

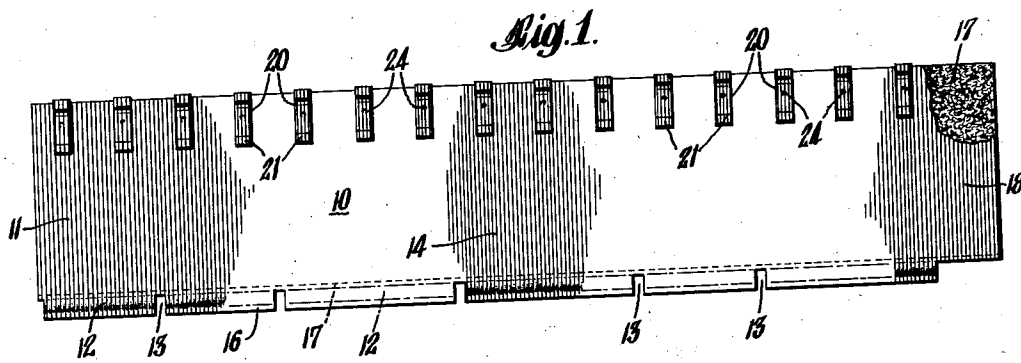
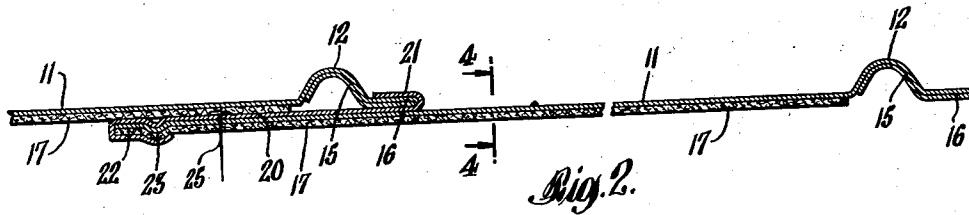
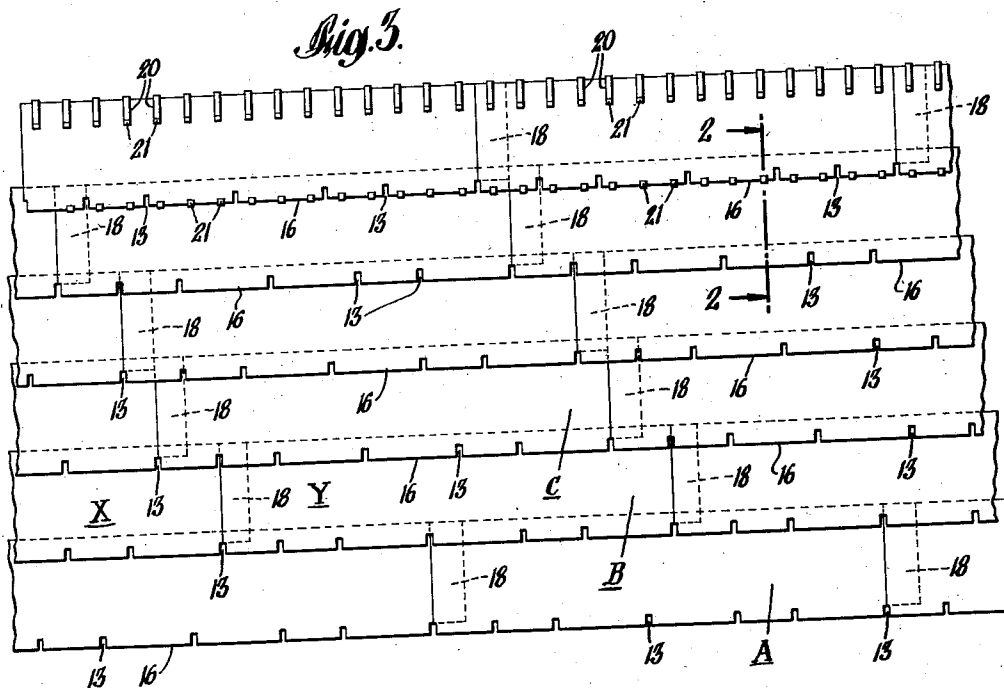
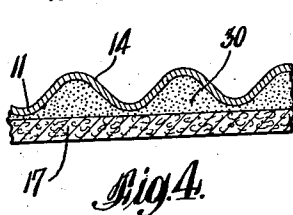
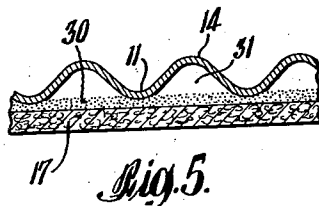
Oct. 29, 1940.

