I. MILLS, Jr.

Cement-Roof.

No. 163,938. Patented June 1, 1875.

Fig. 1.

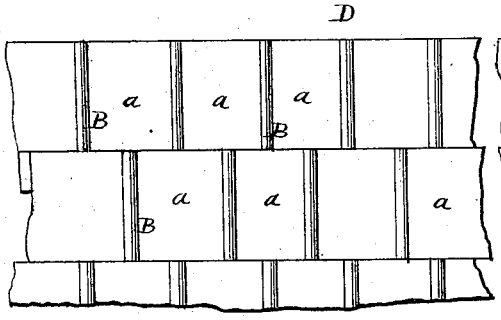


Fig. 3.

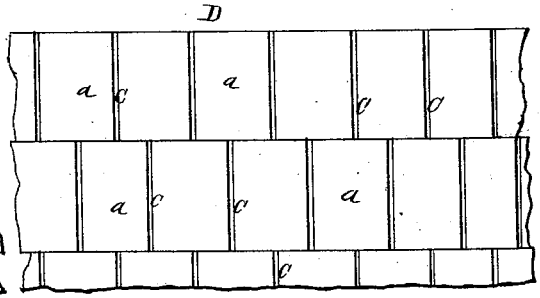


Fig. 2.

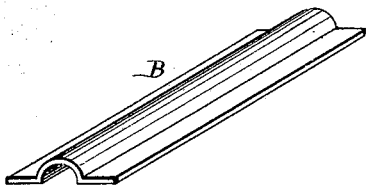
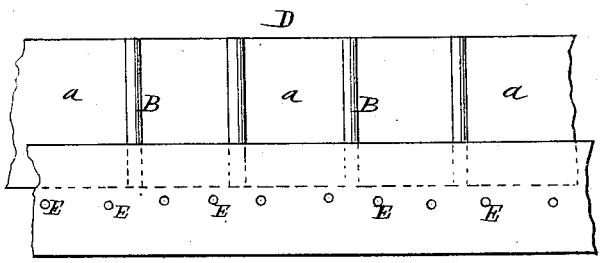


Fig. 4.



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UNITED STATES PATENT OFFICE.

ISAAC MILLS, JR., OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN CEMENT ROOFS.

Specification forming part of Letters Patent No. **163,938**, dated June 1, 1875; application filed March 25, 1875.

To all whom it may concern:

Be it known that I, ISAAC MILLS, Jr., of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented an Improvement in Cement Roofs, of which the following is a specification:

The object of my invention is to make a cement roof that will not crack with the contraction or expansion caused by the change of weather.

Cement placed upon a roof where it is exposed to all kinds of weather will soon crack; consequently it will leak. To overcome this difficulty, I have discovered that hydraulic cement, by itself, or with sand or artificial stone, can be used while in a plastic state, by putting it on in sections of not less than one foot square, the size of the sections to be regulated by the size of the roof. These sections are to be put on in rows along the roof, leaving a space between each section of one-fourth to one-half an inch. This enables the cement to contract or expand without cracking.

The sections are made not less than one-fourth of an inch in thickness at the lower side, and are made to taper toward the upper side to an edge, so that the next row of sections will lap neatly. The thickness of the section is regulated by the weight of the roof desired. The weather-space between the sections is covered by a piece of fluting made circular or V-shaped, of some light non-corrosive metal, such as copper, zinc, lead, or galvanized iron, with a small flange on each side. This fluting is made from one-half of an inch to one and a half inches in width, and as long as the sections used. When the sections are laid on, the fluting is pressed into the cement while it is soft. The flanges sink down so that the cement comes up over them. It readily adheres and becomes solid. This fluting will conform to the contraction or expansion of the sections.

The sections of cement are fastened in their place by nails in sufficient numbers, according to the size of the sections, which are driven into the sheeting-boards, leaving the head and a portion of the nail standing up, sufficient to hold the sections. The cement is then put over these nails and forms around them, making a perfect and secure fastening.

A roof is prepared for the cement by first covering with sheeting-boards, over which a layer of tarred or greased paper, pasteboard, or other similar waterproof material is laid. This forms a bed. The tarred or greased paper prevents the water in the cement from drawing or warping the sheeting-boards.

The sections are laid so as to lap one row on the next lower, and so as to either break the joints or have a continuous weather-space.

Figure 1 represents a portion of a roof with two rows of sections, *a*, with fluting B over the weather-space C. Fig. 2 represents a perspective view of a piece of fluting, B. Fig. 3 represents two sections, *a a*, showing the weather-space C uncovered. Fig. 4 represents a portion of roof D, with the nails E, by which the sections *a* are fastened.

a represents a section of the hydraulic cement, which is made not less than one foot square and not less than one-fourth of an inch in thickness at the lower side and tapering to an edge on the upper side. This is done to enable lapping of the sections *a* on each other. The size and thickness of the sections *a* are regulated by the size of the roof to be covered. The sections *a* are laid in rows along, beginning along the eave and lapping the rows as they go up. Between the sections *a* in the row, a weather-space, C, is left to permit contraction or expansion. This weather-space C is covered by a piece of fluting, B, made of light non-corrosive metal, such as copper, zinc, lead, or galvanized iron, in either a circular or V shape, having a small flange on each side. This gives the cement a hold. The cement readily adheres to the metal. The fluting B is made from one-half to one and a half inches wide and long enough to cover the weather-space C, which is governed by the size of the sections *a*. The roof D is prepared with sheeting-boards, over which tarred or greased paper, pasteboard, or other similar water-proof material is placed. Into this the nails E are driven so as to leave the head and a portion of the nail E out. On this the section *a* is placed while in a plastic state. The cement forms down around the nails E, and

when it sets forms a perfect fastening. This gives us a cement roof that is durable, fireproof, and that will not crack by heat and cold.

I claim as my invention—

The application of cement while in a plastic state to roofs, in sections *a*, with the weather-space C, fluting B, and the fastening by means of nails E, substantially as and for the purpose hereinbefore set forth.

In testimony that I claim the foregoing as my own invention, I affix my signature in presence of witnesses.

ISAAC MILLS, JR.

Witnesses:
W. J. PRENTICE,
JOHN DAVIS,
WILLIAM F. ROBB.