PATENT SPECIFICATION

Application Date: July 20, 1935. No. 20706/35. **460,035**

Complete Specification Left: June 29, 1936.

Complete Specification Accepted: Jan. 20, 1937.

PROVISIONAL SPECIFICATION

Improvements in and relating to the Construction of Lath and Slab and like Ceilings, Walls, Roofs, Partitions and like Structures

We, GILBERT HOLBOROW NORRIS, a British Subject, and THE TEN TEST FIBRE BOARD COMPANY LIMITED, a Company organised under the laws of Great Britain and Northern Ireland, both of Astor House, Aldwych, London, W.C.2, do hereby declare the nature of this invention to be as follows:—

The invention relates to the construction of lath and slab and the like ceilings, walls, roofs, partitions and like structures, and more particularly to the attachment of the sheets or slabs to the metal or other frame of the structure.

The sheets or slabs forming the lining or casing of the structure cover a wide range and include by way of example, fibre board, corrugated iron sheets and fire-resisting sheets or slabs.

In this specification the word "lath" is intended to include the members to which the slabs or sheets are directly attached, and the term "purlin" to include the rafters, joists or equivalent members forming part of the frame structure and to which the laths are in turn attached.

In the present invention a lath of special form is used, but the purlins may be angle irons, tee irons, channel irons, steel tubing or the like.

In metal frame structures for example, the purlins to which the sheets or slabs forming the ceiling, wall, roof or partition are attached, are frequently arranged irregularly, being neither parallel to one another nor equidistantly spaced, and it is therefore very difficult to obtain a regular arrangement of supporting laths and consequent uniform support for the sheets or slabs forming the lining or casing.

The main object of the present invention is to remove this disadvantage by providing a simple attachment between the sheets or slabs and their supporting member or members such as will allow the supports a high degree of adjustability without necessitating the drilling of holes in the structural frame. The attachment also has the added advantage that it can be made substantially fire-proof.

The method of attachment of the laths to the purlins according to the invention consists in providing at their point of attachment one member adjustable longitudinally on the purlin and a second member adjustable longitudinally on the lath, the two members being connected together by a third member constituting a pivot which also acts as a clamping member between the two first members, the lath being thus frictionally retained on the purlin at any desired angle.

The invention also consists in means for giving practical effect to the method set out in the preceding paragraph.

According to the invention, while the purlins may take the form of angle irons, tee irons, channel irons or the like, the supporting laths are formed of relatively thin metal of channel section having their free edges each formed with a flange which is preferably in-turned, the in-turned edges being adapted to rest and to be frictionally retained upon one web of the angle iron or other member forming the purlin so that the outer face of the base of the lath acts as a supporting face for the sheets or slabs forming the ceiling, partition or the like.

Where an angle iron purlin is used, its associated slidable member may conveniently take the form of an **L**-shaped plate approximately equal in width to the lath and having one end face adapted to run parallel with the in-turned edges of the lath and the other being bent outward and returned to define a hook adapted to partially embrace the flange of the angle iron. This slidable member is connected to, and in association with, a plate slidable within the lath and substantially equal in width thereto, being connected to the **L**-shaped member by means of a screwed stud or bolt and nut. By tightening the nut on the stud or bolt, the lower plate is firmly clamped to the under face of the in-turned edges of the lath, the upper face of which is held firmly against the under face of the purlin. It will be seen that when the pivot pin is loose, the

[*Price* 1/-]

lath can be adjusted to any position upon, or at any angle to, the general direction of the purlin.

The pivot pin may be screwed into a nut positioned on the under-side of the sliding plate member within the channel, or the sliding plate may have an equivalent member integrally welded thereto, which member would, with the plate, be suitably bored and screwed.

Alternatively, the lath may have flanges out-turned, in which case the slidable plate within the lath would be replaced by a slidable plate bent over the out-turned flanges.