E. H. KOENIG

2,219,450

STRIP SHINGLE

Filed June 17, 1938



INVENTOR
EDWARD H. KOENIG.
BY
Albert M. Austin
ATTORNEY

Patented Oct. 29, 1940

2,219,450

UNITED STATES PATENT OFFICE

2,219,450

STRIP SHINGLE

Edward H. Koenig, West Orange, N. J., assignor to
The New Haven Copper Company, Seymour,
Conn., a corporation of Connecticut

Application June 17, 1938, Serial No. 214,185

2 Claims. (Cl. 108—17)

The invention relates to coverings for protecting exposed surfaces and, more particularly to covering elements sometimes known as strip shingles.

5 The invention relates to strip shingles of the type shown and claimed in Gutterman application Serial No. 123,110, filed January 30, 1937, now Patent No. 2,120,278. According to the prior application, the strip shingle comprises a thin, flat body adapted to lie flat against the underlying supporting surface. The lower or weather edge of the strip is provided with spaced notches and the material between these notches is bent to form upstanding flange or bead-like members. Such a strip shingle is very economical in covering a roof since it is only necessary for each course to overlie the next lower course only and not the lower course once removed as in the case of ordinary shingles.

20 When strip shingles of the above kind are made of extremely thin metal, even though corrugated, they become structurally quite soft and pliable so that they can be handled only with difficulty. It has been heretofore proposed to reinforce the lower toe roll and toe flange to reduce distortion due to the workmen stepping on them while working on the roof. According to the present invention, the flat body of the strip is efficiently reinforced and strengthened by providing an underlying lining of roofing paper or roofing felt adhesively secured to the under surface of the strip.

30 A further feature of the invention provides unequally spacing the notches in the lower edges of the strips to provide the effect of random widths of individual shingles. Because of the random positioning of the notches, the unsightly effect of diagonal rows of shingles on the roof may be avoided, even though the strips themselves may all be alike.

40 A still further feature of the invention is the spacing of the holddown clips and of the shingle notches in a predetermined manner so that the clips of any underlying course never fall opposite the notches of the overlying course.

45 The invention also consists in certain new and original features of construction and combination of parts hereinafter set forth and claimed.

50 Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, and the manner in which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawing forming a part thereof, in which

60 Fig. 1 is a plan view of a single strip according to the invention;

Fig. 2 is a section on the line 2—2 of Fig. 3 through two adjoining courses;

Fig. 3 is a plan view illustrating a series of adjoining courses with several strip shingles in each course;

Fig. 4 is a section on the line 4—4 of Fig. 2; and

Fig. 5 is a section corresponding to Fig. 4 showing a different manner of securing the metal and composition layers together.

10 In the following description and in the claims various details will be identified by specific names for convenience, but they are intended to be as generic in their application as the art will permit.

15 Like reference characters denote like parts in the several figures of the drawing.

20 In the drawing accompanying and forming part of this specification, certain specific disclosure of the invention is made for purposes of explanation, but it will be understood that the details may be modified in various respects without departure from the broad aspect of the invention.

