

May 16, 1933.

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1,909,559

FASTENING FOR OVERLAPPING ROOFING PLATES

Filed March 25, 1931

2 Sheets-Sheet 1

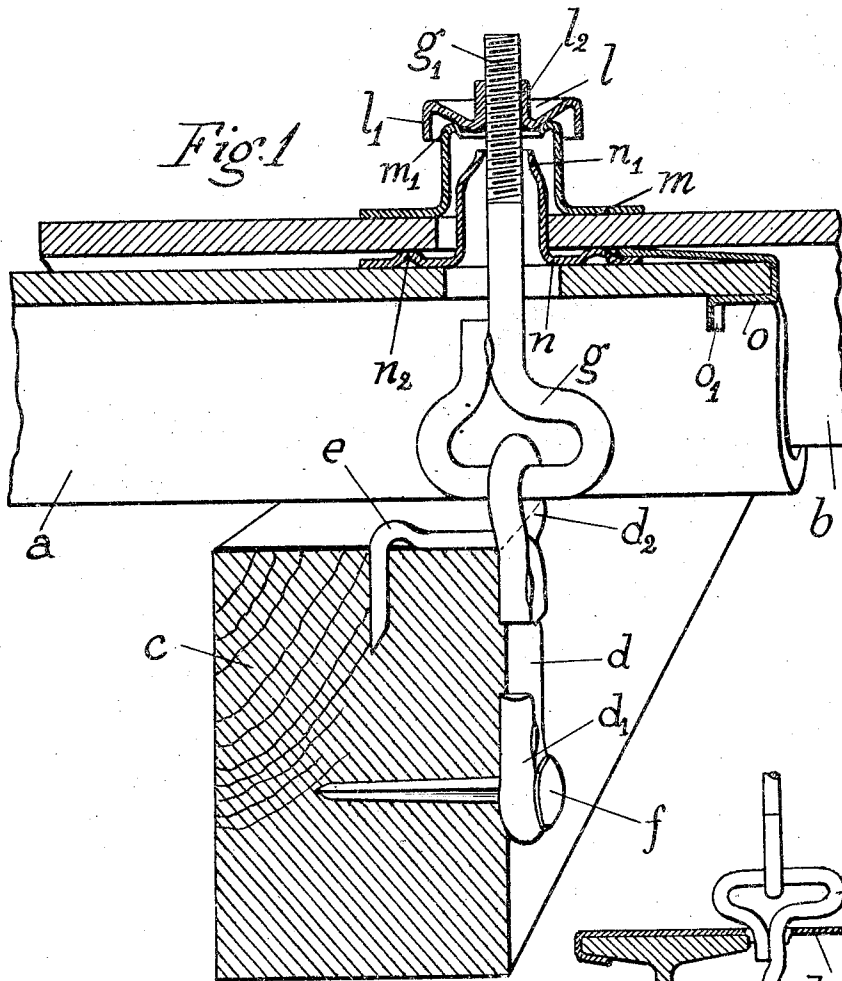
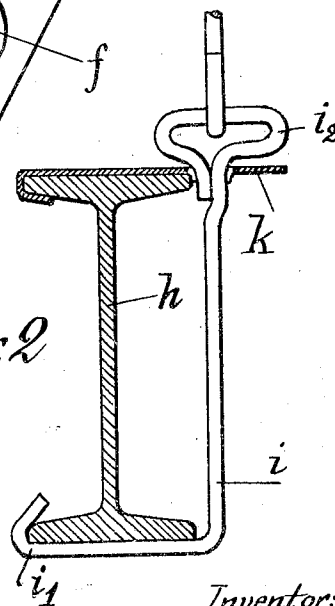