The sheets, slabs or linings forming the ceiling or wall faces are adapted to be secured to the laths so attached, in known manner, such as by piercing holes a suitable distance apart in the base of the lath, and held by special screws which grip the steel, or alternatively, bolts or other form of fixing may be used. In some cases, wood screws or nails may be used as a means of attachment of the sheet or slab to the lath, holes being punched at suitable intervals in the lath for this purpose and the inside of the lath plugged with wood or other material, affording a holding for the screw or nail.

The plates slidable within the lath may be curved transversely or dished to assist in the gripping action on the in-turned edges of the flanges.

By use of attachments made according to this invention, the laths may be arranged in any desired manner, as may be necessitated by the shape and size of the sheets or slabs, the attaching members being slidable on both the purlins and the laths, and angularly adjustable with respect to the latter, thereby rendering the positions of the laths independent of the positions of the purlins.

We wish it to be understood that the precise form of the L-shaped member may be varied to suit other forms of purlin and that various other minor modifications may be made in the details of construction hereinbefore set forth within the scope of our invention.

Dated this 20th day of July, 1935.

MEWBURN, ELLIS & CO.,
70 & 72, Chancery Lane, London, W.C.2.
Chartered Patent Agents

COMPLETE SPECIFICATION

Improvements in and relating to the Construction of Lath and Slab and like Ceilings, Walls, Roofs, Partitions and like Structures

We, GILBERT HOLBOROW NORRIS, a British Subject, and THE TEN TEST FIBRE BOARD COMPANY LIMITED, a Company organised under the laws of Great Britain and Northern Ireland, both of Astor House, Aldwych, London, W.C.2, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The invention relates to the construction of lath ceilings, walls, roofs, partitions and like structures formed of laths and slabs or sheets, and more particularly to the attachment to the metal or other frame of the structure of the laths for supporting the covering or lining sheets or slabs.

The sheets or slabs forming the lining or casing of the structure cover a wide range and include by way of example, fibre board, corrugated iron sheets and fire-resisting sheets or slabs.

In this specification the word "lath" is intended to include the members to which the slabs or sheets are directly attached, and the term "purlin" to include the studs, rafters, joists or equivalent members forming part of the frame structure and to which the laths are in turn attached.

In the present invention laths and purlins of known form are used. The purlins may be angle irons, tee irons, channel irons, steel tubing or the like.

In metal frame structures for example, the purlins to which the sheets or slabs forming the ceiling, wall, roof or partition are indirectly attached, are frequently arranged irregularly, being neither parallel to one another nor equidistantly spaced, and it is therefore very difficult to obtain a regular arrangement of supporting laths and consequent uniform support for the sheets or slabs forming the lining or casing.

The main object of the present invention is to remove this disadvantage by providing a simple attachment to the metal or other frame of the structure of the laths supporting the covering or lining sheets or slabs such as will allow the laths a high degree of adjustability without necessitating the drilling of holes in the structural frame. The attachment also

has the added advantage that it can be made substantially fire-proof.

According to the invention the method of attaching the slab or sheet supporting laths of ceilings, walls, partitions, roofs and like structures to joists, studs, rafters, purlins or like frame members consists in providing at the point of attachment one member adjustable longitudinally of the purlin or equivalent member and another member adjustable longitudinally of the lath, the two members being firmly and rigidly connected by clamping means which is adjustable to permit a pivotal movement thereof, whereby the lath is retained on the purlin or equivalent member at any desired angle thereto.

The invention also consists in a structure comprising laths and purlins connected together according to the method set out in the preceding paragraph, wherein the laths are formed of relatively thin metal of approximately channel section, the free edges of which are provided with flanges adapted to carry the members by means of which the said laths are adjustably and rigidly secured to the purlins.

In order that the invention may be clearly understood and readily carried into effect reference is directed to the accompanying drawings wherein:—

Figure 1 is a perspective view of a lath assembly as applied to and supported by angle iron purlins, the slab covering which would normally be applied to the underside of the laths being omitted.

Figure 2 is a section of a lath and associated parts and slab applied thereto.

Figure 3 is a modified form of slidable member.

Figure 4 is a perspective view of two slidable members which are arranged to connect the abutting ends of a pair of laths to an angle section purlin.

