Dec. 24, 1940. A. ELMENDORF 2,226,239

SHINGLE ROOF CONSTRUCTION

Filed Dec. 30, 1933 2 Sheets-Sheet 1

Fig. 1.

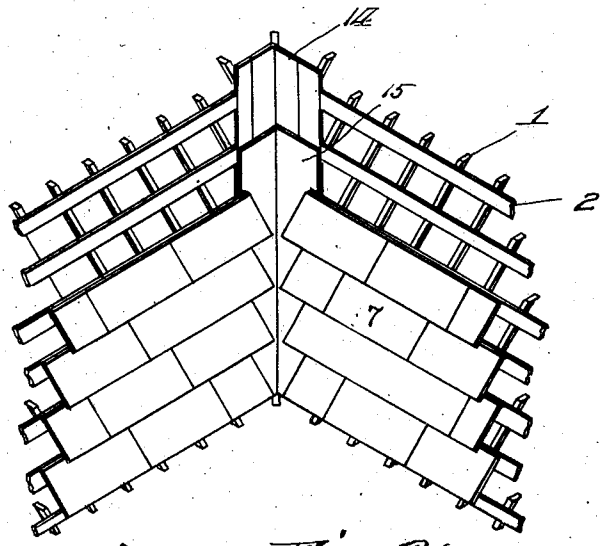
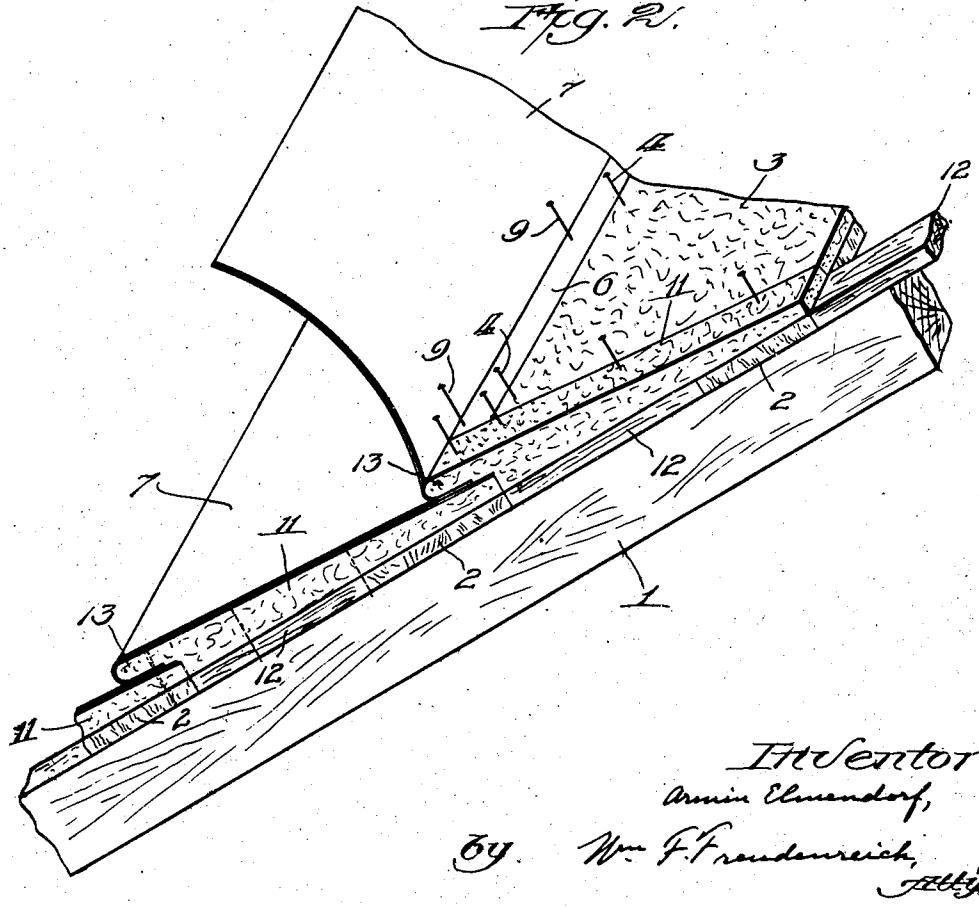


Fig. 2.



