and provides for further related advantages.

SUMMARY OF THE INVENTION

[0011] In brief, the present invention is directed to the various wall assemblies as disclosed and described herein

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The drawings are intended to be illustrative and symbolic representations of certain exemplary embodiments of the present invention and as such they are not necessarily drawn to scale. In addition, it is to be expressly understood that the relative dimensions and distances depicted in the drawings (and described in the “Detailed Description of the Invention” section) are exemplary and may be varied in numerous ways. Finally, like reference numerals have been used to designate like features throughout the several views of the drawings

[0013] FIG. 1 is a perspective view of a prior art wall assembly having a plurality of Resilient Channel members attached lengthwise to the wall assemblies’ wall studs, and “rippled” pieces of wallboard attached along the top and bottom portions of the wall (wherein the rapped pieces of wallboard function as “backing” surfaces for subsequent installation of the wallboard)

[0014] FIG. 2 is an end view of the top portion of the prior art wall assembly illustrated in FIG. 1

[0015] FIG. 3 is a perspective view of a track member in accordance with an embodiment of the present invention wherein the track member includes an inwardly directed return flange

[0016] FIG. 4 is a perspective view of a track member in accordance with an embodiment of the present invention wherein the track member includes an inwardly directed return flange, and wherein the track member further includes an intumescent flat strip material positioned lengthwise along the track’s outer sidewall surfaces, and wherein the track member still further includes a plurality of slots positioned vertically along the track’s sidewall opposite from the sidewall having the return flange

[0017] FIG. 5 is an end or “profile” view of the track member illustrated in FIG. 3

[0018] FIG. 6 is an end or “profile” view of a further embodiment of the track member of the present invention wherein an inwardly directed return flange further includes a downwardly extending lip.

[0019] FIG. 7 is an end or “profile” view of a further embodiment of the track member of the present invention wherein an inwardly directed return flange further includes an upwardly extending lip.

[0020] FIG. 8 is an end or “profile” view of the track member illustrated in FIG. 4.

[0021] FIG. 9 is an end or “profile” view of a further embodiment of the track member of the present invention wherein an inwardly directed return flange further includes a downwardly extending lip, and wherein the track member further includes an intumescent flat strip material positioned lengthwise along the track’s outer sidewall surfaces.

[0022] FIG. 10 is an end or “profile” view of a further embodiment of the track member of the present invention wherein an inwardly directed return flange further includes an upwardly extending lip, and wherein the track member further includes an intumescent flat strip material positioned lengthwise along the track’s outer sidewall surfaces.

[0023] FIG. 11 is an end view of a top portion of a wall assembly having a plurality of Resilient Channel members attached lengthwise to the wall assemblies’ wall studs, and that includes a header track member in accordance with an embodiment of the present invention.

[0024] FIG. 12 is an end view of a bottom portion of a wall assembly having a plurality of Resilient Channel members attached lengthwise to the wall assemblies’ wall studs, and that includes a bottom track member in accordance with an embodiment of the present invention.

[0025] FIG. 13 is a perspective view of the wall assembly illustrated, in part, in FIG. 11 and FIG. 12.

[0026] FIG. 14 is a graph plotting sound transmission losses associated with certain test results of an exemplary wall assembly in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0027] Referring now to the drawings wherein like reference numerals designate identical or corresponding elements, and more particularly to FIGS. 3-13, the present invention in some embodiments is directed to wall assemblies built and configured for acoustical partitioning, as well as in other embodiments to wall assemblies built and configured for acoustical partitioning and also for containment of smoke and fire (that may occur during a building fire).

[0028] For purposes of illustration and not restriction, the following Example demonstrates various aspects and utility of the present invention.

Example 1

[0029] A mock-up of a sound dampening and fire retardant wall assembly in accordance with an embodiment of the present invention was constructed and tested in accordance with test procedure ASI/M E 90-04, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions. More specifically, the test specimen was a wall assembly constructed from metal studs, resilient (RC) channel, and type X gypsum wallboard. The studs were 3% inch (92 mm) 25-gauge metal MarinoWare Viper studs and were spaced horizontally at 24 inches (607 mm) O.C. A graph plotting sound transmission losses associated with certain test results of an exemplary wall assembly in accordance with the present invention is provided as FIG. 14.

[0030] While the present invention has been described in the context of the embodiments illustrated and described herein, the invention may be embodied in other specific ways or in other specific forms without departing from its spirit or essential characteristics. Therefore, the described embodiments are to be considered in all respects as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description, and all changes that come within the meaning and range of equivalency of the claims are to be embraced within their scope.
What is claimed is:

1. A metal profile member cooperative with walls and partitions of a building including the use of resilient channel for improved sound ratings in both rated and non-rated wall assemblies in addition as a fire stop for protection of head or bottom of wall joints between gypsum wall sheathing and overhead or floor structures as well as sound dampening at said joints said invention comprising:

A t-shaped member having a web and two legs perpendicular to the web with one of said legs having a minimum of one return flange extending inward toward the opposing leg, the distance between the opposing legs is such that it can accommodate the width of a wall framing stud and resilient channel attached to said stud with said return flange being of a distance similar to distance created by the resilient channel formed in a fashion to provide lateral support of the stud material.

An embodiment of said profile having an intumescent material affixed to a portion of the leg which will be proximate to the overhead or floor structure dependent on the installation and use of the profile.

2. The profile member in accordance with claim 1 adapted to be positioned at the top of a framed wall.

3. The profile member in accordance with claim 1 adapted to be positioned at the bottom of a framed wall.

4. An embodiment of the profile member in accordance with claim 1 adapted so that the second flange may extend from said first flange in a perpendicular fashion.

5. An embodiment of the profile member in accordance with claim 1 having a minimum of one slot in the leg opposite the leg with said flange allowing for attachment of a fastener through the slot into the wall framing providing positive attachment while enabling the accommodation of cyclical movement of the structure.

6. A wall assembly utilizing the profile member in accordance with claim 1 at the head of the wall having a plurality of studs positioned between said leg and said return flange of opposing leg, a resilient type channel attached to the studs, wall sheathing attached to the studs on one side and the resilient channel on the opposing side of the assembly with said wall sheathing in contact with said intumescent materials.

7. A wall assembly utilizing the profile member in accordance with claim 1 at the bottom of the wall having a plurality of studs positioned between said leg and said return flange of opposing leg, a resilient type channel attached to the studs, wall sheathing attached to the studs on one side and the resilient channel on the opposing side of the assembly with said wall sheathing in contact with said intumescent materials.

8. A wall assembly, comprising:

a. a bottom track;
   a header track confronting and vertically spaced apart from the bottom track;
   a plurality of spaced apart studs vertically positioned between the bottom and header track; and
   a plurality of horizontally positioned resilient channel (RC) members attached to the studs.

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