Figure 5 is a section of a device for connecting the slabs to the lathing.

Figure 6 is a section on the line II—II of Fig. 5.

Figure 7 is a perspective view of a slidable lath in association with a tubular purlin.

Figure 8 is a perspective view showing a lath having a wood or like filling.

In carrying the invention into effect the purlins may take the form of angle irons, tee irons, channel irons, tubes or the like. Angle iron purlins 1 are shown in Figures 1 and 2 of the accompanying drawings as one example. The supporting laths 2 are formed of relatively thin metal of channel section having their free edges each formed with a flange 3 which is preferably in-turned, the inturned edges being adapted to contact with, and to be frictionally retained upon, one web of the angle iron 1 forming the purlin so that the outer face of the base 4 of the lath acts as a supporting face for the sheets or slabs 5 forming the ceiling, partition or the like.

Where an angle iron purlin is used, as in Figures 1 and 2 (shown dotted) its associated slidable member may conveniently take the form of an L-shaped plate 6 approximately equal in width to the lath and having one end face 7 adapted to run parallel with the in-turned edges of the lath and the other being bent outward and returned to define a hook 8 adapted to partially embrace the flange of the angle iron 1. The slidable member 6 is connected to, and is in association with, a plate 9 slidable within the lath 2 and substantially equal in width thereto, being connected to the L-shaped member 6 by means of a screwed stud or bolt 10 and nut 12. The aperture in plate 9 for the passage of the stud or bolt 10 having a head 11 is preferably enlarged or in the form of a slot. By tightening the nut 12 on the stud or bolt 10, the lower plate 9 is firmly and rigidly clamped to the under face of the in-turned edges of the lath 2, the upper face of which is held firmly against the under face of the purlin 1. It will be seen that when the bolt 10 is loose, the lath can be adjusted to any position upon, or at any angle to, the general direction of the purlin.

The bolt 10 is screwed into the nut 12 positioned on the underside of the sliding plate member 9 within the channel, or the sliding plate 9 may have a stud integrally welded thereto, and adapted to project through the part 7 and to be suitably screwed and fitted with a nut. In the latter case the base 7 of the member 6 would be formed with a large hole or slot for the bolt 10 to allow for adjustment between the parts.

Alternatively, the lath may have its flanges out-turned, in which case the slidable plate within the lath would be replaced by a slidable plate bent over these out-turned flanges.

Figure 3 illustrates a modified form of the slidable member wherein provision is made for supporting the lath structure upon a rectangular shaped purlin 16, the extremity of the L-shaped plate having a right-angled extension 13 which rests upon the upper surface of the purlin.

The laths are connected together at their points of intersection, (Figures 1 and 2) by means of a pair of clamping plates 14 and 15 one of which, 15, is disposed within a lath 2 so as to bear upon the under surfaces of the flanges 3 thereof

and is pivotally connected to the other or cover plate 14 by means of a bolt and nut 17. This latter plate 14 extends over and beyond the side of the lath 2 so as to rest upon the upper side of the flanges 3 thereof and of the two laths 2a, being connected by bolts 18 to plates 9 disposed interiorly of the laths 2a as previously described.

In Figure 4 the abutting ends of a pair of laths 2 are disposed beneath a purlin 1 of angle cross section the said laths being connected to the purlin by means of a pair of slidable members 6 which are channelled longitudinally to strengthen the construction. One slidable member 6 is formed with a step portion 6a which engages with the horizontal flange of the angle iron purlin whilst the other slidable member is formed with a hook portion 8 as hereinbefore described.

The sheets, slabs or linings forming the ceiling or wall faces are adapted to be secured to the laths so attached, in known manner, such as by piercing holes a suitable distance apart in the base of the lath, to take screws of known kind which grip the steel. Alternatively, bolts or other form of fixing may be used. In some cases, wood screws or nails may be used as a means of attachment of the sheet or slab to the lath, holes being punched at suitable intervals in the lath for this purpose and the inside of the lath plugged with wood or other material, affording a holding for the screw or nail.