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Fig. 3.

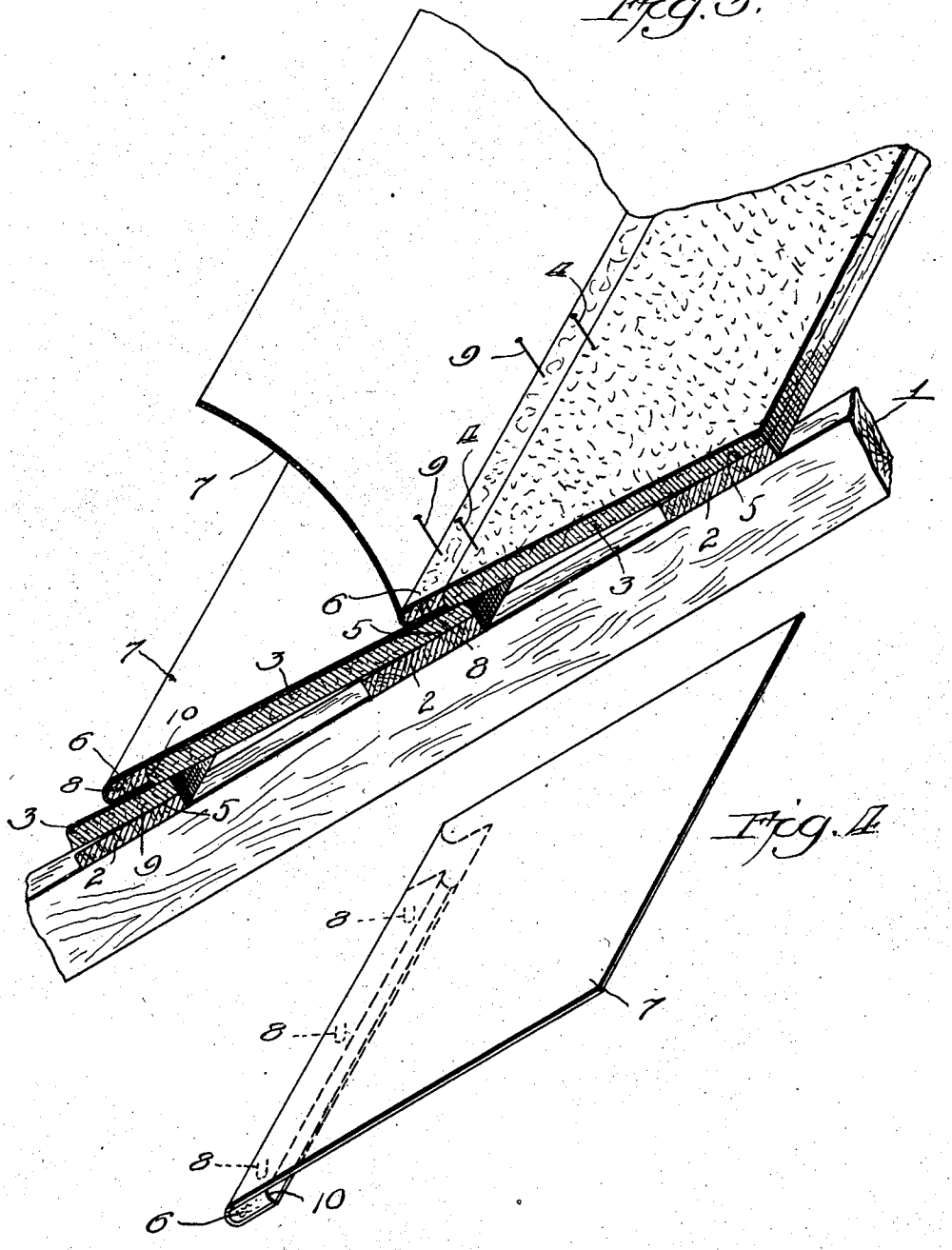


Fig. 4

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SHINGLE ROOF CONSTRUCTION

Armin Elmendorf, Winnetka, Ill.