25 Referring now to the drawing, each strip is indicated by 10 and comprises a flat body 11 made up of an upper layer of rolled sheet metal 14 and a lower layer of roofing paper or roofing felt 17. Each strip has a lateral extension 18 for underlying the next strip in the same course as is more fully explained hereinafter.

30 The metal sheet 14 may be plane, or corrugated, as illustrated in the drawing. The upper sheet 14 has at its lower weather edge a series of cut-out notches 13. Extending between these notches are upstanding flange members or toe rolls 12 formed by bending or pressing the rolled metal stock. The upstanding flanges 12 are further bent to form a series of toe flanges 16. The toe flanges 16 and toe rolls 12 may be strengthened by bending back a single layer of metal indicated by 15, or by folding back a plurality of layers, as explained more fully in the copending Farmer application above referred to.

35 The lower layer 17 is made of material known in the trade as roofing paper or roofing felt. This material is sold on the market in various grades and weights and comprises vegetable or animal fibers suitably felted together and impregnated with asphaltum, bitumen or other binding and waterproofing material. This roofing paper or roofing felt is waterproof and the material is similar to that used in the so-called composition shingles except that it has no coating of slate or stone particles. This material is cut to the proper length and width and is cemented to the under surface of the body 11 by any well-known sticky adhesive material. The paper or felt layer 17 runs the length of the strip except that in some cases it may not extend under the extension 18. In this event, the number of thicknesses is reduced when the extension 18 is lapped under the

adjacent strip. The paper or felt layer 17 runs in width from the upper edge of the metal strip to the notches 13.

If desired, the roofing felt 17 may also extend into the toe rolls 12 and toe flanges 16, thus strengthening the toe roll and toe flange. The felt strip might be cemented to a plane copper strip before corrugating and before forming the toe rolls or cutting the notches 13.

The adhesive material may be of any of the well-known roofing cements on the market capable of adhering both to the roofing paper and to the metal. For example, the cement may be of such consistency that it may be applied hot at a temperature of, say around 110°-115° C. and may be quite liquid at this temperature, becoming sticky and hard as it cools to ordinary temperature. The cement should have a sufficiently high melting point so as not to "run" or "bleed" when subjected to the hot sun on a roof and, at the same time, it should be sufficiently elastic when cold so as not to crack under winter temperatures.

It is preferred to have the layer of roofing felt 17 adhere very slightly to the metal 14. For example, the cement may be applied only in widely spaced streaks or daubs, the adherence being merely sufficient to hold the layers of felt and metal together during handling and laying. The clips 20 clamped around the upper edge of the strip, as described more in detail hereinafter, may serve to hold the upper edges of the felt and metal layers together. After the strips are laid on the roof, the nails and clips serve to hold the layers in proper relation as will hereinafter appear.

In other cases the cement may be applied substantially uniformly over the entire area of the felt layer 17, thus holding the layers of roofing felt and metal tenaciously together, making, in effect, a one-piece, comparatively stiff laminated strip. The cement may have considerable body, filling in the corrugations as indicated by 30 in Fig. 4, or the cement may be applied in such way that it adheres only to the crests of the corrugations, the bottoms of the corrugations being left empty, as indicated in Fig. 5.

In the case where the cement is applied uniformly to the felt and adheres only to the tops of the corrugations, as in Fig. 5, and in the case where the cement is applied only in spaced streaks or daubs, dead air spaces, indicated by 31 in Fig. 5, are obtained within the corrugations. These dead air spaces impart excellent insulating properties to the shingles against both cold and heat.

For holding down the weather edges of overlying courses, a series of clips, indicated by 20, are provided. These clips may be made of heavier metal than the metal of the strips. For example, the clips may be made of rolled copper having a weight of twelve ounces to the square foot before corrugating. The clips are made with a lower hook 21 and an upper hook 22. The clips are positioned over the upper edge of the strips, preferably in the factory. They are spaced the proper distance apart and in proper relation to the notches 13, as will be more completely explained hereinafter. The clips are attached by subjecting their upper ends to a squeezing pressure which indents them and the material of the strip shingle, as indicated at 23 in Fig. 2, interlocking these members together.