Fig. 2



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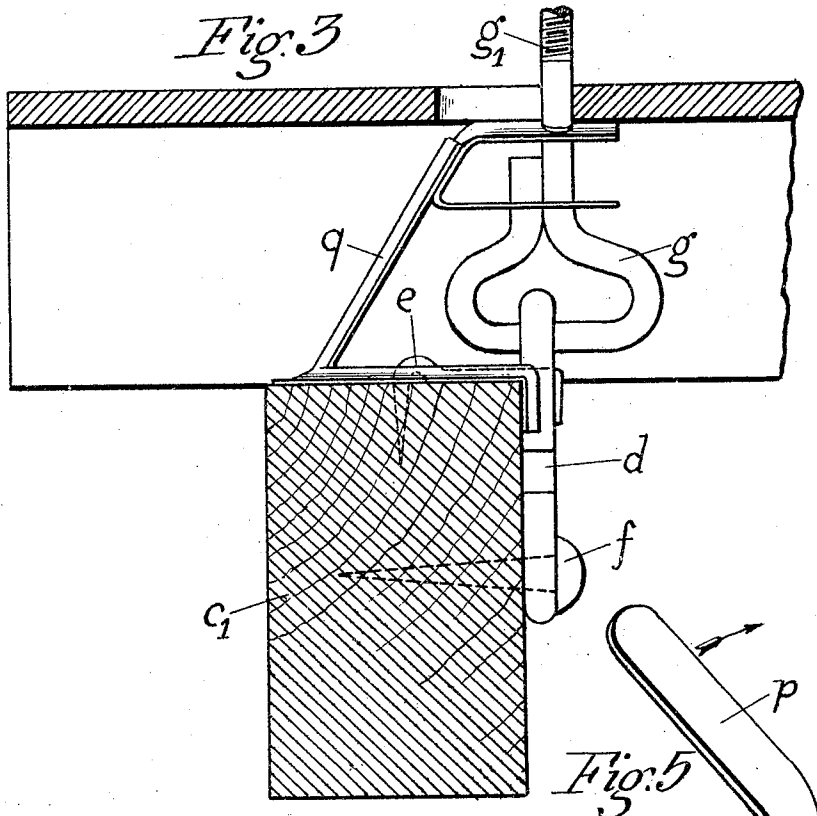
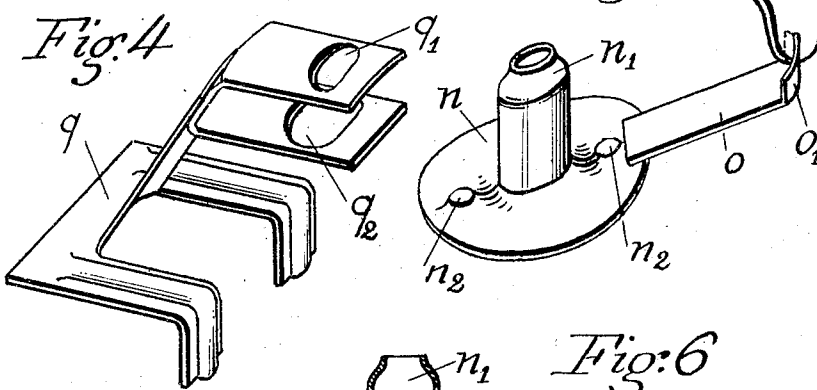
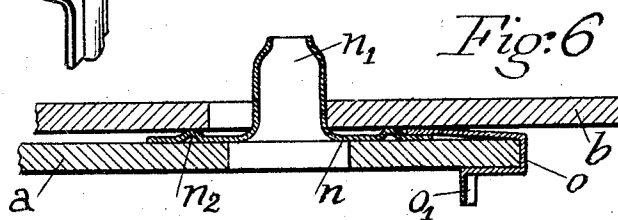
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UNITED STATES PATENT OFFICE

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FASTENING FOR OVERLAPPING ROOFING PLATES

Application filed March 25, 1931, Serial No. 525,229, and in France April 1, 1930.