Application December 30, 1938, Serial No. 248,439

7 Claims. (Cl. 108—9)

The present invention has for its primary object to produce, at a reasonable cost, a roof of the shingled type which will possess the desirable characteristics resulting from the use of asphalt strip shingles and, at the same time, be self-insulating against heat and cold, so as thereby to avoid the need of insulating materials aside from those materials required in the structure of the roof itself.

A futher object of the present invention is to produce a simple and novel shingle construction for roofs which will permit the resurfacing of a roof with simple and novel facing elements which may quickly and easily be applied over the old shingles and give to the roof the same appearance which it had when new.

A further object of the present invention is to provide the roof with complete weather resistance, including exclusion of drafts through both horizontal and vertical joints.

In carrying out my invention I overlay a framework composed of rafters and furring strips with fibrous insulation slabs as, for example, the material known as Celotex, arranged in shingle formation, excepting that there is only a short overlap between each slab and the next lower slab; a unique facing being then applied over these slabs. Therefore, viewed in one of its aspects, the present invention may be said to have for its object to produce a simple and novel roof construction in which slabs of fibrous insulating material are utilized as a sheathing over rafters or the like, and serve to provide a shingle-like contour which is subsequently provided with a wearing face.

The facing for the overlapping roof slabs preferably comprises mineral-surfaced roof felt in strips each of which is attached along one edge to a narrow strip of fibrous insulating material or wood; the felt overlying the edge strip, being bent downwardly past one edge of and underneath the latter, and being secured by means of little staples or other fastening means driven through the felt into the under side of the edge strip. The parts are so proportioned that when one of these facing members is laid upon a roof slab, with the edge strip abutting against the lower edge of the latter, the felt extends up to the lower edge of the next higher slab. By turning the felt back and nailing its edge strip to the underlying roof structure, then bringing the felt up and laying it flat upon the slab which it is to cover, and finally securing the upper end of the felt by driving nails through the same close to the upper edge, the roof slab is effectively covered and the joint between the same and the next lower slab is effectively sealed. When a facing member is applied to the next higher slab, the felt on the under side of its edge strip is in engagement with that part of the next lower facing member through which the nails were or are to be driven, and a seal is thus produced between the two separate pieces of felt. When, after many years, it is necessary or desirable to recondition a roof, a new set of facing members may be applied to the roof as it then is, just as in the first instance, facing members were applied to the bare overlapping slabs.

One of the objects of the present invention may therefore be said to be to produce a simple and novel element or device that may be applied over a shingled roof in the manner of a facing or sheathing which follows the contours of the shingles already there and by means of which the appearance which the roof had when new may be restored.

Further objects of the present invention are to provide simple and novel constructions at the valleys and eaves of roofs in which the foundations are composed of overlapping slabs of fibrous insulation material or the like.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of my invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawings, wherein:

Figure 1 is a perspective view of a fragment of a roof, illustrating two sections meeting in a valley; Fig. 2 is a perspective view on a larger scale than Fig. 1, illustrating a fragment of the roof at one of the eaves, and also illustrating the manner of applying a facing member in this location; Fig. 3 is a view which shows in perspective a fragment of the roof beginning with a vertical section parallel to one of the rafters inwardly from the roof edges; and Fig. 4 is a perspective view of one of the facing members.

Referring to the drawings, 1 represents any usual or suitable rafters across which extend furring strips 2 in the form of wood boards which may conveniently be ordinary boards one inch thick and six inches wide. Overlying the furring strips, and each somewhat wider than the distance between the near edges of adjacent furring strips, are slabs 3 of fibrous insulating material as, for example Celotex. In the case of slabs about eighteen inches wide, the thickness should be about one inch. The slabs may be of

any desired length but, for ease of handling, the length should not be too great. I believe that a length of six feet is satisfactory for most purposes.