These indentations, indicated by 23, are sufficient to hold the clips firmly in place on the

roofing strip for all ordinary purposes so that, when the roofer applies a strip to the roof, the clips are already in their proper places. However, while handling or laying, in case some extraneous object accidentally catches onto the clip, the indentations 23 are not sufficiently deep to prevent disengagement of the clip from the strip. This disengaging action avoids tearing the thin metal which may be as thin as thin paper. The clips are marked with punch marks 24 for the roofing nails.

It will be noted that the notches 13 are variably spaced. This is for the purpose of providing the artistic effect of shingles of various widths. The spacing between notches 13 and the spacing between clips 20 and the relation between the clips and notches is such that, so long as any notch in any upper course is centered with respect to a pair of adjoining clips in the next lower course, the clips will not interfere with the notches throughout the length of the course. Thus, the clips are applied to the toe flanges 16 between the notches where they do the most good and the notches are not covered by the clips and are free to play their artistic role.

To obtain this desirable relation between the clips and notches, the clips are evenly spaced and the notches are spaced at variable distances which are multiples of the clip spacing. For example, the clips may be spaced three inches apart from center to center and the distance in inches between notch centers in Fig. 1, reading from left to right, may be 6-6-9-9-6-9.

To lay these strip shingles, after completing any lower row, indicated by A, the next row B is laid from left to right by engaging the toe flanges 16 under the hooks 21 of the clips 20 with the notches 13 of course B located between the clips 20 of course A. Nails will be driven through the clips 20 at the nail marks 24, the nails firmly holding down the clips and the upper margin of the strip shingle against the underlying supporting surface. The heavy metal of the clips 20 acts as a reinforcement to the nail heads. In laying the course B additional care must be taken that the strips themselves in course B are not exactly aligned with course A, in which case no staggering of the notches would be obtained.

After laying the first strip shingle, indicated by X, in course B, the next strip, indicated by Y, will fit over the lap extension 18 of the strip just laid, taking care to provide for notch 13 formed partly in each strip X and Y. The laying of succeeding strip shingles in course B and the laying of course C and the remaining courses will continue in the same manner.

When the roof is laid, it will be noted that the bodies 11 of the strip shingles lie flat against the supporting surface (not shown) and the toe rolls 12 stand up from the plane of the bodies 11 and toe flanges 16, providing the effect of thickness to the butt ends of the shingles and giving an illusion not unlike the ends of ordinary wooden or slate shingles. The combined thickness of both the metal layer 14 and roofing felt 17 is so small that, by itself, would not provide an effective shadow line usually associated with artistic roofs made up of wood shingles having thick butt ends.

The supporting surface may constitute 70 sheathing boards lying close together to form a continuous support. The board surface may be first covered with insulating paper or the strip shingles may be laid directly on the boards.

The thickness of the metal itself may run, for 75

example, around a few thousandths of an inch. For rolled copper, having a weight of three ounces to the square foot of uncorrugated stock, the thickness will run about four one-thousandths of an inch. The roofing paper may be of weights known in the trade as twelve or fifteen pound felt, running in thickness of around $\frac{1}{64}$ to $\frac{1}{32}$ of an inch. The thicknesses shown in the drawing are greatly exaggerated to bring out the construction. The number of corrugations in the metal may run four or five to the inch, the corrugations being so small and shallow that all parts of the bodies of the strips lie close to the supporting surface so that it is difficult for rain or wind to beat in under the strip shingles. The strips may run about four feet in length. Obviously, the above dimensions are illustrative only and may vary considerably.

