Aug. 30, 1966 T. O. MARINI ETAL 3,269,075

ALUMINUM SHINGLE

Filed Nov. 8, 1963 2 Sheets-Sheet 1

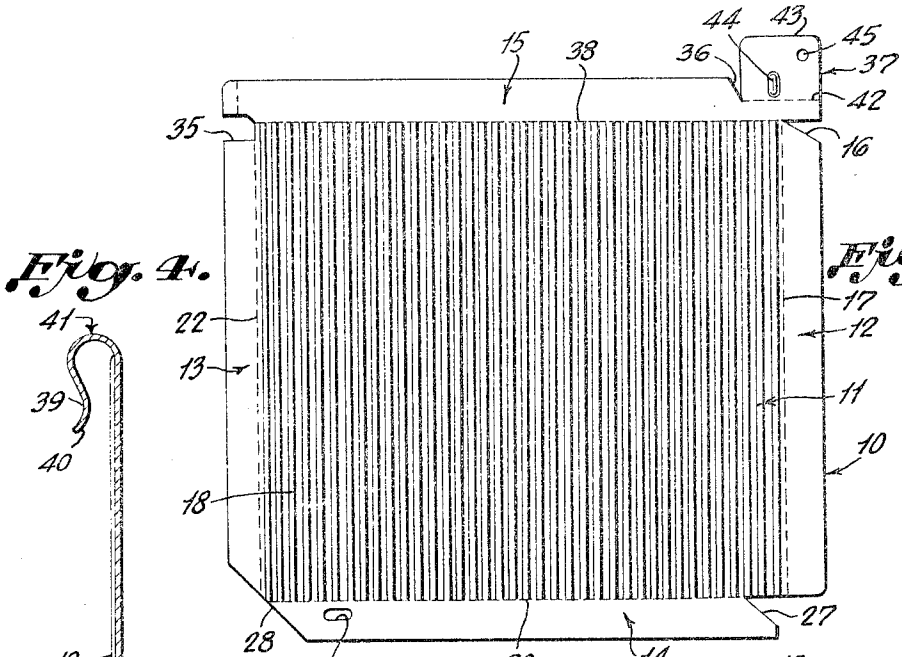

Fig. 1.

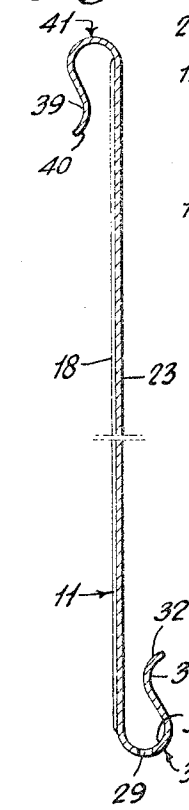

Fig. 4.

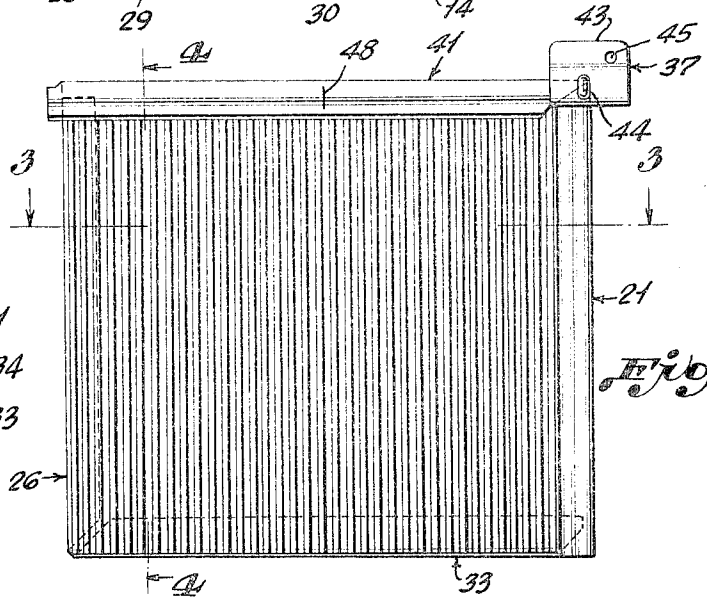

Fig. 2.