Where the width of the slabs is about eighteen inches, the distance between the near edge of one furring strip and the far edge of the next furring strip is preferable a little less, so that when the upper edge of a slab is flush with the corresponding edge of an underlying furring strip, the lower end overlaps the next lower furring strip only about an inch or so. In laying the slabs on the roof framework, the course extending along the lower edge of the roof is laid first; the slabs of the next course being laid to overlap those of the first row sufficiently to permit nails, such as indicated at 4 in Fig. 3, to be driven through the two thicknesses of insulating material and into the underlying furring strip.

The under marginal portion of each slab along the upper edge may be bevelled slightly, as indicated at 5 in Fig. 3, so that the upper end of each slab rests on the underlying furring strip, across the entire width of the latter.

In the building of the roof, the slabs are all nailed down and thus give to the roof a shingled effect. It is only after this has been done that the weather resistant facing is applied. This facing is made in sections of any desired length. Each facing section or member comprises a strip 6 which is thinner than are the slabs 3, and which has a width of about two inches. The strips may be composed of wood or of the same material as the slabs, and they are thinner than the slabs by an amount equal to twice the thickness of the roofing felt which provides the surface that is exposed to the weather. The roofing felt is cut into sheets 7. One of the strips 6 is laid flat against each of the facing sheets along one of the long edges of the latter and is secured thereto by means of little staples 8, or other suitable fastening means driven through the felt and into the strip. The felt sheet is then folded around the edge of the strip and brought across the opposite face. The width of each piece of felt is such that when its strip is placed against the lower edge of one of the roof slabs with the side containing the staples or other fastenings facing downwardly, and the sheet is laid flat across the top of the strip and of the slab against which the strip abuts, the felt reaches up to the line of the lower edges of the slabs in the next higher row. However, before the felt sheet is swung up over the roof slab, nails, such as indicated at 9, are driven down through the edge strip 6 and through the underlying material into the furring strip below the same. Then, after the felt has been laid flat upon the roof slab, its upper end is securely fastened when the facing strips are applied to the next higher course of slabs, the nails through the edge strips associated with the last-mentioned facing members passing down through the marginal portions along the upper edges of the felt sheets overlying the lower course of slabs.

It will thus be seen that a very tight seal is produced along the horizontal joints in the roofing material, so that no water or air blasts can be driven through the same.

Since there are two thicknesses of felt between each of the strips 6 and the underlying slab, the thickness of these edge strips must be less than that of the slabs, so that the upper face of each edge strip will be flush with the upper face of the slab against which it abuts. Thus, where the slabs are an inch thick, and 90-lb. mineral surfaced roofing felt is employed, the two thicknesses of felt underneath each edge strip require that the edge strips be about three-quarters of an inch thick to provide room for the felt beneath the same.

The facing elements or members may be of any desired lengths. I have found that by making them about forty inches long, and allowing an overlap of four inches between members meeting end to end, they may be readily manufactured, shipped and handled, and give the roof an attractive appearance. In order to provide for the overlap at the meeting ends of the facing members, each edge strip is made shorter than the felt sheet with which it is asociated and, as shown in Fig. 4, extends from one end edge of the felt as far as it will go to the other end. In other words, if there is to be a four inch overlap, the edge pieces are made four inches shorter than the felts and are so connected to the latter that the felt projects four inches beyond one end of its edge strip. In assembling the facing members end to end, they are simply telescoped upon each other so that the edge strips abut against each other and a four-inch overlap of the felt occurs at each joint.

It will be seen that the edge of the edge strip 6 around which the felt is bent is rounded so as to avoid sharp corners, whereas the opposite edge may be square so as to abut against a square edge of a slab.