Figures 5 and 6 illustrate a device for connecting slabs to the lath structure. Two substantially abutting slabs are shown at 5 and the lath at 21. The slabs are secured to the lath by means of a bolt 22 having at its lower end a circular or other plate 23 which is preferably secured to the bolt by welding. The confronting edges of the slabs are suitably recessed to take the bolt. The lower wall of the lath is formed with a slot or hole of relatively large diameter at 25 so as to provide a degree of adjustment between the slabs 5 and the lath 21. The top of the lath is fitted with a washer plate 26 through which the bolt 22 is passed, the whole being secured together by means of the nut 27.

Figure 7 shows an arrangement wherein the purlin takes the form of a tubular member 30 to which the lath 2 is secured by means of the sliding member 31. This member 31 is so formed as to embrace the upper part of the tubular member 30 slightly beyond its vertical centre to prevent the tubular member being moved sideways out of engagement with the lath when the parts are secured together. The method of securing the parts together by means of bolt 11 is similar to that employed in the arrangement shown in Figures 1 to 4.

Figure 8 shows a modified form of lath, the modification consisting of a core or filler 32 of wood or like material. This filler is maintained firmly in position by means of a plate 33 which is secured to the side walls of the lath by welding or other means. The plate 33 may extend the full length of the lath or may consist of a plurality of relatively short pieces. The wood filler provides a solid substance into which screws or the like used for securing the slabs to the lath will bite.

By use of attachments made according to this invention, the laths may be arranged in any desired manner, as may be necessitated by the shape and size of the sheets or slabs, the attaching members being slidable on both the purlins and the laths, and angularly adjustable with respect to the latter, thereby rendering the positions of the laths independent of the positions of the purlins.

We wish it to be understood that the precise form of the L-shaped member may be varied to suit other forms of purlin as for example as shown in Fig. 3 in which a rectangular purlin would be used, or as in Fig. 7 where a tubular purlin is used, and that various other minor modifications may be made in the details of construction hereinbefore set forth.

It has previously been proposed in ceiling and wall constructions to provide slab or sheet supporting metal laths or runners and metal studding or framework connected by swivel clips formed of two parts one of which is adapted to be bent when in position to slidably embrace the lath, and the other to be adjustable longitudinally along the studding or framework, the two parts of the said clip being connected by a pivot pin without clamping, and we make no claim to such an arrangement, but:—

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A method of attaching the slab or sheet supporting laths of ceilings, walls, partitions, roofs and like structures to joists, studs, rafters, purlins or like frame members, which consists in providing at the point of attachment one member adjustable longitudinally of the purlin or equivalent member and another member adjustable longitudinally of the lath, the two members being firmly and rigidly connected by clamping means which is adjustable to permit a pivotal movement thereof, whereby the lath is retained on

and is pivotally connected to the other or cover plate 14 by means of a bolt and nut 17. This latter plate 14 extends over and beyond the side of the lath 2 so as to rest upon the upper side of the flanges 3 thereof and of the two laths 2a, being connected by bolts 18 to plates 9 disposed interiorly of the laths 2a as previously described.

In Figure 4 the abutting ends of a pair of laths 2 are disposed beneath a purlin 1 of angle cross section the said laths being connected to the purlin by means of a pair of slidable members 6 which are channelled longitudinally to strengthen the construction. One slidable member 6 is formed with a step portion 6a which engages with the horizontal flange of the angle iron purlin whilst the other slidable member is formed with a hook portion 8 as hereinbefore described.

The sheets, slabs or linings forming the ceiling or wall faces are adapted to be secured to the laths so attached, in known manner, such as by piercing holes a suitable distance apart in the base of the lath, to take screws of known kind which grip the steel. Alternatively, bolts or other form of fixing may be used. In some cases, wood screws or nails may be used as a means of attachment of the sheet or slab to the lath, holes being punched at suitable intervals in the lath for this purpose and the inside of the lath plugged with wood or other material, affording a holding for the screw or nail.

