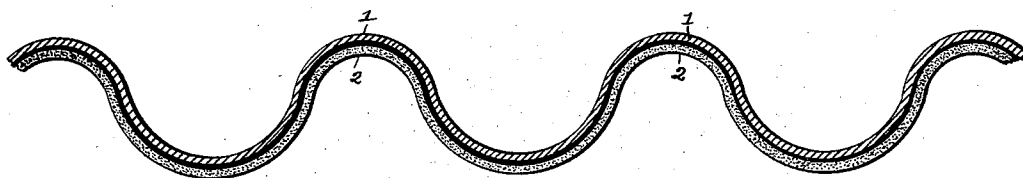


(No Model.)

A. E. KRAUSE & G. ENGEL.
ROOFING PLATE.

No. 540,992.

Patented June 11, 1895.



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ARTHUR ERNEST KRAUSE, OF JERSEY CITY, NEW JERSEY, AND GODFREY ENGEL, OF SOUTH BALTIMORE, MARYLAND.

ROOFING-PLATE.

SPECIFICATION forming part of Letters Patent No. 540,992, dated June 11, 1895.

Application filed May 4, 1894. Serial No. 510,108. (No model.)

To all whom it may concern:

Be it known that we, ARTHUR ERNEST KRAUSE, residing at Jersey City, county of Hudson, and State of New Jersey, and GODFREY ENGEL, residing at South Baltimore, county of Anne Arundel, and State of Maryland, citizens of the United States, have invented certain new and useful Improvements in Roofing-Plates, of which the following is a specification.

Our invention relates to improvements in metallic plates used in the construction of the roofs, walls, ceilings, partitions, or similar portions of buildings or other structures of a like nature, and commonly called roofing plates. Such plates are usually formed from thin sheet metal, corrugated, embossed, or otherwise indented to give stiffness to the plates; and these plates are secured to or overlap one another so as to form a continuous surface. In the use of metal roofs or walls, however, some difficulty has been experienced, where the roof or wall has been composed simply of metal plates such as described, owing to condensation of moisture on the surface of the metal, or "sweating," as it is commonly termed. The presence of this moisture tends to facilitate corrosion of the metal, while it renders those parts of the building near the walls very damp. Moreover, the moisture frequently collects in sufficient quantities to drop down and injure articles in the building. Trouble has likewise been experienced with such metal roofs and walls owing to the fact that the surface of the metal being smooth and hard, plaster and similar decorative substances do not adhere readily thereto.

To prevent the condensation of moisture on the surface of the metal, it has been proposed to provide the metal plates with a coating of non-conducting material, such as felt, mortar, or other cement; but such coverings are objectionable. Felt and similar substances are subject to decay, which is hastened by exposure to moisture and to heat, and is combustible, so that a fire in the building, though slight, may necessitate the entire reroofing of the building. Coatings like mortar or cement, while fire-proof, are unyielding, and are cracked and broken up by the expansion and contraction of the metal which is inevitable

with changes of temperature, so that such coatings flake off and the metal is left bare. Such coatings therefore are short lived, and are not satisfactory.

The objects of our invention are, first, to provide a non-conducting coating for the surface of metallic roofing plates which shall be permanent in its character, being unaffected by decay, by exposure to the elements, or by changes of temperature, and which shall be sufficiently flexible so as not to flake off from the surface of the metal, and, second, to provide a suitable means for attaching this coating to the metal. Our invention consists in the novel character of the coating applied to the metal plate, and in the novel means employed for securing the coating to the plate.