When it comes time to repair a roof by providing it with a new facing for exposure to the weather, it is unnecessary to disturb or remove any part of the roof or roofing material; but it may be refaced in the same manner that the bare roof slabs were originally faced. In other words, facing felts with edge strips thereon are simply applied over the old roof; each new edge strip abutting against the felt-covered rounded edge of one of the original edge pieces and being nailed to the roof in precisely the same manner as the latter. It is in order to permit this resurfacing or refacing of a roof that I prefer to employ fairly wide furring strips and to have the lower edge of each slab overlap the corresponding furring strip for only a short distance, thereby leaving room above the furring strip below the lower edge of a slab for two edge strips laid edge to edge.

The only difference between the facing members employed in a new construction and those intended for refacing an old roof is that in the latter the edges of the edge strips that abut against a shoulder in the roof are preferably concave, as shown at 10 in Fig. 4, so as to fit the rounded edges of the lower ends of the old shingles.

The facing members may conveniently be manufactured by first cutting the felt to the proper size, attaching the edge strips thereto, and then feeding them through a machine that heats the felt and bends it around the edge strips so as to place each facing member in the condition that it is to have when it subsequently forms a part of a roof structure. After leaving the bending machine, the facing members need only to become cool in order to be ready for shipment.

The pre-bending of the felt is advantageous because when the shingles are in place on a roof, they will all have neat rounded lower edges free from breaks or cracks in the felt as would be apt to occur if the shaping of the felt to the

edges of their edge pieces were required to be done at the time of building the roof. It is true that the felts must be swung back far enough to permit nails to be driven through their edge strips, in applying them to a roof, but this can be accomplished without danger of cracking or breaking the felt.

One of the features of my invention has to do with making the roofing weather-proof along the edges thereof, at the eaves. To this end, as shown in Fig. 2, the endmost roof slabs do not extend clear to the edges of the roof, but they abut against slab sections 11 each of which is as long as the width of one of the slabs 3, plus the width of one of the edge strips 6, has a width of a few inches, and a variable thickness such that the lower face rests flat upon one of the furring strips and upon a filler 12 overlying a rafter between this furring strip and the next lower one. Each of the pieces 11 may therefore be said to comprise a wedge-shaped part which rests upon a furring strip and a filling strip, together with a nose 13 that projects over the next lower strip but at such an elevation above the latter that the thin end of the next lower member 11, together with two thicknesses of felt, may be clamped between the same and the underlying furring strip. These end pieces may be made from the same material as the slabs, but are thoroughly saturated with asphalt. It will be seen that the edge strips of the facing members that end at the eaves must be cut off far enough inward from the edge of the felt to provide room for the noses 13. Furthermore, in order not to interfere with the application of the facing members, the members 11 should be applied after the corresponding facing members have been set in the position of the upper of the two facing members shown in Fig. 2.

Another problem in roof construction is to insure tight joints in the valleys between roof sections meeting at an angle to each other. As shown in Fig. 1, I form in each such valley a wooden trough 14 the interior of which I face with galvanized iron 15 or other suitable material. The shingles are left with square ends, as shown, and tightness of joints is secured by utilizing at the valley end of each course of singles an asphalt-saturated water-proofed piece, such as the piece 11, employed at the opposite end of the course. The trough in the valley must be made comparatively wide in order to accommodate the square ends of the shingles; but I am enabled, thereby, to reduce to a minimum the amount of work that need be done on the shingles along the valleys in order to produce a neat appearance and durable, tight joints.

I claim:

1. In a roof, a framework, slabs of fibrous insulating material laid in horizontal courses upon the framework, narrow marginal portions along the lower ends of the slabs in each course resting on narrow marginal portions at the upper ends of the slabs in the next lower course and having nails extending through the same and through the underlying course into the framework, stiff bar-like strips abutting against the lower edges of the slabs in each course, a layer of felt extending over the upper faces of the slabs in each course and the upper faces of the corresponding strips and continuing down past the lower edges of and underneath the strips; and nails extending through the strips, the two layers of felt under the same and the underlying slabs, into the framework.