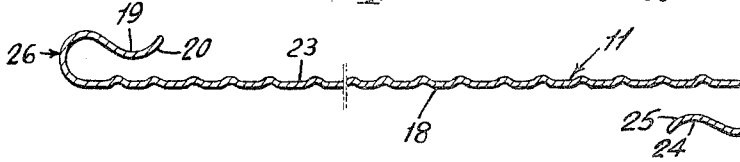

Fig. 3.

INVENTORS
THOMAS O. MARINI
LOUIS G. MARINI
BRYAN L. COSDEN

BY Hasseck, Downey & Seabold
ATTORNEYS

Aug. 30, 1966 T. O. MARINI ETAL 3,269,075

ALUMINUM SHINGLE

Filed Nov. 8, 1963

2 Sheets-Sheet 2

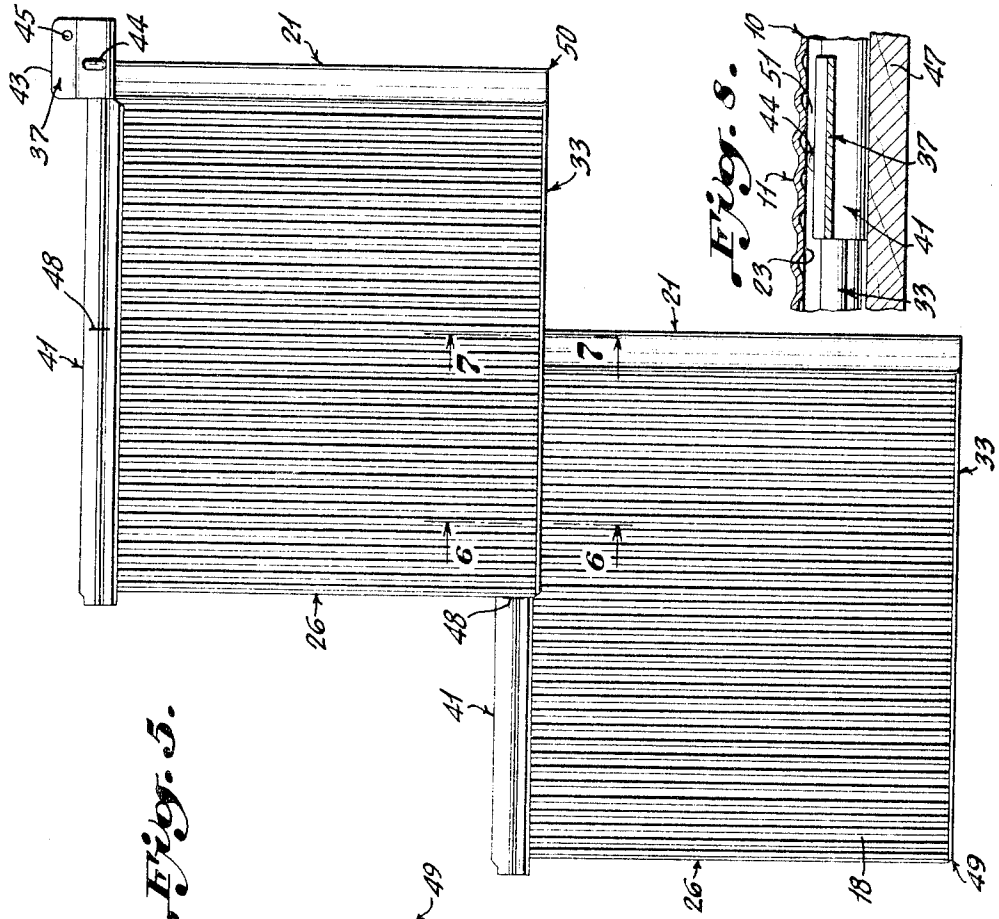

Fig. 5.

Fig. 8.