We have found that the objects of our invention can best be attained by coating the surfaces of the metal plates with one or more layers of asbestos cloth or paper, which is non-combustible, is not subject to decay, is not affected by exposure to the elements or by changes of temperature, and which is an excellent insulator of heat. Asbestos coatings for metallic roofing plates have been suggested before, but it has always been proposed to apply the asbestos to the metal in a finely divided state and mixed with mortar or cement so as to form an asbestos mortar. Coatings so formed have not sufficient cohesion and flexibility, and flake off, leaving the surface of the metal exposed; but if the asbestos be applied to the metal in the form of asbestos cloth or paper, then the asbestos coating itself possesses sufficient cohesion and flexibility to adapt itself to expansion, compression, or bending of the metal surface to which it is secured; and such a coating is as enduring as the metal to which it is attached, and is at all times equally effective. Moreover, the asbestos, particularly if rough, forms an admirable surface for receiving plaster or similar coverings, which because of the intervention of the asbestos, are not so likely to flake as when applied to the surface of the metal itself. This asbestos cloth or paper we secure to the metal by cementing it directly thereto. It is important that the cement used shall be strong, permanent, not affected by moisture or heat, incombustible, and suffi-

ciently flexible to permit of bending of the metal. For this purpose we have found the best cement to be sodium silicate, commonly known as "water-glass;" but we do not limit ourselves to the use of any particular kind of cement.

In carrying out our invention, it is not necessary nor in fact is it intended to apply the asbestos coating to the roofing plates while or after they are being put in place upon the building, though this may be done; but the metal plates are prepared in sizes and shapes convenient for handling, and the asbestos coating cemented to each plate, so that the plates so prepared may be shipped to the desired point and put in place upon the building as quickly and readily as would be the case with uncoated plates.

In the drawing which accompanies and forms a part of this application, the figure there shown illustrates a corrugated roofing-plate embodying our invention.

This plate consists of a metal roofing plate, 1, of ordinary size, thickness, material, and construction, to which is secured by cement a layer 2 of asbestos cloth or paper. The asbestos may be cemented to the surfaces of plates of irregular contour, but it is preferable to cement the asbestos to flat plates and then corrugate, emboss, or otherwise indent the plates so prepared to the desired shape.

The surface to which the layer of asbestos is to be secured is first covered with the cement, and the asbestos cloth or paper is then laid upon the cemented surface, and pressed down thereupon. The plate is then rolled or pressed to the desired shape, and this may be done before the cement is dry, the pressure necessary to such operations tending to secure the asbestos yet more firmly to the metal. The asbestos coating, when so applied, becomes practically a part of the metal; and because of the flexible nature of the asbestos coating, bending, contraction, or expansion of the metal will not cause the asbestos layer to break or to flake off, the coating being permanent. The roofing plates so made are ready for use, and may be used exactly as the common uncoated roofing plates are used. Adjacent

plates may be connected together by overlapping their edges, in the usual manner, or in any other suitable and common manner.

We do not limit ourselves to any particular method of joining the plates.

The asbestos layer applied to our roofing plates forms an excellent surface for the application of plaster or similar coverings, since the asbestos used may if desired be very soft and porous and have a rough surface. Acting as it does as a support for the plaster, it prevents the plaster from flaking off if the plate be bent so as to crack the plaster.

We may likewise apply asbestos coatings, in the manner described in this application, to the stamped or embossed metal plates now frequently used for walls and ceilings of buildings, and this we regard as being within the scope of our invention, the term roofing plates being used as a generic term covering all plates of this character used in the construction of the roofs, walls, and ceilings of buildings.

Having thus completely described our invention, what we claim, and desire to secure by Letters Patent, is—

1. As an article of manufacture, the herein described roofing plate, comprising a metal roofing plate having cemented to one side by a fire-proof and water-proof cement a layer of coherent and flexible fire-proof and heat-insulating material, substantially as described.

2. As an article of manufacture, the herein described roofing plate, comprising a metal roofing plate having cemented to one side by a fire-proof and water-proof cement a layer of coherent and flexible asbestos, substantially as described.

3. As an article of manufacture, the herein described roofing plate, comprising a metal roofing plate having a coherent and flexible layer of asbestos cemented thereto by sodium silicate, substantially as described.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

ARTHUR ERNEST KRAUSE.
GODFREY ENGEL.

In presence of—

CHAUNCEY P. OVERFIELD,
THOS. B. DIXON.