2. In a roof, rafters, wide, transverse furring strips secured to the rafters, slabs of fibrous insulating material laid in horizontal courses on and fastened to the furring strips, the lower marginal portion of each course of slabs resting upon the upper marginal portion of the next lower course, a felt layer covering the entire exposed upper face of and continued in the plane of that face beyond the lower edge of each course of slabs where it turns down and then back toward the latter edge, a stiff strip embraced by that portion of the felt projecting beyond the lower edge of a course of slabs; and nails extending through each of said stiff strips and the underlying elements into the furring strips without passing through the felt that lies on top of the stiff strips.

3. In a roof, a framework, slabs of fibrous insulating material laid in horizontal courses upon the framework, the slabs in each course extending a short distance over the upper ends of the slabs in the next lower course, sheet felt lying loosely upon and covering the exposed upper faces of the slabs in each course; the lower marginal portion of the felt on each course projecting a short distance over the next lower course and then extending first downward and then rearward; nailing strips embraced by the projecting portions of the felt; and nails extending through the nailing strips and the parts underlying the same into the framework.

4. In a roof, a framework, slabs of fibrous insulating material laid in horizontal courses upon the framework, the slabs in each course extending a short distance over the upper ends of the slabs in the next lower course, sheet felt lying loosely upon and covering the exposed upper faces of the slabs in each course; the lower marginal portion of the felt on each course projecting a short distance over the next lower course and then extending first downward and then rearward; nailing strips embraced by the projecting portions of the felt; and nails extending through the nailing strips and the parts underlying the same into the framework, the felt in each course being in sections overlapping each other at their ends, while the nailing strips abut at their ends.

5. In a roof, rafters, wide, transverse furring strips secured to the rafters, flat slabs of fibrous insulating material arranged in courses upon said furring strips, the lower marginal portion of each course of slabs resting upon the upper marginal portion of the next lower course, a felt layer covering the entire exposed upper face of and continued in the plane of that face beyond the lower edge of each course of slabs where it turns down and then back toward the latter edge, a stiff nailing strip embraced by that portion of the felt projecting beyond the lower edge of a course of slabs; and nails extending through each of said stiff strips and the underlying elements into the furring strips without passing through the felt that lies on top of the stiff strips, the slabs and the nailing strips terminating a short distance from a side edge of the roof, and pieces of fibrous insulating material saturated with asphalt each filling the spaces between one of the slabs and the corresponding nailing strip and the edge of the roof.

6. A roof having two sections meeting in a valley, each section comprising rafters and horizontal furring strips, a trough member extending along the valley, slabs of fibrous insulating material laid in horizontal courses upon the

furring strips, the slabs in each course extending a short distance over the upper ends of the slabs in the next lower course, sheet felt lying loosely upon and covering the exposed upper faces of the slabs in each course; the lower marginal portion of the felt on each course projecting a short distance over the next lower course and then extending first downward and then rearward; nailing strips embraced by the projecting portions of the felt; nails extending through the nailing strips and the parts underlying the same into the framework; the felt in each roof section overlapping the adjacent side of the said trough, the slabs and the nailing strips terminating a few inches short of the edges of the felt in the said trough, and pieces of asphalt-saturated fibrous material each filling the space between the felt and the underlying side of the trough from the end of one of the slabs and the corresponding nailing strip.

7. In a roof, a supporting structure for a roof covering capable of securely holding nails driven into the same, slabs of soft fibrous insulating material laid in shingle formation in courses, overlapping only along narrow marginal portions, on and fastened to said structure, and sheets of felt overlying the exposed upper faces of the slabs, each sheet having a short section at the lower end projecting past the lower edge of the course which it covers and being at least partially wrapped about a nailing strip along its lower edge; and nails extending through each nailing strip, through the underlying portion of the sheet in which it is embraced, through the upper marginal portion of the course which it overlies, including the felt on the latter course, and into said structure; thereby causing the nailing strips along the lower edge of each course to clamp between the same and said structure two layers of felt and the upper marginal portion of the next lower course of slabs, and thus produce a sealed horizontal joint between the two courses of slabs.

ARMIN ELMENDORF.