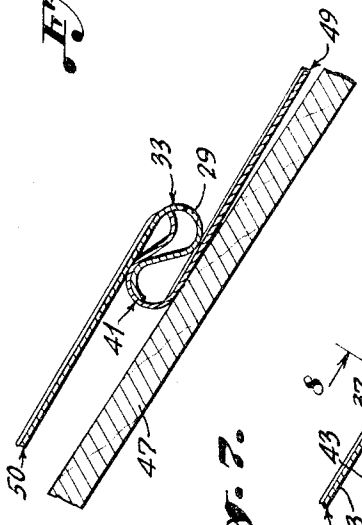

Fig. 6.

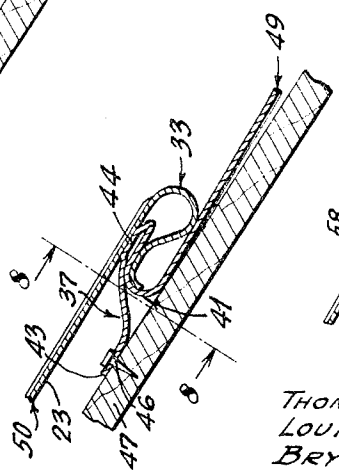

Fig. 7.

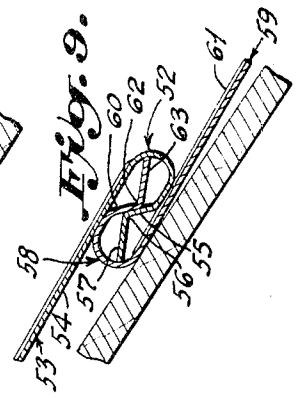

Fig. 9.

INVENTORS
THOMAS O. MARINI
LOUIS G. MARINI
BRYAN L. COSDEN

BY Glascock Downing & Seibold

ATTORNEYS

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ALUMINUM SHINGLE

Thomas O. Marini, Haddon Heights, and Louis G. Marini and Bryan L. Cosden, Moorestown, N.J.; said Thomas O. Marini and Louis G. Marini assignors to Bryan L. Cosden, Medford Lakes, N.J.

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3 Claims. (Cl. 52—522)

This invention relates to building materials and more particularly to an aluminum shingle to be intsalled on the roof of a building and is intended to provide an improvement over the shingle shown in the patent to Korter #2,631,552, issued March 17, 1953, and patent to Sunderhauf #2,568,469, issued September 18, 1951.

Numerous types of aluminum or metallic shingles have heretofore been proposed, but considerable difficulty has been experienced in making such shingles completely leakproof and particularly in preventing leakage due to moisture being blown up under the overlapping edges of the shingles and particularly at the upper edge of the joint or seam between two laterally adjacent shingles. Furthermore, since condensation tends to collect on the under surface of metallic shingles, some means must be provided for draining away such condensation to avoid the possibility of leakage thereof to the structure beneath the shingles and the structure shown in the Korter patent, identified above, illustrates one attempt which has been made to dispose of condensation moisture in a harmless manner. Some difficulty has also been experienced in laying prior art metallic shingles, in that no means was provided for ensuring that adjacent shingles were completely interlocked or no means for indicating to the workmen that the shingles were properly assembled when laying the same on a roof. This often resulted in the laying of shingles in which the joints therebetween were not completely closed, thereby presenting further possibilities of leakage, and also tending to destroy the uniform appearance of the shingles on a roof.

Another disadvantage which has been encountered in the use of metallic shingles of the type shown in the Korter patent is the lack of rigidity in the shingle, and the fact that only one nailing point is provided for each shingle which results in securing all of the shingles on a roof with relatively few nails. Due to the relative flexibility of the Korter shingle, which results from the fact that the length is approximately twice the width, and the relatively few nailing points, a high wind frequently rips these shingles from the roof.