The Letters Patent No. 1,638,671, of Aug. 9, 1927, describes a roofing fastening for undulated roofing plates of asbestos-cement, known in the trade under the name of Eternit, glass, metal or the like. These fastenings comprise a fastening rod which projects upwardly through a perforation in at least one of the overlapping plates and which has its lower end rigidly engaged with the adjacent member of the framework, a rigid strengthening member through which said rod extends having its entire upper face fitting flush against the inner surface of the perforated plate; a malleable metal washer mounted on the projecting portion of the rod and disposed against the external surface of said perforated plate; and a clamping member threaded on said projecting rod portion and anchored in the external surface of said washer. These special fastenings enable a fixing of the roofing plates independently of their support, thus being protected against damages resulting from deformations of the support or of the roof construction. Furthermore, the fastenings are even then watertight when the fixing screw becomes unscrewed.

The object of the present invention concerns essential improvements of these roofing fastenings.

The drawings show some embodiments of the invention, by way of example.

Fig. 1 shows the fastenings for roofing plates destined to be fixed on wooden purlins or supports;

Fig. 2 shows a modified form destined to be fixed at double T-girders;

Fig. 3 shows the fastenings as they are used to be fixed at the lowest purlin or template;

Fig. 4 is a perspective view of a detail, i. e. a support used for the fastenings shown in Fig. 3;

Fig. 5 shows also a detail, i. e. a tightening disc in perspective view together with the implement for its fitting up or adjusting;

Fig. 6 is a vertical cross section through said tightening disc.

The fastenings of undulated roofing plates

a and *b*, destined to be fixed at a wooden purlin *c*, consist of a metallic bolt *d*, each extremity having an eye *d*₁ and *d*₂, to which a bent hook-shaped pin is fixed by welding. The latter is driven into the purlin *c*; a nail *f* passing through the lower eye *d*₁ secures the position of the double eye bolt *d* to the wooden purlin *c*. The upper eye *d*₂ is hingedly linked to an eye *g* at one extremity of a top bolt *g*—*g*₁, its other end *g*₁ being screw-threaded. Through the stretched oval shaped eye *g*, a greater play than up to now is obtained, from which results a better adjustment of the bolt *g*—*g*₁, for the case in which the purlins or girders are not exactly uniformly spaced. Furthermore, therefrom results the advantage that the roofing plates can be perforated by appropriate machines in the manufactory or workshop according to a gauge, avoiding a preliminary adjustment relative to the laid purlins. From this results an easy, quick and cheap erection and assemblage of the roof. The linked bolts are previously fixed to the roof construction subdivided by an appropriate lining out, for instance to wooden purlins.

Fig. 2 shows how the two bolts *i*—*i*₁—*i*₂ and *g*—*g*₁ hinged together are fixed to a double T-girder *h*. Whilst the lower part of the bolt *i* embraces the lower flange of the girder in the form of a hook, the upper part is kept by a strip of sheet metal *k* having a corresponding aperture for said bolt *i*. After fixing of its eye in the manner shown in Fig. 2, the strip of sheet metal *k* is bent round the upper flange of the girder *h*, thus enabling the fixing of the linked bolt preliminary to the quick continuous mounting. Here the eye of the lower bolt *i* has a stretched oval shape for compensating an irregular distance between the purlins for exactly machine-perforated roofing plates.

A washer *l* with screw-threaded bush cooperating with the screw-threaded end *g*₁ (Fig. 1) of the eye bolt *g*—*g*₁, rests against the bush-shaped part *m*₁ of the bearing disc *m*, the latter being round-, oval- or polygonal shaped and adapted to the form of the

roofing plate, whilst the bush has at its upper end an upward flange forming an annular concave seat, so that the cone-shaped washer l , cooperating with this seat, 5 secures also during deformations of the girder or of the purlin a water-tight joint. An overlapping depending collar l_1 of the washer guides rain water on the bearing disc m projecting on all sides over said 10 washer, and from this disc m on the roofing plate b .