Figures 5 and 6 illustrate a device for connecting slabs to the lath structure. Two substantially abutting slabs are shown at 5 and the lath at 21. The slabs are secured to the lath by means of a bolt 22 having at its lower end a circular or other plate 23 which is preferably secured to the bolt by welding. The confronting edges of the slabs are suitably recessed to take the bolt. The lower wall of the lath is formed with a slot or hole of relatively large diameter at 25 so as to provide a degree of adjustment between the slabs 5 and the lath 21. The top of the lath is fitted with a washer plate 26 through which the bolt 22 is passed, the whole being secured together by means of the nut 27.

Figure 7 shows an arrangement wherein the purlin takes the form of a tubular member 30 to which the lath 2 is secured by means of the sliding member 31. This member 31 is so formed as to embrace the upper part of the tubular member 30 slightly beyond its vertical centre to prevent the tubular member being moved sideways out of engagement with the lath when the parts are secured together. The method of securing the parts together by means of bolt 11 is similar to that employed in the arrangement shown in Figures 1 to 4.

Figure 8 shows a modified form of lath, the modification consisting of a core or filler 32 of wood or like material. This filler is maintained firmly in position by means of a plate 33 which is secured to the side walls of the lath by welding or other means. The plate 33 may extend the full length of the lath or may consist of a plurality of relatively short pieces. The wood filler provides a solid substance into which screws or the like used for securing the slabs to the lath will bite.

By use of attachments made according to this invention, the laths may be arranged in any desired manner, as may be necessitated by the shape and size of the sheets or slabs, the attaching members being slidable on both the purlins and the laths, and angularly adjustable with respect to the latter, thereby rendering the positions of the laths independent of the positions of the purlins.

We wish it to be understood that the precise form of the L-shaped member may be varied to suit other forms of purlin as for example as shown in Fig. 3 in which a rectangular purlin would be used, or as in Fig. 7 where a tubular purlin is used, and that various other minor modifications may be made in the details of construction hereinbefore set forth.

It has previously been proposed in ceiling and wall constructions to provide slab or sheet supporting metal laths or runners and metal studding or framework connected by swivel clips formed of two parts one of which is adapted to be bent when in position to slidably embrace the lath, and the other to be adjustable longitudinally along the studding or framework, the two parts of the said clip being connected by a pivot pin without clamping, and we make no claim to such an arrangement, but:—

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A method of attaching the slab or sheet supporting laths of ceilings, walls, partitions, roofs and like structures to joists, studs, rafters, purlins or like frame members, which consists in providing at the point of attachment one member adjustable longitudinally of the purlin or equivalent member and another member adjustable longitudinally of the lath, the two members being firmly and rigidly connected by clamping means which is adjustable to permit a pivotal movement thereof, whereby the lath is retained on

the purlin or equivalent member at any desired angle thereto.

2. A structure composed of laths and purlins or like frame members connected together by the method according to claim 1, wherein the laths are formed of relatively thin metal of channel section.

3. A structure as in claim 2, wherein the laths are of sheet metal and of channel cross section having the free edges provided with flanges for attachment of the means for adjustably connecting said laths to the purlins or like members.

4. A structure as claimed in claims 2 and 3, wherein the laths are fitted with a wood or like core.

5. A structure as claimed in claim 3, wherein means for connecting the laths to the purlins or like members comprise a pair of plates pivotally connected together and adapted to be clamped together through the medium of the flange portions of the lath.

6. A structure as claimed in claim 5, wherein one of the plates has an extension in the form of a hook for slidably engaging the purlin or like member.

7. A structure as claimed in claim 5 or 6, wherein the plates are channelled for the purpose specified.

8. The improved method of and means for connecting laths to purlins or like members substantially as herein described with reference to the accompanying drawings.

9. The improved structure of laths and purlins or like members constructed, arranged and adapted to operate substantially as herein described with reference to the accompanying drawings.

Dated this 29th. day of June, 1936.

MEWBURN, ELLIS & CO.,
70 & 72, Chancery Lane, London, W.C.2.
Chartered Patent Agents.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1937.