The shingle of the present invention serves to overcome the disadvantages mentioned above and provides additional advantages when compared to prior metallic shingles in which the width is approximately twice the height, in that due to the provision of a shingle in which the width is substantially equal to the height there is less flutter and scalloping effect when subjected to high winds and furthermore, expansion and contraction as the result of temperature changes which takes place in each individual shingle is confined to a smaller area and is dissipated throughout the shorter perimeter of the lock means. This materially contributes to the elimination of noise due to expansion and contraction and also materially reduces the possibility of elongation of the nail holes and possible loosening of the nails due to such expansion and contraction. Also the smaller shingle of this invention results in the provision of more shadow lines on the roof thereby presenting a more pleasing appearance.

It is accordingly an object of this invention to provide an aluminum shingle having means to prevent leakage of windblown moisture upwardly between the joints of adjacent shingles and particularly at the upper end of the joint between laterally adjacent shingles.

A further object of the invention is the provision of an aluminum shingle having an integral fastening tab as a part thereof and in which such tab is formed in a manner to prevent leakage of windblown moisture upwardly between adjacent shingles at the upper end of the joint between laterally adjacent shingles.

A still further object of the invention is the provision of an aluminum shingle including means for collecting moisture condensing on the under surface of the shingle and for draining away such moisture in a harmless manner.

Another object of the invention is the provision of an aluminum shingle of rectangular formation and having interlocking seams along the side, bottom and top edges and with such seams being of the snap type to securely hold adjacent shingles in interlocking relationship and also to provide a definite, audible indication of the workman when the shingles are assembled in a manner to provide a leakproof seam or joint and with the shingles assembled in a manner to provide a uniform pleasing appearance.

A further object of the invention is the provision of an aluminum shingle having means in the form of a gutter along the underside of the lower edge to collect moisture condensing and flowing downwardly along the under surface of the shingle and in which means is provided to space the adjacent upper shingle a slight distance above the surface of the adjacent lower shingle in order to permit free flow of condensation moisture along the lower surface of the shingle into the gutter in which a drain opening is provided to drain away such moisture in a harmless manner.

Another object of the invention is the provision of an aluminum shingle in which the length is approximately equal to the width, thereby providing a substantially square shingle having relatively great rigidity, and further providing approximately twice the number of nailing points for a given area when compared to conventional aluminum shingles.

A further object of the invention is the provision of an aluminum shingle which is substantially smaller in area than a conventional aluminum shingle thereby resulting in less flutter and scalloping effect when subjected to high winds.

A still further object of the invention is the provision of an aluminum shingle which is substantially smaller in area than a conventional aluminum shingle thereby confining expansion and contraction due to changes in temperature to a smaller area when compared to conventional aluminum shingles which materially contributes to the elimination of noise, as well as materially reducing the possibility of elongation of the nail holes or loosening of the nails.

Another object of the invention is the provision of an aluminum shingle which is substantially smaller in area than a conventional aluminum shingle thereby providing a greater number of shadow lines on the roof which serves to present a more pleasing appearance.

A still further object of the invention is the provision of an aluminum shingle which may be conveniently and economically manufactured from sheet aluminum material by relatively simple, stamping, cutting and bending or folding operations.

Further objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a plan view of a blank from which the shingle of this invention is formed and shows such blank after stamping and cutting, but prior to the bending or folding operations for forming the joint portions on the side, top and bottom edges;

FIG. 2 a plan view similar to FIG. 1, but showing the completed shingle;

FIG. 3 a sectional view taken substantially on the line 3—3 of FIG. 2 and showing the formation of the joints at the side edges, as well as the corrugation pattern of the main portion of the shingle;

FIG. 4 a sectional view taken substantially on the line 4—4 of FIG. 2 and showing the formation of the joints at the upper and lower edges of the shingle;

FIG. 5 a plan view showing two shingles constructed in accordance with this invention and in the relative position occupied when laid on a roof;

FIG. 6 a fragmentary sectional view taken substantially on the line 6—6 of FIG. 5 and showing the snap-type interlocking joint between two courses of shingles and also showing the position of the drain opening in the gutter at the lower edge of the shingle;

FIG. 7 a fragmentary sectional view taken substantially on the line 7—7 of FIG. 5 and showing the manner in which the lower surface of an upper shingle is spaced slightly above the joint portion of the next lower shingle in order to permit a drainage of condensation moisture along the under surface of the upper shingle into the gutter at the lower edge thereof;

FIG. 8 a sectional view taken substantially on the line 8—8 of FIG. 7 and further showing the manner of spacing the upper shingle from the lower shingle to permit drainage of condensation moisture; and

FIG. 9 a fragmentary sectional view similar to FIG. 6, but showing a slightly modified form of snap-type interlocking joint.