As the screw-threaded bush is higher than the upper outer edge of the cone-shaped part, the water accumulating on the latter 15 will never reach either the upper edge of the bush or the screw-threaded part g_1 of the bolt $g-g_1$, so that said water will not penetrate between bush and bolt.

If occasional moisture penetrates, it is intercepted by the cone-shaped head portion of a tube n_1 carried by the tightening disc n lying between both roofing plates and all passed drop-water will be led away by 25 said disc n . The bolt $g-g_1$ passes through said tube n_1 . Furthermore, the tightening disc n , curved according to the roofing plate has at its back bosses n_2 obtained by pressing (Figs. 1 and 5), serving to space apart 30 the two roofing plates a and b over a small distance and to protect the roofing plate b against the pressure exerted by the screw bolt. The upper part of the tube n_1 of the tightening disc n being cone-shaped, an occasional capillary action between the bush 35 m_1 and the tube n_1 is avoided.

The tightening disc n will be moved laterally during assembling the roofing plates by means of an adjusting implement p , for 40 compensating the irregularities of the distances between the purlins. The tube n_1 of the tightening disc n serves as an adjusting stop for the next roofing plate b .

The strip of sheet metal o soldered to 45 the disc n is caught at its bent up grip o_1 by means of said small implement p , as shown in Fig. 5, and then bent round the border of the roofing plate a , as shown in Figs. 1 and 6, after adjustment of the seat 50 of the tightening disc n . In this manner, the two roofing plates are fixed to one another.

For giving the necessary stiffness to the roofing fixed by means of hingedly connected members clasped to the roof construction, and for preventing the roof from giving 55 way by slipping in the direction of the inclination of the roof, special supports q are mounted on the lowest purlin c_1 or on the upper edge of the external wall (Figs. 3 and 4). This support q has two parallel 60 lateral arms with apertures q_1 and q_2 keeping and maintaining the eye bolt $g-g_1$ in right and determined fixed position with relation to the direction of roof inclina-

tion, but leaving a lateral play or clearance.

I claim:

1. Means for fastening overlapping roofing plates to a supporting framework, comprising a top eye bolt having a screw-threaded end projecting upwardly through superposed perforations in the overlapping 70 plates, a lower eye bolt hinged into the eye of said top eye bolt and which has its lower end engaged with the adjacent member of the framework, a tube-shaped member with flange through which said top bolt extends and means for fixing said flange to the lower of both roofing 75 plates, a bush-shaped member with flange surrounding the upper part of said tube-shaped member, and a screw-threaded washer with depending collar protecting the upper edge of the bush-shaped member against rain water, screwed on the top eye 80 bolt and adapted to press the bush-shaped member down with its flange on the upper of both roofing plates.

2. Means for fastening overlapping roofing plates to a supporting framework, comprising a top eye bolt having a screw-threaded end projecting upwardly through superposed perforations in the overlapping plates and the eye of which has a stretched oval 85 shape, a lower eye bolt hinged into the eye of said top eye bolt and which has its lower end engaged with the adjacent member of the framework, a tube-shaped member with flange through which said top bolt extends and means for fixing said flange to the 90 lower of both roofing plates, a bush-shaped member with flange surrounding the upper part of said tube-shaped member, and a screw-threaded washer with depending collar protecting the upper edge of the bush-shaped member against rain water, screwed 95 on the top eye bolt and adapted to press the bush-shaped member down with its flange on the upper of both roofing plates.

3. Means for fastening overlapping roofing plates to a supporting framework, comprising a top eye bolt having a screw-threaded end projecting upwardly through superposed perforations in the overlapping 100 plates, a lower eye bolt hinged into the eye of said top eye bolt and which has its lower end engaged with the adjacent member of the framework, a tube-shaped member with flange through which said top bolt extends and means for fixing said flange to the lower 105 of both roofing plates, a bush-shaped member with flange surrounding the upper part of said tube-shaped member, and a screw-threaded washer with depending collar protecting the upper edge of the bush-shaped member against rain water, screwed 110 on the top eye bolt and adapted to press the bush-shaped members down with its flange on the upper of both roofing plates, the central part of said washer being reversed cone- 115 120 125 130

shaped, its lower surface cooperating with the upper edge of said tube, a screw-threaded hub in the center of said washer and surmounting the upper outer edge of the cone-shaped part for preventing water from penetrating between the screw-threaded part of the top eye bolt and the screw-threaded hub of the washer.