Any desired metal or other material having suitable properties may be used for the upper layer 14. Copper is preferred on account of its excellent roofing qualities. In present commercial developments, to lower costs, it has been found desirable to use a very lightweight copper of the order of three or four ounces to the square foot of uncorrugated rolled stock. This metal is light, soft and easily bent and because of the length of the strips, when not strengthened with the lower layer, they are difficult to ship, handle and lay. The provision of the roofing paper or felt overcomes this disadvantage in an excellent manner. The roofing paper and the corrugations of the metal help stiffen the body of the strip and makes it much easier to handle when laying on the roof.

The roofing felt also helps prevent water from getting underneath the strip shingles. The layer of roofing felt acts as a safety cover in case the metal surface is accidentally punctured, this roofing paper or felt being waterproof. The lower layer also seals around the fastening nails 25. In addition, this underlying layer of roofing paper insulates the roof against heat and cold.

In effect, the composite strip of an upper layer of metal and a lower layer of composition waterproof material provides a double layer of shingles, an outer layer of fireproof metal shingles having a pleasing appearance and an under layer of heat insulating material, both layers being waterproof.

The random spacing of the notches 13 improves the artistic effect of the roof. Even though the strips are of identical manufacture, the effect of random widths of wooden, tile or other shingles is obtained. The undesirable diagonal lines of shingles obtained when the shingles are all of uniform width is also avoided. The multiple relation between notch spacings and clip spacings provides effective holddown action of the clips at all parts of the vulnerable weather edges without interfering with the illusion of separate shingles which the notches are intended to give. These advantages are illustrated particularly in Fig. 3.

It will be understood that a layer of felt roofing may be secured in the above-described manner to the under surface of any metal covering element. For example, it may be secured to the under surface of individual shingles of the type shown in Clapp application Serial No. 112,626, filed November 25, 1936 now Patent No. 2,142,177.

While certain novel features of the invention have been disclosed and are pointed out in annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. A covering for a roof or the like comprising a series of relatively long and narrow strip shingles adapted to be laid lengthwise across a supporting surface, each upper shingle overlapping the next preceding lower shingle but not the lower shingle once removed, each shingle comprising a substantially flat, two-ply body having a top layer of corrugated metal and a bottom layer of plane roofing fabric secured to said body, the corrugations of said metal being relatively small so that said entire body lies substantially close to and flat against said supporting surface, said roofing fabric bridging the corrugations to form dead air spaces between said layers, said metal also being bent at the weather edge to form an upstanding trough-shaped, flange-like toe roll and a toe flange, said corrugations extending transversely to the length of the strip and continuously across said body, said toe roll and toe flange, the upper margin of each shingle having a plurality of fastening clips secured thereto on the upper surface thereof and having hooks overlying the toe flanges of the overlying strips, and fastening nails passing through said clips and through the upper margins of the attached shingles into the supporting surface, said nails being located under the lower margins of the overlying shingles.
2. A covering for a roof or the like comprising a series of relatively long and narrow strip shingles adapted to be laid lengthwise across a supporting surface, each upper shingle overlapping the next preceding lower shingle but not the lower shingle once removed, each shingle comprising a substantially flat, two-ply body having a top layer of corrugated metal and a bottom layer of plane roofing felt secured to said body, the corrugations of said metal being relatively small so that said entire body lies substantially close to and flat against said supporting surface, said roofing felt bridging the corrugations to form dead air spaces between said layers, said metal also being bent at the weather edge to form an upstanding trough-shaped, flange-like toe roll and a toe flange, said corrugations extending transversely to the length of the strip and continuously across said body, said toe roll and toe flange, said toe rolls and flanges having recesses therein variably spaced to produce the effect of individual shingles of random widths, the upper margin of each shingle having a plurality of uniformly spaced fastening clips secured thereto on the upper surface thereof and having hooks overlying the toe flanges of the overlying shingles, the spacing of said recesses being multiples of the spacing of said clips to avoid interference between the clips and recesses irrespective of the random spacing of the recesses, and fastening nails passing through said clips and the upper margins of the attached shingles into the supporting surface, said nails being located under the lower margins of the overlying shingles.

EDWARD H. KOENIG.