With continued reference to the drawings and particularly FIG. 1, there is shown a blank **10** from which the shingle of this invention is constructed and such blank **10** may well be formed by suitable stamping and cutting operations from a sheet of aluminum or other suitable metallic material and as shown in FIG. 1, the blank **10** is generally rectangular in configuration and the central portion **11** thereof is corrugated in substantially the same manner as the shingle shown in the Sunderhauf patent, identified above, and such corrugations may, if desired, simulate the appearance of a wood shingle. Also as clearly shown in FIG. 1, the corrugated central portion **11** of the blank **10** terminates inwardly of the side edges to provide plain side edge portions **12** and **13**, a plain lower edge portion **14** and a plain upper edge portion **15**. A generally V-shaped notch **16** is provided in the side edge portion **12** adjacent the upper end thereof and as best shown in FIGS. 1, 2 and 3, the side edge portion is folded over along the line **17** to overlie the upper surface **18** of the central portion **11** and the folded over, reversely bent side portion **12** extends toward the upper surface **18** of the central portion **11** and merges into a smooth curve **24** adjacent the upper surface **18** and thereafter extends away from the upper surface **18** to provide a camming portion **25** and the smooth curved portion **24**, as well as the camming portion **25** serve to provide one part **26** of a snap-type interlocking seam, the purpose and operation of which will be later described.

In a similar manner, the side edge portion **13** is folded or reversely bent along the line **22** to underlie the lower surface **23** of the central portion **11** and as clearly shown in FIG. 3, the reversely bent portion **13** extends toward the underside **23** of the central portion **11** and merges into a smooth curved portion **19** adjacent the under surface **23** and thereafter extends away from such under surface to provide a camming portion **20** thereby providing one part **21** of a snap-type interlocking seam, the purpose and operation of which will be later described.

A generally V-shaped notch **27** is provided adjacent one end of the lower edge portion **14** and the opposite end of the lower edge portion **14** is cut on a bevel, as shown at **28**. Also provided in the lower edge portion **14** is an aperture **29**, the purpose of which will be later described. The lower edge portion **14** is folded or

reversely bent along the line **30** to underlie the lower side **23** of the central portion **11** and as shown in FIG. 4, the reversely bent lower edge portion **14** extends toward the lower surface **23** and merges into a smooth curved portion **31** adjacent the lower surface **23** and thereafter extends away from the lower surface **23** to provide a cam portion **32**. The curved portion **31**, together with the cam portion **32** form one part **33** of a snap-type interlocking seam and also serve to provide a gutter **34** at the lower underside of the sheet or shingle **10** and the aperture **29** provides a drain for the gutter **34**.

At the end of upper edge portion **15** adjacent the side edge portion **13** is a generally rectangular notch **35** and inwardly of the opposite end of upper edge portion **15** is a generally V-shaped notch **36**. Outwardly of the V-shaped notch **36** and forming an extension of a portion of the upper edge **15** is a generally rectangular fastening tab **37**. Upper edge portion **15**, together with the fastening tab **37** are folded or reversely bent along the line **38** to overlie the upper surface **18** of the central portion **11** and as shown in FIG. 4, the reversely bent upper edge portion **15** extends toward the upper surface **11** to a smooth curved portion **39** adjacent the upper surface **18** and thereafter extends away from such surface to provide a camming portion **40**. The reversely bent upper edge portion **15**, together with the curved portion **39** and the camming portion **40** provide one part of a snap-type interlocking seam **41**.