4. Means for fastening overlapping roofing plates to a supporting framework, comprising a top eye bolt having a screw-threaded end projecting upwardly through superposed perforations in the overlapping plates, a lower eye bolt hinged into the eye of said top eye bolt and which has its lower end engaged with the adjacent member of the framework, a tube-shaped member with a conical upper extremity and a flange, through which said top bolt extends and means for fixing said flange to the lower of both roofing plates, a bush-shaped member with flange surrounding the upper part of said tube-shaped member, and a screw-threaded washer with depending collar protecting the upper edge of the bush-shaped member against rain water, screwed on the top eye bolt and adapted to press the bush-shaped member down with its flange on the upper of both roofing plates, the central part of said washer being reversed cone-shaped, its lower surface engaging a concave annular seat formed at the upper edge of said tube.

5. Means for fastening overlapping roofing plates to a supporting framework, comprising a top eye bolt having a screw-threaded end projecting upwardly through superposed perforations in the overlapping plates, a lower eye bolt hinged into the eye of said top eye bolt and which has its lower end engaged with the adjacent member of the framework, a tube-shaped member with flange through which said top bolt extends, at least two bosses on said flange, a strip of sheet metal fixed to said flange and provided with a bent up grip, said strip adapted to be bent round the edge of the lower roofing plate to adjust the position of the tube relative to said lower roofing plate, a bush-shaped member with flange surrounding the upper part of said tube-shaped member, and a screw-threaded washer with depending collar protecting the upper edge of the bush shaped member against rain water, screwed on the top eye bolt and adapted to press the bush-shaped member down with its flange on the upper of both roofing plates.

6. Means for fastening overlapping roofing plates to a supporting framework, comprising a top eye bolt having a screw-threaded end, a lower eye bolt hinged into the eye of said top eye bolt and which has its lower end engaged with the adjacent member of the framework, means for fix-

ing the upper end of said lower eye bolt to said member of the framework, guide-means supported by said member of the framework for controlling the position of the top bolt with respect to the direction of inclination of the roof, a tube-shaped member with flange through which said top bolt extends and means for fixing said flange to the lower of both roofing plates, a bush-shaped member with flange surrounding the upper part of said tube-shaped member, and a screw-threaded washer with depending collar protecting the upper edge of the bush-shaped member against rain water, screwed on the top eye bolt and adapted to press the bush-shaped member down with its flange on the upper of both roofing plates.

7. Means for fastening overlapping roofing plates to a supporting framework, comprising a top eye bolt having a screw-threaded end projecting upwardly through superposed perforations in the overlapping plates, a lower eye bolt hinged into the eye of said top eye bolt and which has its lower end engaged with the adjacent member of the framework, a tube-shaped member with flange through which said bolt extends and means for fixing said flange to the lower of both roofing plates, a bush-shaped member with flange surrounding the upper part of said tube-shaped member, a screw threaded washer with depending collar protecting the upper edge of the bush-shaped member against rain water, screwed on the top eye bolt and adapted to press the bush-shaped member down with its flange on the upper of both roofing plates, and a guiding element supported by said member of the framework and having at least one claw at the lower part for gripping said framework member, and at least one arm with a slit embracing the top eye bolt, the arrangement being such that the top bolt is steadied in the direction of inclination of the roof, but remains movable in the direction parallel to the ridge-line of the roof for the purpose of adjustment.

In testimony whereof I signed hereunder my name.

MARCEL WAGNER.