As best shown in FIGS. 2 and 7, the fastening tab **37** is reversely bent along the line **42** in such a manner that the upper edge **43** of the fastening tab **37** is disposed inwardly beyond the edge of the interlocking seam portion **41** and also as shown in FIG. 2, the fastening tab **37** projects laterally beyond the side interlocking seam portion **21** and also as clearly shown in FIG. 2, the reversely bent fastening tab **37** serves to close the upper end of the channel formed by the interlocking seam portion **21** to prevent leakage of moisture with a protuberance **44** on the upper face thereof, the purpose of which will be presently described and also, if desired, the fastening tab **37** may be provided with an aperture **45** for receiving a nail or other suitable fastening means. If desired, the aperture **45** may be omitted and a nail driven directly through the material of the fastening tab **37**. FIG. 7 shows the manner in which a nail **46** is driven through the aperture **45** in the fastening tab **37** and into a roof structure **47** to secure the shingle thereto.

As best shown in FIGS. 5, 6, 7 and 8, the shingles of this invention are laid on a roof in the usual pattern and in order to provide for proper location of the shingles a die mark **48** may be provided on the upper interlocking seam portion **41** and this mark is utilized in a manner to be now described. The shingles are laid on courses from the lower edge of the roof upwardly as is common practice and as shown in FIGS. 5 and 7, a lower shingle **49** which is a part of a lower course of shingles is laid on the roof and secured thereto by the nail **46** extending through the aperture **45** of the fastening tab **37** and into the roof structure **47**. It is, of course, understood that laterally adjacent shingles are secured to one another by interlocking of the adjacent side edge seam portions **21** and **26**. An upper shingle **50** which is part of a second course of shingles interlocked together by the side beam portions **21** and **26** is laid on the roof with the side edge seam portion **26** in alignment with the die mark **48** and with the lower interlocking seam portion **33** of the upper shingle **50** interlocking with the upper interlocking seam portion **41** of the lower shingle **49**. As clearly shown in FIGS. 7 and 8, the protuberance **44** on the upper base of the fastening tab **37** engages the lower surface **23** of the upper shingle **50** to space such lower surface **23** above the adjacent upper surface of the upper interlocking seam portion **41** thereby providing a drainage space **51** between the upper surface of the upper seam portion **41** and the lower surface **23** of the upper shingle **50**. In this manner, moisture condens-

ing on lower surface 23 of the upper shingle 50 may flow downwardly therealong and into the gutter 34 formed by the lower interlocking seam portion 33 on the upper shingle 50 and such moisture may flow along the gutter 34 and out through the drain opening or aperture 29 and on the upper surface 18 of the lower shingle 49. This serves to dispose of condensation moisture and as described above, the reversely bent fastening tab 37 closes any opening occurring at the upper end of the side interlocking seam portion 21 and also any opening occurring at this point between laterally adjacent shingles and, therefore, any possibility of moisture blowing upwardly through an opening at this point is prevented, thereby assuring a dry roof structure.

A slightly modified form of snap-type interlocking seam to be utilized between adjacent shingles is shown in FIG. 9 and as shown therein, a lower interlocking seam portion 52 is formed by the reversely bent lower edge of the shingle 53 which extends toward the lower surface 54 of the shingle 53 along a straight line, as shown at 55, and extends to a point 56 adjacent the lower surface 54 and thereafter away from such surface in a straight line and at an angle to provide a camming portion 57. The upper interlocking seam portion 58 of a lower shingle 50 is provided in the same manner with a portion 60 extending in a straight line toward the upper surface 61 of the lower shingle 59 to a point 62 adjacent the upper surface 61 and thereafter extending away from such surface at an angle in a straight line to provide a camming portion 63. The shingles provided with this modified form of interlocking seam are utilized and laid in the same manner as the shingles described above.

The interlocking seam portions operate by engaging the adjacent camming portions to spread the seam portions apart thereby permitting the same to move together with a snap-action which serves to securely interlock the shingles together and at the same time, provides an audible signal due to the snap-action which indicates to the workmen that the shingles are properly assembled.

It is to be noted that the shingle of this invention is approximately square, with the actual dimensions being of the order of nine and three quarters inches long and eight and three quarters inches wide. This serves to provide a shingle having relatively great rigidity, particularly when compared to conventional aluminum shingle of the Korter type in which the dimensions are eighteen inches long and nine and one-half inches wide.

While it is necessary to utilize a greater number of shingles of the present invention to cover a given area when compared to the Korter shingle, this disadvantage is overcome by the provision of twice the number of nailing points for a given area which together with the increased rigidity mentioned above, provides a roof capable of withstanding high wind velocities.

The above described aluminum shingle is relatively simple and economical to construct and may be conveniently and rapidly laid to provide a weather-tight roof of pleasing appearance having a pronounced shadow line between adjacent course and also serving to dispose of condensation moisture in a harmless manner and, at the same time, prevent the entry of windblown moisture beneath the shingles and into the roof structure.

It will be obvious to those skilled in the art that various changes may be made in the invention without departing from the spirit and scope thereof and therefore the invention is not limited by that which is shown in the drawings and described in the specifications, but only as indicated in the appended claims.

What is claimed is:

1. An aluminum shingle of rectangular shape, said shingle comprising a sheet of metal with one side edge reversely bent to overlie the upper face of said sheet and the opposite side edge reversely bent to underlie the lower face of said sheet to provide means for interlocking laterally adjacent shingles, the lower edge of said sheet being reversely bent to underlie the lower face of said sheet to provide means for interlocking said shingle with the adjacent lower shingle and to provide a gutter for receiving moisture, the lower wall of said gutter having an aperture therein adjacent one end for draining moisture from said gutter, the upper edge of said sheet being reversely bent to overlie the upper face of said sheet to provide means for interlocking said shingle with the adjacent upper shingle and an integral fastening tab at the upper corner of said sheet adjacent said one side edge, said tab comprising an extension of said reversely bent upper edge projecting outwardly of the adjacent reversely bent side edge, said extension overlying the upper end of the adjacent reversely bent side edge to close the upper end of the channel formed thereby to prevent upward flow of moisture to the underside of said shingle, a portion of said extension being bent upwardly in the opposite direction of, and along a bend which is parallel to, said reversely bent upper edge to project up beyond said reversely bent upper edge, and a small protuberance on the upper face of said tab and overlaying said reversely bent upper edge for engaging the lower face of the adjacent upper shingle to space the same from the upper face of the adjacent reversely bent upper edge to permit moisture to flow downwardly along the lower face of the adjacent upper shingle and into said gutter.

2. An aluminum shingle of rectangular shape, said shingle comprising a sheet of metal with one side edge reversely bent to overlie the upper face of said sheet and the opposite side edge reversely bent to underlie the lower face of said sheet to provide means for interlocking laterally adjacent shingles, the lower edge of said sheet being reversely bent to underlie the lower face of said sheet to provide means for interlocking said shingle with the adjacent lower shingle, the upper edge of said sheet being reversely bent to overlie the upper face of said sheet to provide means for interlocking said shingle with the adjacent upper shingle and an integral fastening tab at the upper corner of said sheet adjacent said one side edge, said tab comprising an extension of said reversely bent upper edge projecting outwardly of the adjacent reversely bent side edge, said extension overlying the upper end of the adjacent reversely bent side edge to close the upper end of the channel formed thereby to prevent upward flow of moisture to the underside of said shingle, and a portion of said extension being bent upwardly in the opposite direction of, and along a bend which is parallel to, said reversely bent upper edge to project up beyond said reversely bent upper edge.

3. An aluminum shingle as defined in claim 2, in which at least said lower and upper edges of said reversely bent edges extend toward and to an abrupt bend line parallel to its edge and adjacent the face of said sheet and thereafter extend away from said sheet at an angle to provide a camming portion for engaging a similar camming portion on adjacent shingles, the angle between the portion extending toward said face and the portion extending away from said face providing a relatively sharp ridge at said abrupt bend line to provide a snap-type interlocking seam with the adjacent shingles.

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FRANK L. ABBOTT, *Primary Examiner.*

RICHARD W. COOKE, JR., *Examiner.*

L. R. RADANOVIC, A. C. PERHAM,

Assistant Examiners.